



# Sadakathullah Appa College

\*An Autonomous Institution, Re-Accredited by NAAC at an 'A' Grade, \*ISO 9001 : 2018 Certified\*

## CRITERION III

### RESEARCH, INNOVATION AND EXTENSION

#### 3.7.1. Collaborative Activities

(2020 - 2021)

*Submitted to*

THE NATIONAL ASSESSMENT AND ACCREDITATION COUNCIL (NAAC)

August 2022





# Sadakathullah Appa College

\* An Autonomous Institution, Re-Accredited by NAAC at an 'A' Grade, \* ISO 9001: 2015 Certified \*

## CRITERION III

### RESEARCH, INNOVATION AND EXTENSION

#### 3.7.1. Collaborative Activities

3.7.1 Number of Collaborative Activities Per year for research/faculty exchange/student exchange/internship/on-the-job training/project work	
2020-21	852

Principal


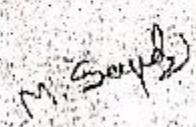
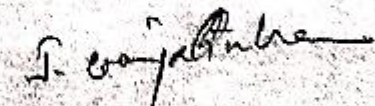
PRINCIPAL  
SADAKATHULLAH APPA COLLEGE  
Rahmath Nagar, TIRUNELVELI - 627 011.








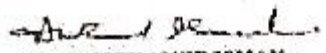

**Sadakathullah Appa College (Autonomous)**  
Rahmath Nagar, Tirunelveli - 627011

1	Name of the Faculty with Designation, Staff ID	: Dr. J. Ubaiyathulla Asst. Professor of Arabic ATAR01
2	Name of the Collaborating Faculty with Designation	: Mr. M. SEYID ABDUL KADHER Asst. Professor and Head, Department of Arabic, HKRH College, Uthamapalayam-625 533
3	Name of the Collaborating Organization	: HKRH College Uthamapalayam-625 533
4	Nature of Collaboration (Academic / Research / Faculty Exchange / Student Exchange / Project / Internship / On-the Job Training)	: Academic
5	Nature / Details of Outcome (Guest Lecture / DC member / Co-guide / Project Reports / Other Reports/Publications)	: BoS Subject Expert - UG Arabic
6	Period of Collaboration	: From : 27.12.2018 To: 26.12.2020
7	Financial Involvement (if any)	: Nil
8	Proof Attached	: Yes
Signature of Principal		Signature of the Collaborating Faculty
		
		Signature of the Faculty
		





**Sadakathullah Appa College (Autonomous)**  
Rahmath Nagar, Tirunelveli - 627011

1	Name of the Faculty with Designation, Staff ID	: Dr. S.A. Mohamed Rafeek Asst. Professor of Arabic ATAR02
2	Name of the Collaborating Faculty with Designation	: Dr. A.MOHAMED ISMAIL Asst. Professor and Research Supervisor, P.G.& Research Department of Arabic, Jamal Mohamed College, Trichy-620 020
3	Name of the Collaborating Organization	: Manonmaniam Sundaranar University, Abishekappati, Tirunelveli- 627 012
4	Nature of Collaboration (Academic / Research / Faculty Exchange / Student Exchange / Project / Internship / On-the Job Training)	: Academic
5	Nature / Details of Outcome (Guest Lecture / DC member / Co-guide / Project Reports / Other Reports/Publications)	: BoS Member - UG Arabic
6	Period of Collaboration	: From : 01.09.2019 To: 01.09.2021
7	Financial Involvement (if any)	: Nil
8	Proof Attached	: Yes
Signature of Principal		Signature of the Collaborating Faculty
		 <b>Dr. A. MOHAMED ISMAIL,</b> M.A., M.Phil., Ph.D., Assistant Professor P.G. & Research Department of Arabic Jamal Mohamed College (Autonomous) Trichirappalli - 620020
		Signature of the Faculty
		





## Sadakathullah Appa College (Autonomous)

Rahmath Nagar, Tirunelveli - 627011

1	Name of the Faculty with Designation, Staff ID	:	<b>Dr.S.M.A. Syed Mohamed Khaja , STCO01</b>
			<b>Assistant Professor and Head,</b>
			<b>Department of Commerce</b>
			<b>Sadakathullah Appa College(Autonomous),</b>
			<b>Tirunelveli</b>
2	Name of the Collaborating Faculty with Designation	:	<b>Dr.T.S.Subbulakshmi</b>
			<b>Assistant Professor, Department of Commerce,</b>
			<b>Sri Parama Kalyani College, Alwarkurichi</b>
3	Name of the Collaborating Organization	:	<b>Sri Parama Kalyani College, Alwarkurichi</b>
4	Nature of Collaboration (Academic / Research / Faculty Exchange / Student Exchange / Project / Internship / On-the Job Training)	:	<b>Research</b>
5	Nature / Details of Outcome (Guest Lecture / DC member / Co-guide / Project Reports / Other Reports/Publications)	:	<b>Co-guide</b>
6	Period of Collaboration	:	<b>From : 10.01.2018</b> <span style="float: right;"><b>To: 10.01.2021</b></span>
7	Financial Involvement (if any)	:	
8	Proof Attached	:	<b>Yes</b>
Signature of Principal		Signature of the Collaborating Faculty	Signature of the Faculty
		Dr. T. Subbulakshmi	



DR. K. SENTHAMARAI KANNAN

DIRECTOR

REF : MSU/RES/R1/JANUARY2018

Date : January 10, 2018

## Ph.D., Programme Commencement Order

To

ULAGAMMAL V  
53, SHAPA GARDEN, ANATYARKULAM,, PERUMALPURAM  
Tamil Nadu, Thirunelveli, Pincode - 627007  
Mobile No. : 9942280465, Email ID : ulagammalv1980@gmail.com

Sir/Madam,

Sub: Registration for doing Ph.D., programme - Date of Commencement of Research work -  
Intimation - Reg

Ref: Counseling attended by the candidate.

\*\*\*\*\*

With reference to the above, you are provisionally registered for Ph.D., Programme as detailed below :

- |  |   |
|--|---|
| 1. Name of the Scholar                 | : ULAGAMMAL V   |
| 2. Registration No.                    | : 18121191012004  |
| 3. Discipline                          | : Commerce  |
| 4. Gender                              | : Female  |
| 5. Social Category (Community)         | : BC  |
| 6. Nationality                         | : INDIAN  |
| 7. PWD Status                          | : Not Applicable  |
| 8. Admission Based On                  | : M.Phil  |
| 9. Name of the Supervisor              | : Dr. T.S. SUBBULAKSHMI   |
| 10. Name of the Co-Supervisor          | : DR. S M A SYED MOHAMED KHAJA  |
| 11. Mode                               | : PART TIME INTERNAL  |
| 12. Research Centre                    | : Sacakathuliah Appa College, Tirunelveli.  |
| 13. Date of Commencement               | : 10.01.2018  |
| 14. Proposed Title                     | : A study on job satisfaction and organizational citizenship behaviour among school teachers in Tirunelveli district  |
| 15. Doctoral Committee Members Details | : 1. DR. R. SIVASANKARI<br>Assistant Professor, Department of Commerce, Sri Paramakalyani College, Alwarkurichi<br>Mobile No. : 9952692560, Email ID : sankarispkc@gmail.com<br>2. DR. E. ANGEL SARAL ROSE<br>Assistant Professor, Department of Commerce, Sarah Tucker College, Palyamkottai<br>Mobile No. : 8608764431, Email ID : angeljeff.rose1982@gmail.com |

10.1.18  
ASST

10/1/18  
SUPDT

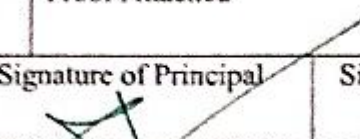
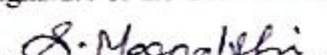

10/1/18  
AR

K. Senthamarai Kannan  
10/1/18  
DIRECTOR





**Sadakathullah Appa College**  
**(Autonomous)**  
Rahmath Nagar, Tirunelveli - 627011

1	Name of the Faculty with Designation, Staff ID	:	<b>Dr.S.M.A. Syed Mohamed Khaja , STCO01</b> Assistant Professor and Head, Department of Commerce Sadakathullah Appa College(Autonomous), Tirunelveli
2	Name of the Collaborating Faculty with Designation	:	<b>Dr.S.M.Sreebongga Meenakshi</b> Assistant Professor, Department of Commerce Manonmaniam Sundaranar University, Tirunelveli
3	Name of the Collaborating Organization	:	S.T.Hindu College, Nagercoil
4	Nature of Collaboration (Academic / Research / Faculty Exchange / Student Exchange / Project / Internship / On-the Job Training)	:	<b>Research</b>
5	Nature / Details of Outcome (Guest Lecture / DC member / Co-guide / Project Reports / Other Reports/Publications)	:	<b>DC Member</b>
6	Period of Collaboration	:	<b>From : 03.09.2019 To:03.09.2022</b>
7	Financial Involvement (if any)	:	
8	Proof Attached	:	<b>Yes</b>
Signature of Principal		Signature of the Collaborating Faculty	
			
		Signature of the Faculty	
			



# MANONMANIAM SUNDARANAR UNIVERSITY

Accredited with 'A' Grade by NAAC (3rd Cycle)

CENTRE FOR RESEARCH

ABISHEKAPATTI, TIRUNELVELI - 627 012, TAMILNADU, INDIA

Phone : 0462 - 2313741, 9487907000, Intercom: 2563073, Mail: cfrmsu@msuniv.ac.in, web: msuniv.ac.in



**DR. K. SENTHAMARAI KANNAN**  
DIRECTOR

REF : MSU/RES/Admiv/July 2019

Date : September 3, 2019

## Ph.D., Programme Commencement Order

To

MARIMUTHUSAMY. M  
1-55 D, MARIAMMAN KOVIL STREET, THIRUMALAPURAM, RAMANATHAPURAM, SIVAGIRI TALUK  
Tirunelveli, Tamil Nadu, Pincode - 627760  
Mobile No. : 9688192683, Email ID : venketmms@gmail.com

Sir/Madam,

Sub: Registration for doing Ph.D., programme - Date of Commencement of Research work -  
Intimation - Reg

Ref: Counseling attended by the candidate for July 2019 session.

\*\*\*\*\*

With reference to the above, you are provisionally registered for Ph.D., Programme as detailed below :

Name of the Scholar	MARIMUTHUSAMY. M
Registration No.	19223151011014
Discipline	Commerce
Gender / Community	Male / MBC/DNC
Nationality	INDIAN
PWD Status	Not Applicable
Admission Based On / Mode	M.Phil / PART TIME
Research Centre	S.T. Hindu College, Nagercoil
Name of the Supervisor with Address	Dr. S. M. Srirangameenakshi, Assistant Professor Department of Commerce, Manonmaniam Sundaranar University, Tirunelveli, 627751 Mobile No. : 8220714217, Email ID : langayahoo@gmail.com
Name of the Co-Supervisor with Address	Dr. K. V. Soundarajan, Associate Professor, Department of Commerce, S. T. Hindu College, Nagercoil Mobile No. : 9486203311, Email ID : soundarkv19@gmail.com
Doctoral Committee Members	1. DR SMA SYED MOHAMED KHAJA, Assistant Professor, Department of Commerce, Sadakathullah appa college, Tirunelveli-627001 Mobile No. : 9843252600, Email ID : smakkhaja@gmail.com  2. DR J MAHIL KAMALAM, Assistant Professor, Department of Commerce, Women's christian college, Nagercoil Mobile No. : 9600618416, Email ID : mahilkamalam@rediffmail.com
Proposed Title	Study on analysis of customer preference and satisfaction on E-Commerce platforms in India with special reference to Tirunelveli District
Date of Commencement	03.09.2019





# Sadakathullah Appa College (Autonomous)

Rahmath Nagar, Tirunelveli - 627011

1	Name of the Faculty with Designation, Staff ID	:	<b>Dr.S.M.A. Syed Mohamed Khaja , STCO01</b> Assistant Professor and Head, Department of Commerce Sadakathullah Appa College(Autonomous), Tirunelveli
2	Name of the Collaborating Faculty with Designation	:	<b>Dr P Abraham</b> Assistant Professor , Department of Commerce , ST. John's College, Palayamkottai, Tirunelveli
3	Name of the Collaborating Organization	:	St. John's College , Palayamkottai, Tirunelveli
4	Nature of Collaboration (Academic / Research / Faculty Exchange / Student Exchange / Project / Internship / On-the Job Training)	:	<b>Research</b>
5	Nature / Details of Outcome (Guest Lecture / DC member / Co-guide / Project Reports / Other Reports/Publications)	:	<b>DC member</b>
6	Period of Collaboration	:	From : 05.07.2018 To: 05.07.2021
7	Financial Involvement (if any)	:	
8	Proof Attached	:	Yes
Signature of Principal		Signature of the Collaborating Faculty	Signature of the Faculty
		Dr. P. Abraham	



Dr.K.SENTHAMARAI KANNAN  
DIRECTOR

REF:MSU/RES/R1/JULY 2018

Date : 05-July-2018

**Ph.D., Programme Commencement Order**

To

MARIA KALAI SELVI A  
9/18H-1, AMBAI ROAD 5TH STREET, ALANGULAM

Thirunelveli Tamil Nadu 627851  
Mobile No :9788740946 ,Email Id :selvi.alm@gmail.com

Sir/Madam,

Sub: Registration for doing Ph.D., programme - Date of Commencement of Research work - Intimation-Reg

Ref: Counseling attended by the candidate.

\*\*\*\*\*

With reference to the above, you are provisionally registered for Ph.D., Programme as detailed below :

- |  |   |
|--|---|
| 1. Name of the Scholar                   | : MARIA KALAI SELVI A   |
| 2. Registration No                       | : 18221271012018  |
| 3. Discipline                            | : Commerce  |
| 4. Gender                                | : Female  |
| 5. Social Category (Community)           | : BC  |
| 6. Nationality                           | : INDIAN  |
| 7. PWD Status                            | : Not Applicable  |
| 8. Admission Based On                    | : M.Phil  |
| 9. Name of the Supervisor                | : DR P ABRAHAM  |
| 10 Name of the Co-Supervisor             | : NIL   |
| 11 Mode                                  | : PART TIME INTERNAL  |
| 12 Research Centre                       | : ST. JOHN'S COLLEGE, PALAYAMKOTTAI   |
| 13 Date of Commencement                  | : 05.07.2018  |
| 14 Proposed Title                        | : A STUDY ON COMMERCE EDUCATION AND ITS IMPACT ON<br>ENTREPRENEURSHIP DEVELOPMENT IN TIRUNELVELI DISTRICT   |
| 15 Doctoral Committee<br>Members Details | : 1. DR A STANLEY DAVIS MANI<br>ASSISTANT PROFESSOR IN COMMERCE, ST. JOHN'S COLLEGE, TIRUNELVELI<br><br>2. DR SMA SYED MOHAMED KHAJA<br>HEAD & ASSISTANT PROFESSOR, DEPARTMENT OF COMMERCE,<br>SADAKUTHULLA APPA COLLEGE, TIRUNELVELI |

ASSISTANT

SUPERINTENDENT


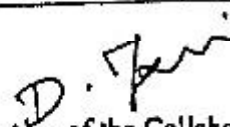
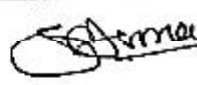
ASSISTANT REGISTRAR

DIRECTOR





**Sadakatullah Appa College (Autonomous)**  
Rahmath Nagar, Tirunelveli - 627011

1	Name of the Faculty with Designation, Staff ID	:	<u>Dr. K. Hema</u> Assistant Prof. of English Staff ID: ATEN04
2	Name of the Collaborating Faculty with Designation	:	<u>Dr. D. Jockim</u> Assistant Prof. of English
3	Name of the Collaborating Organization	:	<u>St. Xavier's College</u> <u>Palayamkottai, Tirunelveli</u>
4	Nature of Collaboration (Academic / Research / Faculty Exchange / Student Exchange / Project / Internship / On-the Job Training)	:	<u>Research</u>
5	Nature / Details of Outcome (Guest Lecture / DC member / Co-guide / Project Reports / Other Reports/Publications)	:	<u>DC Member for</u> <u>M. Maryl Chrisho</u> <u>Reg. No. 17211284012019</u>
6	Period of Collaboration	:	<u>From: 10-8-17</u> <u>To: 28-07-2021</u>
7	Financial Involvement (if any)	:	<u>—</u>
8	Proof Attached	:	<u>Yes / No</u>
 Signature of Principal		 Signature of the Collaborating Faculty <b>Dr. D. JOCKIM</b>	
		 Signature of the Faculty	

Assistant Professor of English  
St. Xavier's College (Autonomous)  
Palayamkottai, Tirunelveli-2



3.7.1/Collaborative Activities/2020-21/6  
**MANONMANIAM SUNDARANAR UNIVERSITY**  
**CENTRE FOR RESEARCH**  
 ABISHEKAPATTI, TIRUNELVELI - 627 012, TAMILNADU, INDIA



**DR. K. SENTHAMARAI KANNAN**  
**DIRECTOR**

REF : MSU/RES/R1/JUNE2017

Date : August 10, 2017

**Ph.D., Programme Commencement Order**

To

MARYL CHRISHO. M  
 67 SIVAN SOUTH CAR STREET, PALAYAMKOTTAI  
 Tamil Nadu, Thirunelveli, Pincode - 627002  
 Mobile No. : 7829006336, Email ID : xavierchrish30@gmail.com

Sir/Madam,

Sub: Registration for doing Ph.D., programme - Date of Commencement of Research work -  
 Intimation - Reg

Ref: Counselling attended by the candidate.

\*\*\*\*\*

With reference to the above, you are provisionally registered for Ph.D., Programme as detailed below :

- |   |   |
|---|---|
| 1. Name of the Scholar                    | : MARYL CHRISHO. M  |
| 2. Registration No.                       | : 17211284012019  |
| 3. Discipline                             | : English   |
| 4. Gender                                 | : Female  |
| 5. Social Category (Community)            | : BC  |
| 6. Nationality                            | : INDIAN  |
| 7. PWD Status                             | : Not Applicable  |
| 8. Admission Based On                     | : M.Phil  |
| 9. Name of the Supervisor                 | : DR D JOCKIM   |
| 10. Name of the Co-Supervisor             | : NIL   |
| 11. Mode                                  | : FULL TIME   |
| 12. Research Centre                       | : St. Xavier's College (Autonomous), Palayamkottai  |
| 13. Date of Commencement                  | : 10.08.2017  |
| 14. Proposed Title                        | : RECONSTRUCTING INDIA'S PAST A POST COLONIAL READING OF<br>NAYANTARA SAHGAL'S SELECT NOVELS  |
| 15. Doctoral Committee<br>Members Details | : 1. DR K HEMA<br>Assistant Professor of English, Sadakthaulah Appa College,<br>Tirunelveli.<br>Mobile No. : 9486379448, Email ID :<br>hemaselvan11@gmail.com<br>2. DR V CHRISTOPHER RAMESH<br>Assistant Professor of English,, Govt. Arts College, Melur,<br>Madurai.<br>Mobile No. : 9443008570, Email ID :<br>vchristopherramesh@gmail.com |

10.8.17  
 ASST

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 SUPDT

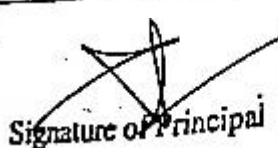
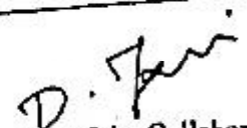
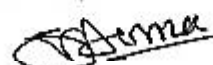
10/8/17  
 AR

10/08/17  
 DIRECTOR





**Sadakathullah Appa College (Autonomous)**  
Rahmath Nagar, Tirunelveli - 627011

1	Name of the Faculty with Designation, Staff ID	Dr. K. Hema Assistant Prof. of English Staff ID: ATEN04
2	Name of the Collaborating Faculty with Designation	Dr. D. Jockim Assistant Prof. of English
3	Name of the Collaborating Organization	St. Xavier's College, Palayamkottai, Tirunelveli
4	Nature of Collaboration (Academic / Research / Faculty Exchange / Student Exchange / Project / Internship / On-the Job Training)	Research
5	Nature / Details of Outcome (Guest Lecture / DC member / Co-guide / Project Reports / Other Reports/Publications)	DC Member for S. Rajkumaran Reg. No. 17221284011025 From: 10.08.2017 To: 10.5.2021
6	Period of Collaboration	
7	Financial Involvement (if any)	—
8	Proof Attached	Yes / No
 Signature of the Principal		 Signature of the Collaborating Faculty Dr. D. JOCKIM Assistant Professor of English St. Xavier's College (Autonomous) Palayamkottai, Tirunelveli-2
		 Signature of the Faculty



MSU PhD Admission 17221284011025  
3.7.1/Collaborative Activities/2020-21/7  
**MANONMANIAM SUNDARANAR UNIVERSITY**  
**CENTRE FOR RESEARCH**  
ABISHEKAPATTI, TIRUNELVELI - 627 012, TAMILNADU, INDIA



**DR. K. SENTHAMARAI KANNAN**  
**DIRECTOR**

REF : MSU/RES/R1/JUNE2017

Date : August 10, 2017

**Ph.D., Programme Commencement Order**

To

RAJKUMARAN S  
19-1 PTR Nagar, Palayamkottai Road  
Tiruchendur  
Tamil Nadu, Thoothukudi, Pincode - 628215  
Mobile No. : 8870252038, Email ID : rajkumaranncc@gmail.com

Sir/Madam,

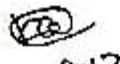
Sub: Registration for doing Ph.D., programme - Date of Commencement of Research work -  
Intimation - Reg

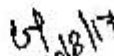
Ref: Counseling attended by the candidate.


\*\*\*\*\*


With reference to the above, you are provisionally registered for Ph.D., Programme as detailed below :

1. Name of the Scholar : RAJKUMARAN S
2. Registration No. : 17221284011025
3. Discipline : English
4. Gender : Male
5. Social Category (Community) : BC
6. Nationality : INDIAN
7. PWD Status : Not Applicable
8. Admission Based On : M.Phil
9. Name of the Supervisor : DR D JOCKIM
10. Name of the Co-Supervisor : NIL
11. Mode : PART TIME INTERNAL
12. Research Centre : St. Xavier's College (Autonomous), Palayamkottai
13. Date of Commencement : 10.08.2017
14. Proposed Title : SOCIO - CULTURAL DISCOURSE IN J. M. COETZEE SELECT NOVELS
15. Doctoral Committee Members Details :
  1. DR K HEMA  
Assistant Professor, Department of English, Sadakathullah Appa College  
Mobile No. : 9486379448, Email ID : hemaselvan@gmail.com
  2. DR V CHRISTOPHER RAMESH  
Assistant Professor, Department of English, Govt. Arts College, Melur.  
Mobile No. : 9443008570, Email ID :  
vcristopherramesh@gmail.com

  
10-8-17  
ASST

  
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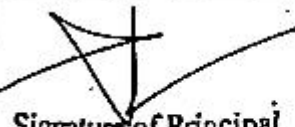
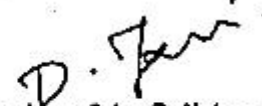
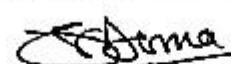
  
10/8/17  
AR

  
10/8/17  
DIRECTOR





**Sadakathullah Appa College (Autonomous)**  
Rahmath Nagar, Tirunelveli - 627011

1	Name of the Faculty with Designation, Staff ID	:	<u>Dr. K. Hema</u> Assistant Prof. of English Staff ID : ATEN04
2	Name of the Collaborating Faculty with Designation	:	<u>Dr. D. Jockim</u> Assistant Prof. of English
3	Name of the Collaborating Organization	:	St. Xavier's College Palayamkottai, Tirunelveli.
4	Nature of Collaboration (Academic / Research / Faculty Exchange / Student Exchange / Project / Internship / On-the Job Training)	:	Research
5	Nature / Details of Outcome (Guest Lecture / DC member / Co-guide / Project Reports / Other Reports/Publications)	:	DC Member for C. Mothilal Dinesh Reg No: 17221284011034
6	Period of Collaboration	:	From: 10.8.2017 To: 10.5.2021
7	Financial Involvement (if any)	:	—
8	Proof Attached	:	Yes / No
 Signature of Principal		 Signature of the Collaborating Faculty Dr. D. JOCKIM Assistant Professor of English	
		 Signature of the Faculty	



**Sadakathullah Appa College (Autonomous)**  
Rahmath Nagar, Tirunelveli - 627011


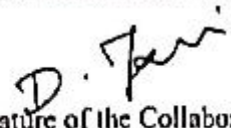

1	Name of the Faculty with Designation, Staff ID	:	Dr. K. Hema, Assistant Prof. of English Staff ID: ATEN04
2	Name of the Collaborating Faculty with Designation	:	Dr. D. Jockim Assistant Prof. of English
3	Name of the Collaborating Organization	:	St. Xavier's College Palayamkottai, Tirunelveli
4	Nature of Collaboration (Academic / Research / Faculty Exchange / Student Exchange / Project / Internship / On-the Job Training)	:	Research
5	Nature / Details of Outcome (Guest Lecture / DC member / Co-guide / Project Reports / Other Reports/Publications)	:	DC Member for S. Venkata Subramanian Reg. No: 20211284011013
6	Period of Collaboration	:	From: 30.12.2020 To: till date
7	Financial Involvement (if any)	:	—
8	Proof Attached	:	Yes / No <input checked="" type="checkbox"/> Yes
Signature of Principal		Signature of the Collaborating Faculty Dr. D. JOCKIM	
		Signature of the Faculty	

Assistant Professor of English  
St. Xavier's College (Autonomous)  
Palayamkottai, Tirunelveli-2





Sadakathullah Appa College (Autonomous)  
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5	Nature / Details of Outcome (Guest Lecture / DC member / Co-guide / Project Reports / Other Reports/Publications)	DC Member for S. Ignatius Richard Reg. No: 202211284011016
6	Period of Collaboration	From: 30.12.2020 To: till date
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8	Proof Attached	Yes / No ✓
 Signature of Principal		 Signature of the Collaborating Faculty Dr. D. JOCKIM Assistant Professor of English St. Xavier's College (Autonomous) Palayamkottai, Tirunelveli-2
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**C. KANNAN**  
DIRECTOR

3.7.1/Collaborative Activities/2020-21/10

REF: MSU/RES/Admin/July 2020 Session

Date : December 30, 20

**Ph.D., Programme Commencement Order**



To  
**S IGNATIUS RICHARD**  
272, DARLING NAGAR, MAHARAJA NAGAR POST  
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Sir/Madam,

Sub: Registration for doing Ph.D., programme - Date of Commencement of Research work -  
Intimation - reg.

Ref: Counselling attended by the candidate for July 2020 session.

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Name of the Scholar	<b>S IGNATIUS RICHARD</b>
Registration No.	<b>20221284011016</b>
Discipline	English
Gender & Community	Male & BC
Nationality	INDIAN
IWD Status	Not Applicable
Admission Based On & Mode	PG & PART TIME
Research Centre	St. Xaviers College (Autonomous), Tirunelveli
Name of the Supervisor with Address	<b>Dr. D. Jockim, Assistant Professor</b> Department of English, St. Xavier's College (Autonomous), Palayamkottai, 627002 Mobile No. : 9994657296, Email ID : d.jockim@gmail.com
Name of the Co-Supervisor with Address	NIL
Doctoral Committee Members	1. <b>DR LIZIE WILLIAMS</b> , Assistant Professor, Department of English, St Xavlers College, Palayamkottai-627002 Mobile No. : 7708052024, Email ID : liziewilliams@gmail.com 2. <b>DR K HEMA</b> , Assistant Professor, Department of English, Sadakathullah Appa College, Palayamkottai-627002 Mobile No. : 9486379448, Email ID : hemaselvan@gmail.com
Proposed Title	Existential Angst of the Marginalized A Postcolonial Reading of the Novels of Aneer Salim
Date of Commencement	30.12.2020

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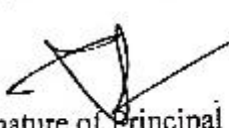
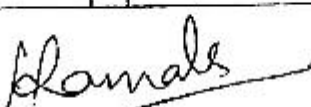
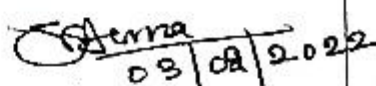
  
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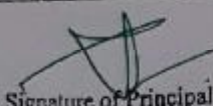
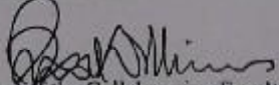
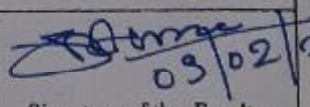


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1	Name of the Faculty with Designation, Staff ID	:	Dr. K. Hema Assistant Prof. of English Staff ID: ATEN04
2	Name of the Collaborating Faculty with Designation	:	Dr. T. Ratha Jeyalakshmi Dean, Research & Development
3	Name of the Collaborating Organization	:	Sri Sarada College for Women Tirunelveli
4	Nature of Collaboration (Academic / Research / Faculty Exchange / Student Exchange / Project / Internship / On-the Job Training)	:	Academic
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6	Period of Collaboration	:	From: June 2016 To: till date
7	Financial Involvement (if any)	:	—
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 Signature of Principal		 Signature of the Collaborating Faculty PRINCIPAL SRI SARADA COLLEGE FOR WOMEN (Autonomous) TIRUNELVELI - 627 011	
		 Signature of the Faculty 09/08/2022	



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1	Name of the Faculty with Designation, Staff ID	: <u>Dr. K. Hema</u> <u>Assistant Professor of English</u>
2	Name of the Collaborating Faculty with Designation	: <u>Dr. Lizie Williams.</u> <u>Assistant Professor of English.</u>
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5	Nature / Details of Outcome (Guest Lecture / DC member / Co-guide / Project Reports / Other Reports/Publications)	: <u>DC Member.</u>
6	Period of Collaboration	: From : <u>2021</u> To: <u>2024</u>
7	Financial Involvement (if any)	: <u>—</u>
8	Proof Attached	: Yes / No
 Signature of Principal		 Signature of the Collaborating Faculty <b>Dr. LIZIE WILLIAMS</b> Assistant Professor of English St. Xavier's College (Autonomous) Palayamkottai - 627 002.
		 Signature of the Faculty <u>03/02/2022</u>





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DR. C. KANNAN  
DIRECTOR

REF: MSU/RES/Admn/July 2020 Session

Date: December 30, 2020

## Ph.D. Programme Commencement Order

To  
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Nationality	Indian
PWD Status	Not Applicable
Admission Based On & Mode	M.Phil & PART TIME
Research Centre	St. Xavier's College (Autonomous), Tirunelveli
Name of the Supervisor with Address	Dr. Lizie William, Assistant Professor Department of English, St. Xavier's College (Autonomous), Palayamkottai, 627002 Mobile No. : 7708052024, Email ID : liziewilliams@gmail.com
Name of the Co-Supervisor with Address	NIL
Doctoral Committee Members	1. DR D JOCKIM, Assistant Professor, Department of English, St Xaviers College, Palayamkottai-627002 Mobile No. : 9994657296, Email ID : d.jockim@gmail.com  2. DR K HEMA, Assistant Professor, Department of English, Sadakathullah Appa College, Palayamkottai-627002 Mobile No. : 9486379448, Email ID : hemaselvan@gmail.com
Proposed Title	FICTION NEGOTIATING HISTORY - A COMPARATIVE STUDY OF SELECT NOVELS OF HILARY MANTEL AND C J SANSOM
Date of Commencement	30.12.2020

ASSISTANT

SUPERINTENDENT

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Copy To : Supervisor, Co-Supervisor (if applicable) / Research Centre / Doctoral Committee Members



3.7.1/Collaborative Activities/2020-21/13

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1	Name of the Faculty with Designation, Staff ID	:	Dr. S. Fithous Fatima Assistant Professor of Mathematics ATMA02
2	Name of the Collaborating Faculty with Designation	:	A. Ruby Priscilla Assistant Professor of Mathematics
3	Name of the Collaborating Organization	:	Sarah Tucker College (Autonomous) Tirunelveli - 627007
4	Nature of Collaboration (Academic / Research / Faculty Exchange / Student Exchange / Project / Internship / On-the Job Training)	:	Research
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7	Financial Involvement (if any)	:	-
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		A Ruby Priscilla	S. Fithous Fatima



# Implementation of Dual Encryption and Decryption Process by Correlating the Strong Vertex Magic Total Labelling of Complete Graph $K_5$ with the Polybius Square through Nihilist Cipher Algorithm

S. Firthous Fatima<sup>1</sup> and A .Ruby Priscilla<sup>2</sup>

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**Abstract**—In this paper, we probe a dual process of coding a message by abiding the technique of strong vertex magic total labelling of complete graph  $K_5$  with the Nihilist cipher algorithm. Here we appertain with the symmetric key cryptosystem for both encryption and decryption of messages as both the sender as well as the receiver shares the same key for encryption and decryption of messages. We design our initial cipher text through the strong vertex magic total labelling thereby mapping the labels to the text in the Polybius square and the second cipher text can be retrieved by appending the coordinates of the initial cipher text and the coordinates of the key obtained through Nihilist cipher algorithm. The initial decryption is processed by ensuing Nihilist cipher decryption algorithm and the subsequent decryption process lead us to capitulate our plain text by using clues given to change the label into signed label of the complete graph. This methodology is considered to be highly proficient by that ensuring secure interchange of information.

**Keywords**—Strong Vertex Magic Total Labelling, Cipher Text, Encryption, Decryption, Complete Graph.

AMS Subject Classification MSC (2010) No. 05C78

## I. INTRODUCTION

WE Implead an Encryption process I of our plaintext through strong vertex magic total labelling of the complete graph  $K_5$  which is considered to be the minimal graph applicable to our cryptographic technique by correlating with the traditional Polybius square to obtain the Cipher text-I. Moreover we proceed further to Encryption process II by processing the Cipher text-I through Nihilist Cipher Algorithm to retrieve Cipher text-II. The foremost objective behind our work is that the Cipher text-I is being lessen to the character compared to the original plaintext thereby securing the secret in an efficient way. We recall some graph nomenclature.

A graph  $G = (V, E)$  is a finite non-empty set  $V$  of objects called vertices together with a set  $E$  of unordered pairs of distinct vertices called edges. The cardinality of the vertex set of graph  $G$  is called the order of  $G$  and is denoted by  $|V|$ . The cardinality of its edge set is called the size of  $G$  and is denoted

by  $|E|$ . A graph in which any two distinct vertices are adjacent is called a complete graph and denoted by  $K_n$ . A vertex magic total labelling of a graph  $G = (V, E)$  is a bijection  $f: V \cup E \rightarrow \{1, 2, 3, \dots, |V| + |E|\}$  such that for every vertex  $w \in V$ ,  $f(w) + \sum_{uw \in E} f(uw) = k$  (Where  $k$  is a constant) [7]. A VMTL table of order  $n$  is an arrangement of integers in an  $n \times n$  matrix such that the sums of all the elements in every columns are equal. A normal magic square contains the integers from 1 to  $n^2/2$ . It exists for all orders  $n \geq 1$  except  $n = 2$ , although the case  $n = 1$  is trivial as it consists of a single cell containing the number. The constant sum in every row, column and diagonal is called the magic constant or magic sum,  $M$ . [8]. Next we proceed to recollect some basic encryption terms. In cryptography readable material is known as plaintext. Encryption is the process of converting data into an unrecognizable or encrypted form [2]. Encrypting the message into an unreadable format is called Cipher text [2]. The conversion of encrypted data into its original form is called Decryption. The essential tool that encodes the Plaintext and also decodes the Cipher text is called Key. (The proposed key length is need not to be same as the length of the plaintext. If the length of the key is shorter than the length of the plain text, then the key will be repeated periodically). Clue is a piece of information that leads out of a perplexity to retrieve the secret message shared by the sender. The origin and the utility of Nihilist cipher algorithm was described in [3]. An algorithm of the Nihilist cipher uses a matrix called a Polybius square was delineated in [5]. In this paper, we aim to incorporate the strong vertex magic labelling technique of the complete graph with the Polybius square through Nihilist cipher Algorithm.


## II. MAIN RESULTS

### A Procedure for Encryption Process I

- (i). Generate the Polybius square for the given key



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5	Nature / Details of Outcome (Guest Lecture / DC member / Co-guide / Project Reports / Other Reports/Publications)	:	Publications (Proceedings)
6	Period of Collaboration	:	From : 2020 To: 2021
7	Financial Involvement (if any)	:	-
8	Proof Attached	:	Yes / No
Signature of Principal		Signature of the Collaborating Faculty	
		A. Ruby Pisciella	
		Signature of the Faculty	
		S. Firthous Fatima	



## EXTENDED RELAXED SKOLEM MEAN LABELING OF GEAR GRAPH

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**Abstract:** In this paper, we evince the existence of an extended relaxed skolem mean labeling of gear graph  $G_n$  for  $n \geq 3$ . We also probe the necessary condition for the extended relaxed skolem mean gear graph .

**Keywords:** extended relaxed skolem mean labeling, gear graph

**AMS Subject classification MSC (2010) No:** 05C78 .

### 1 Introduction

Graphs regarded here are finite , undirected and simple. The symbols  $V(G)$  and  $E(G)$  denote the vertex set and the edge set of a graph  $G$ . Most graph labeling methods are derived from the descendants of by Rosa's[5] findings of the year 1967. A graph labeling is an assignment of integer to the vertices or edges or both subject to certain conditions. Labeled graph has many branch out applications such as coding theory , missile guidance , X-ray , crystallography analysis , communication network addressing systems , astronomy , radar ,circuit design , database management etc . D. S. T. Ramesh et.al.[4] introduced relaxed skolem mean labeling for four star . K. Murugan [3] introduced relaxed skolem mean labeling of bistars . Firthous Fatima . S et.al.[2] introduced an extended relaxed skolem mean labeling of crown and tadpole graphs . In this paper, we probe an extended relaxed skolem mean labeling of gear graph  $G_n$  for  $n \geq 3$  and its necessary condition .

### 2 Preliminaries

**Definition: 2.1** [4] A graph  $G = (V, E)$  with  $p$  vertices and  $q$  edges is said to be a skolem mean graph if there exists a function  $f$  from the vertex set of  $G$  to  $\{1, 2, \dots, p\}$  such that the induced map  $f^*$  from the edge set of  $G$  to  $\{2, 3, \dots, p\}$  defined by  $f^*(e=uv) =$

$$\begin{cases} \frac{f(u)+f(v)}{2} & \text{if } f(u) + f(v) \text{ is even} \\ \frac{f(u)+f(v)+1}{2} & \text{if } f(u) + f(v) \text{ is odd} \end{cases} \quad \text{then the resulting edges get distinct labels from the set } \{2, 3, \dots, p\}$$

**Definition: 2.2** [3] A graph  $G = (V, E)$  with  $p$  vertices and  $q$  edges is said to be a relaxed skolem mean graph if there exists a function  $f$  from the vertex set of  $G$  to  $\{1, 2, 3, \dots, p+1\}$  such that the induced map  $f^*$  from the edge set of  $G$  to  $\{2, 3, 4, \dots, p+1\}$  defined by

$$f^*(e=uv) = \begin{cases} \frac{f(u)+f(v)}{2} & \text{if } f(u) + f(v) \text{ is even} \\ \frac{f(u)+f(v)+1}{2} & \text{if } f(u) + f(v) \text{ is odd} \end{cases} \quad \text{then the resulting edges get distinct labels}$$

from the set  $\{2, 3, \dots, p+1\}$

**Definition: 2.3** [2] A graph  $G = (V, E)$  with  $p$  vertices and  $q$  edges is said to be an extended relaxed skolem mean graph if there exists an injection  $f$  from the vertex set of  $G$  to  $\{1, 2, \dots, p+V_L\}$

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		A. Ruby Priscilla	





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- Nagoorgani, A. & Chandrasekaran, V.T., *A First Look at Fuzzy Graph Theory*, Allied, 2010.
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### Extension Of Relaxed Skolem Mean Labelling Of Some Special Graphs

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#### Abstract

In this paper, we evince the existence of an extended relaxed skolem mean labeling of the crown  $C_n \odot K_1$  graph and the tadpole  $T_{n,k}$  graph.

Keywords: extended relaxed skolem mean labeling, crown graph, tadpole graph

AMS Subject classification MSC (2010) No: 05C78


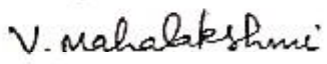
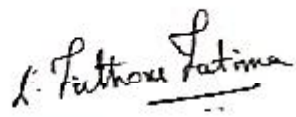
#### 1 Introduction

Graphs regarded here are finite, undirected and simple. The symbols  $V(G)$  and  $E(G)$  denote the vertex set and the edge set of a graph  $G$ . Most graph labeling methods are derived from the descendants of by Rosa's [12] findings of the year 1967. A graph labeling is an assignment of integer to the vertices or edges or both subject to certain conditions. Labeled graph has many branch out applications such as coding theory, missile guidance, X-ray, crystallography analysis, communication network addressing systems, astronomy, radar, circuit design





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5	Nature / Details of Outcome (Guest Lecture / DC member / Co-guide / Project Reports / Other Reports/Publications)	:	<b>DC Member - J. Siva Ranjini -</b> 19222012092003
6	Period of Collaboration	:	From: Jan 2019 To: Till Date
7	Financial Involvement (if any)	:	-
8	Proof Attached	:	Yes / No
 Signature of Principal		 Signature of the Collaborating Faculty  <b>Dr. (Mrs). V. MAHALAKSHMI</b> Assistant Professor of Mathematics A.P.C. Mahalakshmi College For Women Thoothukudi - 628 002.	
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**DR. K. SENTHAMARAI KANNAN**  
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REF : MSU/RES/Admn/July 2019

Date : July 23, 2019

**Ph.D., Programme Commencement Order**

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Sub: Registration for doing Ph.D., programme - Date of Commencement of Research work - Intimation - Reg

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Registration No.	19222012092003
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Date of Commencement	23.07.2019

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Copy To : Supervisor, Co-Supervisor (if applicable) / Research Centre / Doctoral Committee Members





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2	Name of the Collaborating Faculty with Designation	:	<b>Dr.K. Alli</b> Assistant Professor Department of Mathematics The M.D.T Hindu College
3	Name of the Collaborating Organization	:	<b>The M.D.T Hindu College, Tirunelveli</b>
4	Nature of Collaboration (Academic / Research / Faculty Exchange / Student Exchange / Project / Internship / On-the Job Training)	:	<b>Research</b>
5	Nature / Details of Outcome (Guest Lecture / DC member / Co-guide / Project Reports / Other Reports/Publications)	:	<b>DC Member – ROSEMATITY Y- 18111072092002</b>
6	Period of Collaboration	:	From : 10.01.2018      To: Till Date
7	Financial Involvement (if any)	:	No
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
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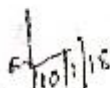
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| 8. Admission Based On                  | : M.Phil  |
| 9. Name of the Supervisor              | : Dr. K. Alli   |
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| 13. Date of Commencement               | : 10.01.2018  |
| 14. Proposed Title                     | : A STUDY ON NEW TYPE OF CLOSED SETS IN TOPOLOGICAL SPACES  |
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5	Nature / Details of Outcome (Guest Lecture / DC member / Co-guide / Project Reports / Other Reports/Publications)	: 1. Co Guide – M. Sulaiga Beevi - 17214012271151 2. Publications
6	Period of Collaboration	: From : 10.08.2017 To: 27.07.2021
7	Financial Involvement (if any)	: No
8	Proof Attached	: Yes

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| 5. Social Category (Community)         | : BCM  |
| 6. Nationality                         | : INDIAN   |
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| 13. Date of Commencement               | : 10.08.2017   |
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10/08/17  
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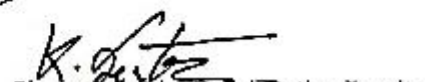


## Sadakathullah Appa College (Autonomous)

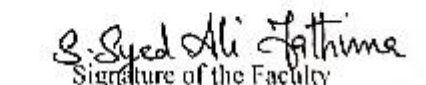
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4	Nature of Collaboration (Academic / Research / Faculty Exchange / Student Exchange / Project / Internship / On-the Job Training)	: Research
5	Nature / Details of Outcome (Guest Lecture / DC member / Co-guide / Project Reports / Other Reports/Publications)	: 1. Co Guide – M. Sulaiga Beevi - 17214012271151 2. Publications
6	Period of Collaboration	: From : 10.08.2017 To: 27.07.2021
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Publications  
70 in number

# Multivariate Markov Chain Model for Fuzzy Time Series

M. Sulaiga Beevi<sup>(1)</sup>, Prof. Dr.K. Senthamarai Kannan<sup>(2)</sup>, Dr.S. Syed Ali Fathima<sup>(3)</sup>

<sup>1,2</sup> Department of Statistics, Manonmaniam Sundaraman University, Tirunelveli - 627012.

<sup>3</sup> Department of Mathematics, Sadokathullah Appa College, Tirunelveli - 627011.

**Abstract** — The dollar is important indicator of the Indian Economy. Crude oil and gold dominated because of increasing the dollar price. Markov chain is one of the essential tools for finding the categorical data. In many situations categorical data sequences in the same time period so data sequences can be correlated. Monthly changes of crude oil price and gold prices are two categorical data sequences is analyzed multivariate Markov chain model. Simple linear regression analysis is using these categorical data sequence. The entire transition probability matrix and Transition digraph are calculated using R (3.2.1) language.

**Key words** — Fuzzy Time Series, Markov chain, Multivariate, Transition probability matrix, Transition digraph.

## 1. INTRODUCTION

Dollar is a one of the important place in the world market. Ruppes value decreasing is the main factor of increases dollar index. The record setting of US dollars directly affected the Indian market because most of the business does their business in US dollars and also crude oil and gold rate is measured in terms of US dollars. Every \$10 per barrel rise in the price will worsen India's fiscal balance by 0.1%. Time series data happen regularly in numerous real world applications. One of the major significant strides in breaking down period arrangement information is the determination of suitable scientific model for the data, because it helps in expectation, speculation testing and rule disclosure. The Multivariate Markov chain Model indicates the behaviour of multiple time series fuzzy logic data generated by similar source.

L.Zadeh (1965) presented fuzzy sets with a membership function that ranges from zero to one. Further in 1993 Song and chissom introduced Fuzzy Time series (FTS) model for finding the enrollment data of University of Alabama. In 1994 Song and chissom used time -variant model for the same problem. A basic definition of dependence value of  $M_n$  is a successive transition was introduced by Russian mathematician Andrey Markov (1906) and is known as Markov dependence. In 1985 Adrin Raftery et.al introduced higher order Markov chain model and also in 1994 he proposed computational algorithm for higher order Markov chain model. Bruno Damásio and Sandro Mendonça (2018): explained about the dynamics between the two capital goods using a vector autoregression approach (VAR) and a Multivariate Markov Chain approach (MMC) and also analysed the intriguing relationship between sail and steam at the dawn of globalising industrial capitalism. They also provided the evidence that improvements in the incumbent and insurgent technologies appear interrelated. Rafaela Boeira Cechin and et al. (2019) High-order multivariate Markov chains were used to analyze the state transition probabilities between the Ibovespa index and the Dow Jones index.





## Sadakathullah Appa College (Autonomous)

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3	Name of the Collaborating Organization	The M.D.T Hindu College, Tirunelveli
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5	Nature / Details of Outcome (Guest Lecture / DC member / Co-guide / Project Reports / Other Reports/Publications)	Publications – 2020
6	Period of Collaboration	From: 10.08.2017 To: Till Date
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# Some salient feature of topological simple ring

U. Jerseena<sup>1\*</sup>, S. Syed Ali Fathima<sup>2</sup> and K. Alli<sup>3</sup>

## Abstract

In this paper, we manifest the distinct feature of topological simple ring. A topological simple ring has the algebraic structure of ring and topological structure of a topological space. Further we provide a view of some basic results and theorem related to topological simple.

## Keywords

Topological space, Continuous function, Topological ring, topological simple ring, ideals.

## AMS Subject Classification

54Hxx, 54C05.

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6	Acknowledgment .....	1915
	References .....	1915

## 1. Introduction

This paper attributes the concept of topological simple ring. Also here we elucidate some examples and basic results related to topological simple ring.

The concept of topological ring was introduced by D. Van Dantzig and N. Jacobson introduced the totally disconnected locally compact ring and Kalpanasy introduced the compact ring. Later the concept of topological ring was developed and studied by S. Warner[6]. Koteswara Rao introduced the topological 3-ring.

## 2. Preliminaries

In this section, we recall some definitions and basic results of Topology and algebra which will be used throughout the paper.

**Definition 2.1.** [3] A topology on a set  $X$  is a collection  $T$  of subsets of  $X$  having the following properties

(i)  $\emptyset$  and  $X$  are in  $T$

(ii) The union of the elements of any subcollection of  $T$  is in  $T$

(iii) The intersection of the elements of any finite subcollection of  $T$  is in  $T$ .

A set  $X$  for which a topology  $T$  has been specified is called a topological space.

**Definition 2.2.** [3] A subset  $U$  of  $X$  is an open set of  $X$  if  $U$  belongs to the collection  $T$ . The complement of open set is called closed set.

**Definition 2.3.** [3] Let  $X$  and  $Y$  be topological space. A function  $f : X \rightarrow Y$  is said to be continuous if for each open subset  $V$  of  $Y$ , the set  $f^{-1}(V)$  is an open subset of  $X$ .

**Definition 2.4.** [3] Let  $X$  and  $Y$  be the topological space; let  $f : X \rightarrow Y$  be a bijection. If both the function  $f$  and the inverse function  $f^{-1} : Y \rightarrow X$  are continuous, then  $f$  is called a homeomorphism.

**Definition 2.5.** [6] A topology  $T$  on a ring  $A$  is a ring topology and  $A$  furnished with  $T$  is a topological ring if the following conditions hold

(i)  $(x, y) \rightarrow x + y$  is continuous from  $A \times A \rightarrow A$

(ii)  $x \rightarrow -x$  is continuous from  $A \rightarrow A$

(iii)  $(x, y) \rightarrow xy$  is continuous from  $A \times A \rightarrow A$ .





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3	Name of the Collaborating Organization	: The M.D.T Hindu College, Tirunelveli
4	Nature of Collaboration (Academic / Research / Faculty Exchange / Student Exchange / Project / Internship / On-the Job Training)	: Research
5	Nature / Details of Outcome (Guest Lecture / DC member / Co-guide / Project Reports / Other Reports/Publications)	: Publications - 2020
6	Period of Collaboration	: From: 10.08.2017 To: Till Date
7	Financial Involvement (if any)	: No
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With seal

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With seal

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S. Syed Ali Fathima  
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## Scheduling a Triple Split Round-Robin Tournament using Independent Edge Domination

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<sup>1</sup>Research Scholar, Sadakathullah Appa College affiliated to Manonmaniam Sundaranar University, Abishekapatti, Tirunelveli – 627012, Tamil Nadu (India)

<sup>2</sup>Department of Mathematics, Sadakathullah Appa College affiliated to Manonmaniam Sundaranar University, Abishekapatti, Tirunelveli – 627012, Tamil Nadu (India)

<sup>3</sup>Department of Mathematics, The M.D.T. Hindu College affiliated to Manonmaniam Sundaranar University, Abishekapatti, Tirunelveli – 627012, Tamil Nadu (India)

<sup>a)</sup>sulthanahthar@gmail.com

<sup>b)</sup>syedalifathima2014@gmail.com

<sup>c)</sup>allimdt@gmail.com

**Abstract:** In this paper work, we wish to Schedule Triple Split Round -Robin Tournament with the help of graph using independent edge domination.

**Keywords:** Round-Robin, Domination, edge domination.

### INTRODUCTION

Domination in graphs is the most interesting area for many researchers in graph theory all over the world. The concept of domination can be applied to form various Mathematical models for practical problems. Sports tournament are main economic activities around the world. They draw attention of millions of people around the globe. The broadcasters and organizer invest a lot of money in sports events. The schedule is the main aspect of the tournament.

A **round-robin** is a sports competition in which each player or team plays against every other player or team. When a round robin format is desirable but the number of entries is too large, splitting the entries into divisions which have same number of players or teams. A **triple split round-robin** is a round robin whose teams or players divided into three divisions which have same number of players or teams such that each player or team in a division should play with all other player or team in other two divisions. In this paper work, we wish to Schedule a Triple Split Round -Robin Tournament with the help of graph using independent edge domination.

### Definition

A **graph** is an ordered pair  $G = (V, E)$  where  $V$  is the vertex set and  $E$  is the edge set. A **complete graph** is a graph in which each pair of graph vertices is connected by an edge. A complete graph with  $n$  vertices denoted by ' $K_n$ ' is a graph with  $n$  vertices in which each vertex is connected to each of the others. A set  $D$  of vertices in a graph  $G = (V, E)$  is called a **dominating set** of  $G$  if every vertex in  $V - D$  is adjacent to some vertex in  $D$ . The cardinality of minimum dominating set is called **domination number** it is denoted by  $\gamma(G)$ . A set  $F$  of edges in a graph  $G = (V, E)$  is called an **edge dominating set** of  $G$  if every edge in  $E - F$  is adjacent to at least one edge in  $F$  and is an **independent edge dominating set** if edges are independent.

### SCHEDULING A TRIPLE SPLIT ROUND-ROBIN TOURNAMENT

#### Triple split round robin tournament teams scheduling using independent edge domination

The triple split round robin tournament can be schedule using independent edge dominating method. For 6 teams (2 teams in each division) and 9 teams (3 teams in each division), it is easy to schedule triple split round robin tournament using trial and error method. For 12 teams (4 teams in each division) it can be schedule but it takes more time. However, scheduling for 15 teams (5 teams in each division), using an exhaustive search could take many





## Sadakathullah Appa College (Autonomous)

Rahmath Nagar, Tirunelveli - 627011

1	Name of the Faculty with Designation, Staff ID	: Dr. S. Syed Ali Fathima Assistant Professor Department of Mathematics Sadakathullah Appa College, Tirunelveli-11  Staff ID: ATMA04
2	Name of the Collaborating Faculty with Designation	: Dr.K. Alli Assistant Professor Department of Mathematics The M.D.T Hindu College
3	Name of the Collaborating Organization	: The M.D.T Hindu College, Tirunelveli
4	Nature of Collaboration (Academic / Research / Faculty Exchange / Student Exchange / Project / Internship / On-the Job Training)	: Research
5	Nature / Details of Outcome (Guest Lecture / DC member / Co-guide / Project Reports / Other Reports/Publications)	: DC Member – M. ARLINE JEYAMARY - 12564
6	Period of Collaboration	: From : 28.06.2017 To: Till Date
7	Financial Involvement (if any)	: No
8	Proof Attached	: Yes

Signature of Principal  
With seal

Signature of the Collaborating Faculty  
With seal

**Dr. K. ALLI, M.Sc., M.Phil., Ph.D.,**  
Assistant Professor,  
Department of Mathematics,  
The M.D.T Hindu College,  
TIRUNELVELI - 627 010

Signature of the Faculty

**S. Syed Ali Fathima**  
Assistant Professor of Mathematics,  
Sadakathullah Appa College (Autonomous),  
Rahmath Nagar, Tirunelveli - 627 011.



MANONMANIAM SUNDARANAR UNIVERSITY  
TIRUNELVELI - 627 012, TAMIL NADU, INDIA  
(REACCREDITED WITH B GRADE BY NAAC)

DR. K. SENTHAMARAI KANNAN  
DIRECTOR (CENTRE FOR RESEARCH)

ADISHEKAPATTI,  
TIRUNELVELI 627 012

28.05.2017

No. MSUI/Res/R1/Doctoral Committee/Jan, 2017

1. **Dr. K. Ali**  
Asst. Professor of Mathematics,  
The M D T Hindu College,  
Tirunelveli. (Guide)- Convener
2. **Dr. S. Syed Ali Fathima**  
Asst. Professor of Mathematics,  
Sadakathullah Appa College,  
Tirunelveli. - Doctoral Committee Member
3. **Dr. R. Gowri**  
Asst. Professor of Mathematics,  
Govt. College for Women,  
Kumbakonam. - Doctoral Committee Member

Sir/Madam,

I am by direction, to inform, that you are nominated as convener (default) / Doctoral Committee member / Co-Guide (member) in respect of the scholar Ms. M. Arline Jeyamary, Reg.No.12564.

You are requested to meet four times during the Ph.D programme of the scholar to decide the following:

1. To approve the research proposal and prescribe the course work within six months from the date of registration.
2. To assess and monitor the quantum of work done and confirm the provisional registration by the candidate after one year from the date of registration;
3. To approve the Pre-Ph.D presentation, approval and synopsis and panel of examiners for adjudication of the thesis;
4. To consolidate and approve the adjudication reports for conduct of Ph.D viva-voce examination.

(i) The Head of the Department of the University / Head of the Department of the Research Centre (duly forwarded by the Principal of the Research Centre) shall forward the Doctoral committee minutes (in the format enclosed) to the 2 (Research), However, the meetings of Doctoral Committee should be informed to the Director (Research) with a copy to Head of the Department / Director of the Centre well in advance.

Yours faithfully

  
DIRECTOR  
11/11/17 P. 12/01/17  
3/15

Encl: Proforma  
Copy to:  
Ms. M. Arline Jeyamary  
2/20, Perinbapuram,  
Sengulam (P.O),  
Tirunelveli - 627 152.  
(M) 9751819631.

- Candidate

Phone: EPABX: 0462- 2333741, Mobile: 9487999692, 9487907000, Fax: 0462-2322973, www. msuniv.ac.in





## Sadakathullah Appa College (Autonomous)

Rahmath Nagar, Tirunelveli - 627011

1	Name of the Faculty with Designation, Staff ID	: Dr. S. Syed Ali Fathima Assistant Professor Department of Mathematics Sadakathullah Appa College, Tirunelveli-11 Staff ID: ATMA04
2	Name of the Collaborating Faculty with Designation	: Dr. R. Selvi Assistant Professor Department of Mathematics Sri Parasakthi College for Women
3	Name of the Collaborating Organization	: Sri Parasakthi College for Women, Courtallam
4	Nature of Collaboration (Academic / Research / Faculty Exchange / Student Exchange / Project / Internship / On-the Job Training)	: Research
5	Nature / Details of Outcome (Guest Lecture / DC member / Co-guide / Project Reports / Other Reports/Publications)	: DC Member - RAJALAKSHMI - 19211202092002
6	Period of Collaboration	: From : 23.07.2019 To: Till Date
7	Financial Involvement (if any)	: No
8	Proof Attached	: Yes

Signature of Principal  
With seal

Signature of the Collaborating Faculty  
With seal

**Dr. R. SELVI**  
Assistant Professor of Maths  
Sri Parasakthi College for Women  
Courtallam-627 802

Signature of the Faculty  
With seal

**S. Syed Ali Fathima**  
Assistant Professor of Mathematics,  
Sadakathullah Appa College (Autonomous),  
Rahmath Nagar, Tirunelveli - 627 011.



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# MANONMANIAM SUNDARANAR UNIVERSITY

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CENTRE FOR RESEARCH

ABISHEKAPATTI, TIRUNELVELI - 627 012, TAMILNADU, INDIA

Phone : 0462 - 2333741, 9407907000, Intercom: 2563073, Mail: cfmsu@msuniv.ac.in, web: msuniv.ac.in



DR. K. SENTHAMARAI KANNAN  
DIRECTOR

REF : MSU/RES/Admn/July 2019

Date : July 23, 2019

## Ph.D. Programme Commencement Order

To

RAJALAKSHMI J  
14A, SOMIYAPURAM STREET, RAJAPALAYAM  
Virudhunagar, Tamil Nadu, Pincode - 626117  
Mobile No. : 9825914305, Email ID : rajalakshmi06@gmail.com

Sir/Madam,

Sub: Registration for doing Ph.D., programme - Date of Commencement of Research work -  
Information - Reg

Ref: Counseling attended by the candidate for July 2019 session.

\*\*\*\*\*

With reference to the above, you are provisionally registered for Ph.D., Programme as detailed below :

Name of the Scholar	RAJALAKSHMI J
Registration No.	19211202092002
Discipline	Mathematics
Gender / Community	Female / SC
Nationality	INDIAN
PWD Status	Not Applicable
Admission Based On / Mode	PG / FULL TIME
Research Centre	Sri Parasakthi College for Women, Courtallam
Name of the Supervisor with Address	Dr. R. Selvi, Assistant Professor Department of Mathematics, Sri Parasakthi College for Women (Autonomous), Courtallam, 627802 Mobile No. : 9443285852, Email ID : r.selvi@vithu@gmail.com
Name of the Co-Supervisor with Address	NIL
Doctoral Committee Members	1. DR KALA, Professor, Department of Mathematics, Manonmaniam Sundaranar University, Tirunelveli - 627012 Mobile No. : 9466902837; Email ID: Karthiyal@yahoo.co.in  2. DR S SYED ALI FATHIMA, Assistant Professor, Department of Mathematics, Sadakathullahi Appa College, Tirunelveli Mobile No. : 9865337934; Email ID : syedalifathima2014@gmail.com
Proposed Title	A STUDY ON ROUGH SET THEORY IN IDEAL TOPOLOGICAL SPACES
Date of Commencement	23.07.2019

ASSISTANT SUPERINTENDENT ASSISTANT REGISTRAR




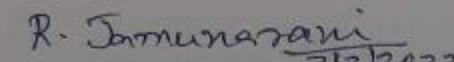


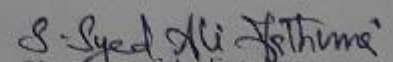
## Sadakathullah Appa College (Autonomous)

Rahmath Nagar, Tirunelveli - 627011

1	Name of the Faculty with Designation, Staff ID	: Dr. S. Syed Ali Fathima Assistant Professor Department of Mathematics Sadakathullah Appa College, Tirunelveli-11  Staff ID: ATMA04
2	Name of the Collaborating Faculty with Designation	: Dr. R. Jamuna Rani Assistant Professor Department of Mathematics Rani Anna Govt. College for Women
3	Name of the Collaborating Organization	: Rani Anna Govt. College for Women, Tirunelveli
4	Nature of Collaboration (Academic / Research / Faculty Exchange / Student Exchange / Project / Internship / On-the Job Training)	: Research
5	Nature / Details of Outcome (Guest Lecture / DC member / Co-guide / Project Reports / Other Reports/Publications)	: DC Member - VELRAJ . C - 20221172091005
6	Period of Collaboration	: From : 30.12.2020      To: Till Date
7	Financial Involvement (if any)	: No
8	Proof Attached	: Yes

  
Signature of Principal  
With seal

  
Signature of the Collaborating Faculty  
With seal

  
Signature of the Faculty  
With seal

**DR. R. JAMUNA RANI** MSc. M.Phil. Ph.D  
ASSISTANT PROFESSOR  
DEPARTMENT OF MATHEMATICS  
RANI ANNA GOVT. COLLEGE FOR WOMEN  
TIRUNELVELI - 627011

**S. Syed Ali Fathima**  
Assistant Professor of Mathematics,  
Sadakathullah Appa College (Autonomous),  
Rahmath Nagar, Tirunelveli - 627 011.



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**CENTRE FOR RESEARCH**

ABISHEKAPATTI, TIRUNELVELI - 627 012, TAMILNADU, INDIA

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**DR. C. KANNAN**  
**DIRECTOR**

REF : MSU/RES/Admn/July 2020 Session

Date : December 30, 2020

**Ph.D., Programme Commencement Order**

To

VELRAJ C  
936 MIDDLE STREET, PIRAIKUDIYERUPPU, MEYYUR POST  
Thoothukudi, Tamil Nadu, Pincode - 628203  
Mobile No. : 9442569330, Email ID : velraj.c78@gmail.com



Sir/Madam,

Sub: Registration for doing Ph.D., programme - Date of Commencement of Research work -  
Intimation - reg.

Ref: Counselling attended by the candidate for July 2020 session.

\*\*\*\*\*

With reference to the above, you are provisionally registered for Ph.D., Programme as detailed below :

Name of the Scholar	VELRAJ C
Registration No.	20221172091005
Discipline	Mathematics
Gender & Community	Male & BC
Nationality	Indian
PWD Status	Not Applicable
Admission Based On & Mode	M.Phil & PART TIME
Research Centre	Rani Anna Government College for Women, Tirunelveli
Name of the Supervisor with Address	<b>Dr. R. Jamuna Rani, Assistant Professor</b> Department of Mathematics, Rani Anna Government College for Women, Tirunelveli, 627008 Mobile No. : 9894844628, Email ID : jamunarani1977@gmail.com
Name of the Co-Supervisor with Address	NIL
Doctoral Committee Members	<p>1. DR M ANITHA, Assistant Professor, Department of Mathematics, Rani Anna Government College for Women, Tirunelveli - 627008 Mobile No. : 9943845052, Email ID : drmanitha10@gmail.com</p> <p>2. DR S SYED ALI FATHIMA, Assistant Professor, Department of Mathematics, Sadakathulla Appa College, Palayamkottai - 627003 Mobile No. : 9965339934, Email ID : syedalifathima2014@gmail.com</p>
Proposed Title	Study on Some Subsets in Intuitionistic Topological Space
Date of Commencement	30.12.2020

ASSISTANT SUPERINTENDENT

ASSISTANT REGISTRAR

DIRECTOR

DIRECTOR

Copy To : Supervisor, Co-Supervisor (if applicable) / Research Centre / Doctoral Committee Members








## Sadakathullah Appa College (Autonomous)

### Rahmath Nagar, Tirunelveli - 627011

1	Name of the Faculty with Designation, Staff ID	: Dr. S. Syed Ali Fathima Assistant Professor Department of Mathematics Sadakathullah Appa College, Tirunelveli-11  Staff ID: ATMA04
2	Name of the Collaborating Faculty with Designation	: Dr. M. Anitha Assistant Professor Department of Mathematics Rani Anna Govt. College for Women
3	Name of the Collaborating Organization	: Rani Anna Govt. College for Women, Tirunelveli
4	Nature of Collaboration (Academic / Research / Faculty Exchange / Student Exchange / Project / Internship / On-the Job Training)	: Research
5	Nature / Details of Outcome (Guest Lecture / DC member / Co-guide / Project Reports / Other Reports/Publications)	: DC Member - MANISHA M - 20111172092016
6	Period of Collaboration	: From : 10.03.2020 To: Till Date
7	Financial Involvement (if any)	: No
8	Proof Attached	: Yes

  
 Signature of Principal  
 With seal

  
 Signature of the Collaborating Faculty  
 Dr. Mrs. M. ANITHA, M.Sc., M.Phil., Ph.D., PGDCAR  
 ASSISTANT PROFESSOR,  
 DEPARTMENT OF MATHEMATICS  
 RANI ANNA GOVT. COLLEGE FOR WOMEN  
 TIRUNELVELI-627008.

  
 Signature of the Faculty  
 With seal  
 S. Syed Ali Fathima  
 Assistant Professor of Mathematics,  
 Sadakathullah Appa College (Autonomous),  
 Rahmath Nagar, Tirunelveli - 627 011.

3.7.1/Collaborative Activities/2020-21/26



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**DR. K. SENTHAMARAI KANNAN**  
**DIRECTOR**

REF : MSU/RES/Admn/January 2020

Date : March 10, 2020

**Ph.D., Programme Commencement Order**

To

MANISHA M  
WARD 9 DOOR NO 17, NEW COLONY, ALANGULAM  
Tirunelveli, Tamil Nadu, Pincode - 627851  
Mobile No. : 7708635950, Email ID : mathiyasmanisha@gmail.com



Sir/Madam,

Sub: Registration for doing Ph.D., programme - Date of Commencement of Research work -  
Intimation - Reg

Ref: Counseling attended by the candidate for January 2020 session.

\*\*\*\*\*

With reference to the above, you are provisionally registered for Ph.D., Programme as detailed below :

Name of the Scholar	MANISHA M
Registration No.	20111172092016
Discipline	Mathematics
Gender / Community	Female / BC
Nationality	INDIAN
PWD Status	Not Applicable
Admission Based On / Mode	PG / FULL TIME
Research Centre	Rani Anna Govt. College for Women, Tirunelveli.
Name of the Supervisor with Address	Dr. M. Anitha, Assistant Professor Department of Mathematics, Rani Anna Government College for Women, Tirunelveli, 627008 Mobile No. : 9943845052, Email ID : drmanitha10@gmail.com
Name of the Co-Supervisor with Address	NIL
Doctoral Committee Members	1. DR D PREMALATHA, Associate Professor and Head, Department of Mathematics, Rani Anna Government College for Women, Tirunelveli- 627008 Mobile No. : 9487761385, Email ID : lathaacdward@gmail.com
	2. DR S SYED ALI FATHIMA, Assistant Professor, Department of Mathematics, Sadakathullah Appa College, Tirunelveli - 627011, 9965337934 Mobile No. : 9965337934, Email ID : syedalifathima2014@gmail.com
Proposed Title	A STUDY ON NANO PRE-GENERALIZED PRE-REGULAR CLOSED SETS IN NANO TOPOLOGICAL SPACES
Date of Commencement	10.03.2020

*Manisha*

ASSISTANT

*CP*

SUPERINTENDENT

*of*

ASSISTANT REGISTRAR

*K. Senthamarai Kannan*

DIRECTOR

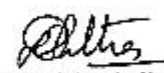


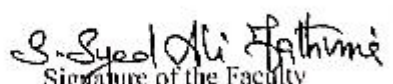


**Sadakathullah Appa College (Autonomous)**  
Rahmath Nagar, Tirunelveli - 627011

1	Name of the Faculty with Designation, Staff ID	: Dr. S. Syed Ali Fathima Assistant Professor Department of Mathematics Sadakathullah Appa College, Tirunelveli-II Staff ID: ATMA04
2	Name of the Collaborating Faculty with Designation	: Dr. D. Premalatha Head and Associate Professor Department of Mathematics Rani Anna Govt. College for Women
3	Name of the Collaborating Organization	: Rani Anna Govt. College for Women, Tirunelveli
4	Nature of Collaboration (Academic / Research / Faculty Exchange / Student Exchange / Project / Internship / On-the Job Training)	: Research
5	Nature / Details of Outcome (Guest Lecture / DC member / Co-guide / Project Reports / Other Reports/Publications)	: DC Member – GLADYS MANO AMIRTHA -V 20111172092013
6	Period of Collaboration	: From : 10.03.2020 To: Till Date
7	Financial Involvement (if any)	: No
8	Proof Attached	: Yes

  
Signature of Principal  
With seal

  
Signature of the Collaborating Faculty  
With seal  
**Dr. D. PREMALATHA, M.Sc., M.Phil., Ph.D.,**  
Associate Professor & Head  
PG & Research Dept. of Mathematics  
RANI ANNA GOVT. COLLEGE (W)  
TIRUNELVELI - 627 008

  
Signature of the Faculty  
With seal  
**S. Syed Ali Fathima**  
Assistant Professor of Mathematics,  
Sadakathullah Appa College (Autonomous),  
Rahmath Nagar, Tirunelveli - 627 011.



**MANONMANIAM SUNDARANAR UNIVERSITY**  
 Reaccredited with 'A' Grade by NAAC (3rd Cycle)  
**CENTRE FOR RESEARCH**

ABISHEKAPATTI, TIRUNELVELI - 627 012, TAMILNADU, INDIA  
 Phone : 0462 - 2333741, 9467907008, Intercom: 2563073, Mail: cfrmsu@msuniv.ac.in, web: msuniv.ac.in



**DR. K. SENTHAMARAI KANNAN**  
**DIRECTOR**

Date : March 10, 2020

REF : MSU/RES/Admn/January 2020

**Ph.D., Programme Commencement Order**

To

GLADYS MANO AMIRTHA V  
 7, 1st STREET, IOB COLONY, GANDHINAGAR  
 Thirunelveli, Tamil Nadu, Pincode - 627008  
 Mobile No. : 9486904226, Email ID : gladyspeter3@gmail.com



Sir/Madam,

Sub: Registration for doing Ph.D., programme - Date of Commencement of Research work -  
 Intimation - Reg

Ref: Counseling attended by the candidate for January 2020 session.

\*\*\*\*\*

With reference to the above, you are provisionally registered for Ph.D., Programme as detailed below :

Name of the Scholar	GLADYS MANO AMIRTHA V
Registration No.	20111172092013
Discipline	Mathematics
Gender / Community	Female / BC
Nationality	INDIAN
PWD Status	Not Applicable
Admission Based On / Mode	PG / FULL TIME
Research Centre	Rani Anna Govt. College for Women, Tirunelveli.
Name of the Supervisor with Address	Dr. D. Premalatha, Associate Professor Department of Mathematics, Rani Anna Government College for Women, Tirunelveli, 627008 Mobile No. : 9487751385, Email ID : lathaedward@gmail.com
Name of the Co-Supervisor with Address	NIL
Doctoral Committee Members	1. DR S SANTHA, Assistant Professor, Department of Mathematics, Rani Anna College for Women, Tirunelveli-627008. Mobile No. : 9486519215, Email ID : santilawilliam14@gmail.com  2. DR S SYED ALI FATHIMA, Assistant Professor, Department of Mathematics, Sadakathullah Appa College, Tirunelveli-627003. Mobile No. : 9965337834, Email ID : syedAliFathima2014@gmail.com
Proposed Title	A Study on some topics of Algebraic Gray system theory
Date of Commencement	10.03.2020

*[Signature]*

ASSISTANT SUPERINTENDENT

*[Signature]*

ASSISTANT REGISTRAR

*[Signature]*

*[Signature]*

DIRECTOR

Copy To : Supervisor, Co-Supervisor (if applicable) / Research Centre / Doctoral Committee Members




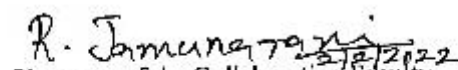



## Sadakathullah Appa College (Autonomous)

### Rahmath Nagar, Tirunelveli - 627011

1	Name of the Faculty with Designation, Staff ID	: Dr. S. Syed Ali Fathima Assistant Professor Department of Mathematics Sadakathullah Appa College, Tirunelveli-11  Staff ID: ATMA04
2	Name of the Collaborating Faculty with Designation	: Dr. R. Jamuna Rani Assistant Professor Department of Mathematics Rani Anna Govt. College for Women
3	Name of the Collaborating Organization	: Rani Anna Govt. College for Women, Tirunelveli
4	Nature of Collaboration (Academic / Research / Faculty Exchange / Student Exchange / Project / Internship / On-the Job Training)	: Research
5	Nature / Details of Outcome (Guest Lecture / DC member / Co-guide / Project Reports / Other Reports/Publications)	: DC Member - ANEES FATHIMA M - 19121172092012
6	Period of Collaboration	: From : 20.12.2018                      To: Till Date
7	Financial Involvement (if any)	: No
8	Proof Attached	: Yes

  
 Signature of Principal  
 With seal

  
 Signature of the Collaborating Faculty  
 With seal

  
 Signature of the Faculty  
 With seal

**D. R. JAMUNA RANI** MSc, M.Phil, Ph.D  
 ASSISTANT PROFESSOR  
 DEPARTMENT OF MATHEMATICS  
 RANI ANNA GOVT COLLEGE FOR WOMEN  
 TIRUNELVELI - 627008

**S. Syed Ali Fathima**  
 Assistant Professor of Mathematics,  
 Sadakathullah Appa College (Autonomous),  
 Rahmath Nagar, Tirunelveli - 627 011.


**MANONMANIAM SUNDARANAR UNIVERSITY**

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**CENTRE FOR RESEARCH**

ABISHEKAPATTI, TIRUNELVELI - 627 012, TAMILNADU, INDIA

Phone : 0462 - 2333741, 9447007000, Int. no. 2553073, Mail : cfrcmsu@manu.ac.in, web : manufrae.in


**DR. K. SENTHAMARAI KANNAN**  
**DIRECTOR**

Date : December 20, 2018

REF : MSU/RES/Admn/Jan 2019

**Ph.D. Programme Commencement Order**

DC-17-18

To

**ANEES FATHIMA M**  
 No 7, R P west street, Pettai, Tirunelveli 627004, 35, Thiruvannamudi Amman Kovil West Street, Pettai, Tirunelveli 627004  
 Tamil Nadu, Tirunelveli, Pincode - 627004  
 Mobile No. : 9487784186, Email ID : afliesyan09@gmail.com

Sir/Madam,

 Sub: Registration for doing Ph.D. programme - Date of Commencement of Research work - Intimation - Reg  
 Ref: Counseling attended by the candidate for January 2019 session.  
 \*\*\*\*\*

With reference to the above, you are provisionally registered for Ph.D. Programme as detailed below :

Name of the Scholar	ANEES FATHIMA M
Registration No.	19121172092012
Discipline	Mathematics
Gender / Community	Female / BCM
Nationality	Indian
PWD Status	Not Applicable
Admission Based On / Mode	M.Phil / PART TIME INTERNAL
Research Centre	Rani Anna Govt. College for Women, Tirunelveli.
Name of the Supervisor	Dr.R.Jamuna Rani, Department of Mathematics, Rani Anna Govt. College for Women, Tirunelveli Mobile No. : 9894844528, Email ID : jamunaran1977@gmail.com
Name of the Co-Supervisor	NIL
Doctoral Committee Members	1. DR M ANITHA, Assistant professor, Dept of mathematics, Rani Anna Womens college, Tirunelveli Mobile No. : 9943845052, Email ID : drmanitha10@gmail.com  2. DR S SYED ALI FATHIMA, Assistant professor, Dept of mathematics, Sadakathullah appa college, Tirunelveli Mobile No. : 9945337934, Email ID : syedalifathima2014@gmail.com
Proposed Title	A Study on the Properties of Bi-Generalized Topological Spaces
Date of Commencement	20.12.2018

  
 ASSISTANT


  
 SUPERINTENDENT


  
 ASSISTANT REGISTRAR


  
 DIRECTOR

Copy To : Supervisor, Co-Supervisor (If applicable) / Research Centre / Doctoral Committee Members






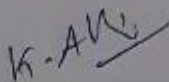
3.7.1/Collaborative Activities/2020-21/29

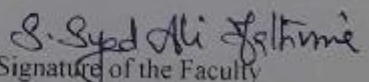
## Sadakathullah Appa College (Autonomous)

Rahmath Nagar, Tirunelveli - 627011

1	Name of the Faculty with Designation, Staff ID	Dr. S. Syed Ali Fathima Assistant Professor Department of Mathematics Sadakathullah Appa College, Tirunelveli-II Staff ID: ATMA04
2	Name of the Collaborating Faculty with Designation	Dr.K. Alli Assistant Professor Department of Mathematics The M.D.T Hindu College
3	Name of the Collaborating Organization	The M.D.T Hindu College, Tirunelveli
4	Nature of Collaboration (Academic / Research / Faculty Exchange / Student Exchange / Project / Internship / On-the Job Training)	Research
5	Nature / Details of Outcome (Guest Lecture / DC member / Co-guide / Project Reports / Other Reports/Publications)	Publications – 2021
6	Period of Collaboration	From : 10.08.2017 To: Till Date
7	Financial Involvement (if any)	No
8	Proof Attached	Yes

  
Signature of Principal  
With seal

  
Signature of the Collaborating Faculty  
With seal  
**Dr. K. ALLI, M.Sc., M.Phil., Ph.D.,**  
Assistant Professor,  
Department of Mathematics,  
The M.D.T Hindu College,  
TIRUNELVELI - 627 010

  
Signature of the Faculty  
With seal  
**S. Syed Ali Fathima**  
Assistant Professor of Mathematics,  
Sadakathullah Appa College (Autonomous),  
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## Scheduling a Semi-Round Robin Tournament using Independent Edge Domination

Turkish Online Journal of Qualitative Inquiry (TOJQI)  
Volume 12, Issue6, July, 7094-7101

Research Article

## Scheduling a Semi-Round Robin Tournament using Independent Edge Domination

H.M. Sulthan Ahthar<sup>1</sup>, S. Syed Ali Fathima<sup>2</sup>, K. Alli<sup>3</sup>

### Abstract

This paper discuss about scheduling a semi round robin tournament without equal number of matches and with equal number of matches. In this paper, we introduce a method for scheduling a semi round- robin tournament with the help of independent edge domination.

**Keywords:** Round-Robin, Domination, independent edge domination.

### 1. Introduction

Domination in graphs is the one of the most engaging area which is used by many researchers for practical problem. Sports scheduling is one of the important practical problem because many sports schedule involves organizers many, peoples time and lot more. So that, many researchers involve in scheduling sports. Here we discuss about the semi round robin tournament. A **round-robin** is a sports competition in which each player or team plays against every other player or team. The **semi-round robin** is one of the round robin tournaments where uneven divisions are scheduled. This paper discuss about scheduling a semi round robin tournament without equal number of matches and with equal number of matches. In this paper, we introduce a method for scheduling a semi round- robin tournament with the help of independent edge domination.

### 2. Definition

A **graph** is an ordered pair  $G = (V, E)$  where  $V$  is the vertex set and  $E$  is the edge set. A graph with one component is called connected graph and a graph with more than one component is a **disconnected graph**. A graph may contain loops and multiple edges are called **general graph**. Graphs with no loops or multiple edges are called **simple graphs**. A **complete graph** is a graph in which each pair of graph vertices is connected by an edge. A complete graph with  $n$  vertices denoted by ' $K_n$ ' is a graph with  $n$  vertices in which each vertex is connected to each of the others. The **degree** of a vertex  $V$  in a graph  $G$  denoted by  $d(v)$  is the number of edges incident with  $v$ . A graph in which each vertex has the same degree is a **regular graph**. If each vertex has degree  $r$ , the graph is **regular of degree  $r$**  or  **$r$ -regular**. Of special importance are the **cubic graphs**, which are regular of degree 3. A set  $D$  of vertices in a graph  $G = (V, E)$  is called a **dominating set** of  $G$  if every vertex in  $V - D$  is adjacent to some vertex in  $D$ . A set  $F$  of edges in

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<sup>2</sup>Department of Mathematics, Sadakathullah Appa College affiliated to Manonmaniam Sundaranar University, Abishekapatti, Tirunelveli – 627012, Tamil Nadu (India). syedalifathima2014@gmail.com

<sup>3</sup>Department of Mathematics, The M.D.T. Hindu College affiliated to Manonmaniam Sundaranar University, Abishekapatti, Tirunelveli – 627012, Tamil Nadu (India). allimdt@gmail.com




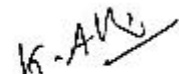


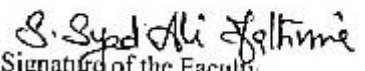
# Sadakathullah Appa College (Autonomous)

Rahmath Nagar, Tirunelveli - 627011

1	Name of the Faculty with Designation, Staff ID	Dr. S. Syed Ali Fathima Assistant Professor Department of Mathematics Sadakathullah Appa College, Tirunelveli-11 Staff ID: ATMA04
2	Name of the Collaborating Faculty with Designation	Dr.K. Alli Assistant Professor Department of Mathematics The M.D.T Hindu College
3	Name of the Collaborating Organization	The M.D.T Hindu College, Tirunelveli
4	Nature of Collaboration (Academic / Research / Faculty Exchange / Student Exchange / Project / Internship / On-the Job Training)	Research
5	Nature / Details of Outcome (Guest Lecture / DC member / Co-guide / Project Reports / Other Reports/Publications)	Publications - 2021
6	Period of Collaboration	From : 10.08.2017 To: Till Date
7	Financial Involvement (if any)	No
8	Proof Attached	Yes

  
Signature of Principal  
With seal

  
Signature of the Collaborating Faculty  
With seal  
**Dr. K. ALLI, M.Sc., M.Phil., Ph.D.,**  
Assistant Professor,  
Department of Mathematics,  
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TIRUNELVELI - 627 010

  
Signature of the Faculty  
With seal  
**S. Syed Ali Fathima**  
Assistant Professor of Mathematics,  
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Multi - Event Sport Scheduling using Independent Domination

H.M. Sulthan Ahthar<sup>1</sup>, S. Syed Ali Fathima<sup>2</sup>, K. Alli<sup>3</sup>

Abstract

In this paper work, we wish to Schedule multi events in a sport with break and without break with the help of graph using independent domination.

**Keywords:** sports scheduling, independent Domination.

1. Introduction

Scheduling Sports events is a process which is arranging of different kinds of Sports in particular timing order for convenient of players and the organizers. Schedule sports events for their convenient of players to not to clash with other events and also for the convenient of event organizers to make the event conduct in short time that is without break. In another case, one player cannot play another game immediately, the player need rest. This same will happen to another player also. Likewise variety of sports may be play by many players. For their convenient, sports events should be arranged in a particular order in common are conduct at different time with break. In this paper, we schedule the multi sports for players convenient that is player can play more than one sports with break and without break with the help of graph theory using independent domination.

2. Definition

A Set  $S$  of vertices in a graph  $G$  is a **dominating set** if every vertex in  $V - S$  is adjacent to some vertices in  $S$ . A dominating set  $S$  is an **independent dominating set** if no two vertices in  $S$  are adjacent. **Iterated domination** is a greedy algorithm which finds a minimal dominating set, say  $S_1$ . Remove  $S_1$  from  $G$ , and once again find a minimal dominating set  $S_2$  in the graph  $G - S_1$ . Remove  $S_2$  and once again find a minimal dominating set in the graph  $G - S_1 - S_2$ . Repeat this process until no vertices remain. One can also iteratively remove independent sets of vertices.

3. Scheduling sports without break using iterated independent domination

---

<sup>1</sup>Research Scholar (Reg.No. 17211072091014), Sadakathullah Appa College affiliated to Manonmaniam Sundaranar University, Abishekapatti, Tirunelveli - 627012, Tamil Nadu (India). sulthanahthar@gmail.com

<sup>2</sup>Department of Mathematics, Sadakathullah Appa College affiliated to Manonmaniam Sundaranar University, Abishekapatti, Tirunelveli - 627012, Tamil Nadu (India). syedalifathima2014@gmail.com

<sup>3</sup>Department of Mathematics, The M.D.T. Hindu College affiliated to Manonmaniam Sundaranar University, Abishekapatti, Tirunelveli - 627012, Tamil Nadu (India). allimdt@gmail.com






**Sadakathullah Appa College (Autonomous)**  
Rahmath Nagar, Tirunelveli - 627011

1	Name of the Faculty with Designation, Staff ID	: Dr. S. Syed Ali Fathima Assistant Professor Department of Mathematics Sadakathullah Appa College, Tirunelveli-11 Staff ID: ATMA04
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3	Name of the Collaborating Organization	: Sri Parasakthi College for Women, Courtallam
4	Nature of Collaboration (Academic / Research / Faculty Exchange / Student Exchange / Project / Internship / On-the Job Training)	: Research
5	Nature / Details of Outcome (Guest Lecture / DC member / Co-guide / Project Reports / Other Reports/Publications)	: DC Member - RAMA VANJ - 19221202092003
6	Period of Collaboration	: From : 18.07.2019 To: Till Date
7	Financial Involvement (if any)	: No
8	Proof Attached	: Yes

  
Signature of Principal  
With seal

  
Signature of the Collaborating Faculty  
With seal  
**Dr. R. SELVI**  
Assistant Professor of Maths  
Sri Parasakthi College for Women  
Courtallam-627 802

  
Signature of the Faculty  
S. S. Syed Ali Fathima  
Assistant Professor of Math  
Sadakathullah Appa College (A)  
Rahmath Nagar, Tirunelveli



08/2019

19221202092003\_commencement



# MANONMANIAM SUNDARANAR UNIVERSITY

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CENTRE FOR RESEARCH

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**DR. K. SENTHAMARAI KANNAN**  
DIRECTOR

REF : MSU/RES/Admn/July 2019

Date : July 18, 2019

**Ph.D., Programme Commencement Order**

To

RAMA VANI R  
4-11 VATRAVANATHAN STREET, SHENCOTTAI  
Tirunelveli, Tamil Nadu, Pincode - 627809  
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Sir/Madam,

Sub: Registration for doing Ph.D., programme - Date of Commencement of Research work -  
Intimation - Reg

Ref: Counselling attended by the candidate for July 2019 session.

\*\*\*\*\*

With reference to the above, you are provisionally registered for Ph.D., Programme as detailed below :

Name of the Scholar	RAMA VANI R
Registration No.	19221202092003
Discipline	Mathematics
Gender / Community	Female / MBC/DNC
Nationality	INDIAN
PWD Status	Not Applicable
Admission Based On / Mode	M.Phil / PART TIME
Research Centre	Sri Parasakthi College for Women, Courtallam
Name of the Supervisor with Address	Dr. R. Selvi, Assistant Professor Department of Mathematics, Sri Parasakthi College for Women (Autonomous), Courtallam, 627802 Mobile No. : 9443265852, Email ID : r.selvi/muthu@gmail.com
Name of the Co-Supervisor with Address	NIL
Doctoral Committee Members	1. DR R KALA, Professor, Department of Mathematics, Manonmaniam Sundaranar University, Tirunelveli - 627012 Mobile No. : 9400902837, Email ID : karthipylal@yahoo.com  2. DR SYEDALI FATHIMA, Assistant Professor, Department of Mathematics, Sadakathuliah Appa College, Tirunelveli Mobile No. : 9965337934, Email ID : syedalifathima2014@gmail.com
Proposed Title	A STUDY ON GENERALIZED TOPOLOGICAL NORMAL GROUPS
Date of Commencement	18.07.2019

ASSISTANT SUPERINTENDENT ASSISTANT REGISTRAR

DIRECTOR

Copy To : Supervisor, Co-Supervisor (if applicable) / Research Centre / Doctoral Committee Members





**Sadakathullah Appa College (Autonomous)**  
Rahmath Nagar, Tirunelveli - 627011

1	NAME OF THE FACULTY WITH DESIGNATION, STAFF ID	:	Dr. N. MOHAMED RILWAN ASSISTANT PROFESSOR, DEPARTMENT OF MATHEMATICS, SADAKATHULLAH APPA COLLEGE, TIRUNELVELI 627 011.
			ATMA05
2	NAME OF THE COLLABORATING FACULTY WITH DESIGNATION	:	Dr. M. P. SYEDALI NISAYA ASSISTANT PROFESSOR OF MATHEMATICS THE MDT HINDU COLLEGE, PETTAI, TIRUNELVELI 627 010
3	NAME OF THE COLLABORATING ORGANIZATION	:	THE MDT HINDU COLLEGE, PETTAI, TIRUNELVELI 627 010.
4	NATURE OF COLLABORATION (ACADEMIC / RESEARCH / FACULTY EXCHANGE / STUDENT EXCHANGE / PROJECT / INTERNSHIP / ON-THE JOB TRAINING)	:	RESEARCH
5	NATURE / DETAILS OF OUTCOME (GUEST LECTURE / DC MEMBER / CO-GUIDE / PROJECT REPORTS / OTHER REPORTS/PUBLICATIONS)	:	DOCTORAL COMMITTEE MEMBER FOR THE SCHOLAR "RAMA LAKSHMI A"
6	PERIOD OF COLLABORATION	:	JAN 2018 TO TILL
7	FINANCIAL INVOLVEMENT (IF ANY)	:	-
8	PROOF ATTACHED	:	YES

SIGNATURE OF PRINCIPAL

SIGNATURE OF THE COLLABORATING FACULTY

SIGNATURE OF FACULTY

Dr. M. P. SYEDALI NISAYA, M.Sc., M.T., Ph.D.  
Assistant Professor of Mathematics  
The M.D.T. Hindu College,  
Tirunelveli - 627 010.

Dr. N. MOHAMED RILWAN, M.Sc., Ph.D.  
Assistant Professor  
Department of Mathematics  
Sadakathullah Appa College (Autonomous)  
Tirunelveli - 627 011.



**DR. K. SENTHAMARAI KANNAN**  
**DIRECTOR**

REF : MSU/RES/R1/JANUARY2018

Date : January 10, 2018

**Ph.D., Programme Commencement Order**

To

RAMA LAKSHMI A  
 3,krishnan kovil south street , Palayam kottal  
 Tirunelveli  
 Tamil Nadu, Thirunelveli, Pincode - 627002  
 Mobile No. : 9095254552, Email ID : gurujl.ae@gmail.com

Sir/Madam,

Sub: Registration for doing Ph.D., programme - Date of Commencement of Research work -  
 Intimation - Reg


Ref: Counseling attended by the candidate.

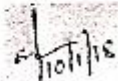
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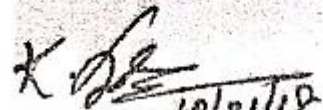
With reference to the above, you are provisionally registered for Ph.D., Programme as detailed below :

- |  |   |
|--|---|
| 1. Name of the Scholar                 | : RAMA LAKSHMI A  |
| 2. Registration No.                    | : 18121072092001  |
| 3. Discipline                          | : Mathematics   |
| 4. Gender                              | : Female  |
| 5. Social Category (Community)         | : BC  |
| 6. Nationality                         | : Indian  |
| 7. PWD Status                          | : Not Applicable  |
| 8. Admission Based On                  | : M.Phil  |
| 9. Name of the Supervisor              | : Dr. M. P. Syedali Nisaya  |
| 10. Name of the Co-Supervisor          | : NIL   |
| 11. Mode                               | : PART TIME INTERNAL  |
| 12. Research Centre                    | : The M.D.T. Hindu College, Tirunelveli   |
| 13. Date of Commencement               | : 10.01.2018  |
| 14. Proposed Title                     | : A Study on Graph Labeling   |
| 15. Doctoral Committee Members Details | : 1. DR R KALA<br>PROFESSOR OF MATHEMATICS, M S UNIVERSITY,<br>TIRUNELVELI-12<br>Mobile No. : 9486902837, Email ID : karthipyl91@yahoo.co.in<br>2. DR N MOHAMED RILWAN<br>ASSISTANT PROFESSOR OF MATHEMATICS, SADAKATHULLAH<br>APPA COLLEGE, TIRUNELVELI-11<br>Mobile No. : 7867946099, Email ID : rilwan2020@gmail.com |

  
 10/1/18  
 ASST

  
 10/1/18  
 SUPDT

  
 10/1/18  
 AR

  
 10/1/18  
 DIRECTOR





**Sadakathullah Appa College (Autonomous)**  
 Rahmath Nagar, Tirunelveli - 627011

1	Name of the Faculty with Designation, Staff ID	: <b>Dr. N. MOHAMED RILWAN</b> ASSISTANT PROFESSOR, DEPARTMENT OF MATHEMATICS, SADAKATHULLAH APPA COLLEGE, TIRUNELVELI 627 011.
		: ATMA05
2	Name of the Collaborating Faculty with Designation	: <b>Dr. K. SELVAKUMAR</b> ASSISTANT PROFESSOR OF MATHEMATICS MANONMANIAM SUNDARANAR UNIVERSITY TIRUNELVELI 627 012
3	Name of the Collaborating Organization	: MANONMANIAM SUNDARANAR UNIVERSITY TIRUNELVELI 627 012
4	Nature of Collaboration (Academic / Research / Faculty Exchange / Student Exchange / Project / Internship / On-the Job Training)	: RESEARCH
5	Nature / Details of Outcome (Guest Lecture / DC member / Co-guide / Project Reports / Other Reports/Publications)	: DOCTORAL COMMITTEE MEMBER FOR THE SCHOLAR "PETCHIAMMAL N"
6	Period of Collaboration	: JULY 2019 TO TILL
7	Financial Involvement (if any)	: -
8	Proof Attached	: YES

SIGNATURE OF PRINCIPAL

SIGNATURE OF THE COLLABORATING FACULTY

SIGNATURE OF FACULTY

**Dr. N. MOHAMED RILWAN, M.Sc, Ph.D.**  
 Assistant Professor  
 Department of Mathematics  
 Sadakathullah Appa College (Autonomous)  
 Tirunelveli - 627 011.



# MANONMANIAM SUNDARANAR UNIVERSITY

Reaccredited with 'A' Grade by NAAC (3rd Cycle)

**CENTRE FOR RESEARCH**

ABISHEKAPATTI, TIRUNELVELI - 627 012, TAMILNADU, INDIA

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**DR. K. SENTHAMARAI KANNAN**  
DIRECTOR

Date : July 24, 2019

REF : MSU/RES/Admn/July 2019

**Ph.D., Programme Commencement Order**

To

PETCHIAMMAL N  
1-113 Perumal koil Street , Kolhalgrammam  
Kanniyakumari, Tamil Nadu, Pincode - 629001  
Mobile No. : 9659759230, Email ID : akilamaha@yahoo.com

Sir/Madam,

Sub: Registration for doing Ph.D., programme - Date of Commencement of Research work -  
Intimation - Reg

Ref: Counseling attended by the candidate for July 2019 session.  
\*\*\*\*\*

With reference to the above, you are provisionally registered for Ph.D., Programme as detailed below :

Name of the Scholar	PETCHIAMMAL N
Registration No.	19214012092018
Discipline	Mathematics
Gender / Community	Female / OC
Nationality	Indian
PWD Status	Not Applicable
Admission Based On / Mode	M.Phil / PART TIME
Research Centre	Manonmaniam Sundaranar University, Tirunelveli.
Name of the Supervisor with Address	Dr. K. Selvakumar, Associate Professor Department of Mathematics, Manonmaniam Sundaranar University, Tirunelveli, 627012 Mobile No. : 9442448593, Email ID : selva_15@yahoo.co.in
Name of the Co-Supervisor with Address	NIL
Doctoral Committee Members	1. DR R KALA , Professor Dept of Mathematics M S University Tirunelveli-627012 Mobile No. : 9486902837, Email ID : karthipyl91@yahoo.co.in  2. DR N MOHAMED RILWAN, Assistant Professor Dept of Mathematics Sadakathullah Appa College Tirunelveli Mobile No. : 7867946099, Email ID : rilwan2020@gmail.com
Proposed Title	A STUDY ON GRAPHS FROM FINITE GROUPS
Date of Commencement	24.07.2019

ASSISTANT

SUPERINTENDENT

ASSISTANT REGISTRAR

DIRECTOR

Copy To : Supervisor, Co-Supervisor (If applicable) / Research Centre / Doctoral Committee Members





## Sadakathullah Appa College (Autonomous)

### Rahmath Nagar, Tirunelveli - 627011

1	Name of the Faculty with Designation, Staff ID	: <b>Dr. N. MOHAMED RILWAN</b> ASSISTANT PROFESSOR, DEPARTMENT OF MATHEMATICS, SADAKATHULLAH APPA COLLEGE, TIRUNELVELI 627 011.
		ATMAOS
2	Name of the Collaborating Faculty with Designation	: <b>Dr. K. SELVAKUMAR</b> ASSISTANT PROFESSOR OF MATHEMATICS MANONMANIAM SUNDARANAR UNIVERSITY TIRUNELVELI 627 012
3	Name of the Collaborating Organization	: MANONMANIAM SUNDARANAR UNIVERSITY TIRUNELVELI 627 012
4	Nature of Collaboration (Academic / Research / Faculty Exchange / Student Exchange / Project / Internship / On-the Job Training)	: RESEARCH
5	Nature / Details of Outcome (Guest Lecture / DC member / Co-guide / Project Reports / Other Reports/Publications)	: <b>DOCTORAL COMMITTEE MEMBER FOR THE SCHOLAR ANUSHA N</b>
6	Period of Collaboration	: JULY 2019 TO TILL
7	Financial Involvement (if any)	: -
8	Proof Attached	: YES

SIGNATURE OF PRINCIPAL

SIGNATURE OF THE COLLABORATING FACULTY

SIGNATURE OF FACULTY

**Dr. N. MOHAMED RILWAN, M.Sc., Ph.D.**  
 Assistant Professor  
 Department of Mathematics  
 Sadakathullah Appa College (Autonomous)  
 Tirunelveli - 627 011.


**MANONMANIAM SUNDARANAR UNIVERSITY**

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**CENTRE FOR RESEARCH**

ABISHEKAPATTI, TIRUNELVELI - 627 012, TAMILNADU, INDIA

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**DR. K. SENTHAMARAI KANNAN**  
**DIRECTOR**

REF : MSU/RES/Admn/July 2019

Date : July 19, 2019

**Ph.D., Programme Commencement Order**

To

 ANUSHA N  
 6-9A north Street, Pappankulam, Pottalpuhur  
 Thirunelveli, Tamil Nadu, Pincode - 627423  
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Sir/Madam,

 Sub: Registration for doing Ph.D., programme - Date of Commencement of Research work -  
 Intimation - Reg

Ref: Counseling attended by the candidate for July 2019 session.

\* \* \* \* \*

With reference to the above, you are provisionally registered for Ph.D., Programme as detailed below :

Name of the Scholar	ANUSHA N
Registration No.	19214012092020
Discipline	Mathematics
Gender / Community	Female / MBC/DNC
Nationality	Indian
PWD Status	Not Applicable
Admission Based On / Mode	M.Phil / FULL TIME
Research Centre	Manonmaniam Sundaranar University, Tirunelveli.
Name of the Supervisor with Address	Dr. K. Selvakumar, Associate Professor Department of Mathematics, Manonmaniam Sundaranar University, Tirunelveli, 627012 Mobile No. : 9442448573, Email ID : selva_158@yahoo.co.in
Name of the Co-Supervisor with Address	NIL
Doctoral Committee Members	1. DR R KALA , Professor, Department of Mathematics, Manonmaniam Sundaranar University, Tirunelveli - 627012 Mobile No. : 9486902837, Email ID : karthipy191@yahoo.co.in  2. DR N MOHAMED RILWAN, Assistant Professor, Department of Mathematics, S. A. College, Tirunelveli - 627011 Mobile No. : 7867946099, Email ID : rilwan2020@gmail.com
Proposed Title	A STUDY ON GRAPHS FROM VARIOUS GROUPS
Date of Commencement	19.07.2019

ASSISTANT

SUPERINTENDENT

ASSISTANT REGISTRAR

DIRECTOR

Copy To : Supervisor, Co-Supervisor (If applicable) / Research Centre / Doctoral Committee Members





**Sadakathullah Appa College (Autonomous)**  
Rahmath Nagar, Tirunelveli - 627011

1	NAME OF THE FACULTY WITH DESIGNATION, STAFF ID	Dr. N. MOHAMED RILWAN ASSISTANT PROFESSOR, DEPARTMENT OF MATHEMATICS, SADAKATHULLAH APPA COLLEGE, TIRUNELVELI 627 011.
		ATMA05
2	NAME OF THE COLLABORATING FACULTY WITH DESIGNATION	Dr. S. NITHYA, ASSISTANT PROFESSOR, DEPARTMENT OF MATHEMATICS, ST. XAVIER'S COLLEGE (AUTONOMOUS), PALAYAMKOTTAI 627002
3	NAME OF THE COLLABORATING ORGANIZATION	ST. XAVIER'S COLLEGE (AUTONOMOUS), PALAYAMKOTTAI 627002
4	NATURE OF COLLABORATION (ACADEMIC / RESEARCH / FACULTY EXCHANGE / STUDENT EXCHANGE / PROJECT / INTERNSHIP / ON-THE JOB TRAINING)	RESEARCH
5	NATURE / DETAILS OF OUTCOME (GUEST LECTURE / DC MEMBER / CO-GUIDE / PROJECT REPORTS / OTHER REPORTS/PUBLICATIONS)	DOCTORAL COMMITTEE MEMBER FOR THE SCHOLAR PRISI V
6	PERIOD OF COLLABORATION	DEC 2020 TO TILL
7	FINANCIAL INVOLVEMENT (IF ANY)	-
8	PROOF ATTACHED	YES

SIGNATURE OF PRINCIPAL

SIGNATURE OF THE COLLABORATING FACULTY

SIGNATURE OF FACULTY

Dr. S. Nithya  
Assistant Professor  
Department of Mathematics  
St. Xavier's College (Autonomous)  
Palayamkottai - 627 002.

Dr. N. MOHAMED RILWAN, M.S., Ph.D.  
Assistant Professor  
Department of Mathematics  
Sadakathullah Appa College (Autonomous)  
Tirunelveli - 627 011.


**MANONMANIAM SUNDARANAR UNIVERSITY**

Reaccredited with 'A' Grade by NAAC (3rd Cycle)

**CENTRE FOR RESEARCH**

ABISHEKAPATTI, TIRUNELVELI - 627 012, TAMILNADU, INDIA

Phone : 0462 2333741, 9487907000, Intercom : 2383073, Mail: cfrmsu@msuniv.ac.in, web: msuniv.ac.in


**DR. C. KANNAN**  
 DIRECTOR

REF: MSU/RES/Admn/July 2020 Session

Date: December 30, 2020

**Ph.D. Programme Commencement Order**

To

 PRISCI V  
 S-139 Karavel Nadar Street, Arudayanoor  
 Thirunelveli, Tamil Nadu, Pincode - 627808  
 Mobile No.: 8608553027, Email ID: priscivictor97@gmail.com


Sir/Madam,

Sub: Registration for doing Ph.D. programme - Date of Commencement of Research work - Intimation - reg.

Ref: Counselling attended by the candidate for July 2020 session.

\*\*\*\*\*

With reference to the above, you are provisionally registered for Ph.D. Programme as detailed below:

Name of the Scholar	PRISCI V
Registration No.	20211282092020
Discipline	Mathematics
Gender & Community	Female & BC
Nationality	INDIAN
PWD Status	Not Applicable
Admission Based On & Mode	PG & FULL TIME
Research Centre	St. Xaviers College (Autonomous), Tirunelveli
Name of the Supervisor with Address	Dr. S. Nithya, Assistant Professor Department of Mathematics, St. Xavier's College (Autonomous), Palayamkottai, 627002 Mobile No.: 9443841986, Email ID: nithyasxc@gmail.com
Name of the Co-Supervisor with Address	NIL
Doctoral Committee Members	1. DR S BALAMURUGAN, Assistant Professor, Department of Mathematics, St. Xavier's College, Palayamkottai-627002. Mobile No.: 9787274004, Email ID: balamaths@rocketmail.com 2. DR N MOHAMED RILWAN, Assistant Professor, Department of Mathematics, Sadakathullah Appa College, Tirunelveli-627011. Mobile No.: 7867946099, Email ID: rilwan2020@gmail.com
Proposed Title	THE METRIC DIMENSION OF GRAPHS FROM RINGS
Date of Commencement	30.12.2020

  
 ASSISTANT


  
 SUPERINTENDENT


  
 ASSISTANT REGISTRAR


  
 DIRECTOR

Copy To: Supervisor, Co-Supervisor (if applicable) / Research Centre / Doctoral Committee Members





## Sadakathullah Appa College (Autonomous)

Rahmath Nagar, Tirunelveli - 627011

1	NAME OF THE FACULTY WITH DESIGNATION, STAFF ID	Dr. N. MOHAMED RILWAN ASSISTANT PROFESSOR, DEPARTMENT OF MATHEMATICS, SADAKATHULLAH APPA COLLEGE, TIRUNELVELI 627 011.
		ATMA05
2	NAME OF THE COLLABORATING FACULTY WITH DESIGNATION	Dr. T. TAMIZH CHELVAM PROFESSOR, DEPARTMENT OF MATHEMATICS MANONMANIAM SUNDARANAR UNIVERSITY TIRUNELVELI 627 012
3	NAME OF THE COLLABORATING ORGANIZATION	MANONMANIAM SUNDARANAR UNIVERSITY TIRUNELVELI 627 012
4	NATURE OF COLLABORATION (ACADEMIC / RESEARCH / FACULTY EXCHANGE / STUDENT EXCHANGE / PROJECT / INTERNSHIP / ON-THE JOB TRAINING)	RESEARCH
5	NATURE / DETAILS OF OUTCOME (GUEST LECTURE / DC MEMBER / CO-GUIDE / PROJECT REPORTS / OTHER REPORTS/PUBLICATIONS)	DOCTORAL COMMITTEE MEMBER FOR THE SCHOLAR NIRMALA V
6	PERIOD OF COLLABORATION	DEC 2018 TO TILL
7	FINANCIAL INVOLVEMENT (IF ANY)	-
8	PROOF ATTACHED	YES

SIGNATURE OF PRINCIPAL

SIGNATURE OF THE COLLABORATING FACULTY

SIGNATURE OF FACULTY

**Dr. T. TAMIZH CHELVAM**  
CSIR EMERITUS SCIENTIST  
Formerly Senior Professor  
Department of Mathematics  
Manonmaniam Sundaranar University  
Tirunelveli 627012, Tamil Nadu

**Dr. N. MOHAMED RILWAN, M.Sc., Ph.D.**  
Assistant Professor  
Department of Mathematics  
Sadakathullah Appa College (Autonomous)  
Tirunelveli - 627 011.

2018

MSU PhD Admission 19134012092044


**MANONMANIAM SUNDARANAR UNIVERSITY**

Reaccredited with 'A' Grade by NAAC (3rd Cycle)

CENTRE FOR RESEARCH

ABISHEKAPATTI, TIRUNELVELI - 627 012, TAMILNADU, INDIA

Phone : 0462 - 2333741, 9447902009, Intercom: 2563073, Mail: cfmsu@msuniv.ac.in, web: msuniv.ac.in


**DR. K. SENTHAMARAI KANNAN**  
**DIRECTOR**

REF : MSU/RES/Admn/Jan 2019

Date : December 22, 2018

**Ph.D., Programme Commencement Order**

To  
**V NIRMALA**  
 Pallanki Village, Gantiyada  
 Andhra Pradesh, Vizianagaram, Pincode - 535215  
 Mobile No. : 9442483908, Email ID : varid.nirmala@gmail.com

Sir/Madam,

 Sub: Registration for doing Ph.D., programme - Date of Commencement of Research work -  
 Intimation - Reg

Ref: Counselling attended by the candidate for January 2019 session.

\*\*\*\*\*

With reference to the above, you are provisionally registered for Ph.D., Programme as detailed below :

Name of the Scholar	V NIRMALA
Registration No.	19134012092044
Discipline	Mathematics
Gender / Community	Female / BC
Nationality	Indian
PWD Status	Not Applicable
Admission Based On / Mode	PG / PART TIME EXTERNAL
Research Centre	Manonmaniam Sundaranar University, Tirunelveli.
Name of the Supervisor	Dr. T. Tamizh Chelvam, Department of Mathematics, Department of Mathematics, MSU Mobile No. : 9443455244, Email ID : tamche59@gmail.com
Name of the Co-Supervisor	NIL
Doctoral Committee Members	<p>1. DR SELVAKUMAR, Asst Prof of Maths, M S University, Tirunelveli, Mobile No. : 9442448593, Email ID : selva_15@yahoo.co.in</p> <p>2. DR MOHAMED RILWAN, Asst Prof of Maths, S A Collage, Tirunelveli. Mobile No. : 7857946099, Email ID : rilwan2020@gmail.com</p>
Proposed Title	research on algebra
Date of Commencement	22.12.2018

ASSISTANT SUPERINTENDENT

ASSISTANT REGISTRAR

DIRECTOR

Copy To : Supervisor, Co-Supervisor (If applicable) / Research Centre / Doctoral Committee Members





**Sadakathullah Appa College (Autonomous)**  
Rahmath Nagar, Tirunelveli - 627011

1	NAME OF THE FACULTY WITH DESIGNATION, STAFF ID	:	<b>Dr. N. MOHAMED RILWAN</b> ASSISTANT PROFESSOR, DEPARTMENT OF MATHEMATICS, SADAKATHULLAH APPA COLLEGE, TIRUNELVELI 627 011.
			ATMA05
2	NAME OF THE COLLABORATING FACULTY WITH DESIGNATION	:	<b>Dr. T. TAMIZH CHELVAM</b> PROFESSOR, DEPARTMENT OF MATHEMATICS MANONMANIAM SUNDARANAR UNIVERSITY TIRUNELVELI 627 012
3	NAME OF THE COLLABORATING ORGANIZATION	:	MANONMANIAM SUNDARANAR UNIVERSITY TIRUNELVELI 627 012
4	NATURE OF COLLABORATION (ACADEMIC / RESEARCH / FACULTY EXCHANGE / STUDENT EXCHANGE / PROJECT / INTERNSHIP / ON-THE JOB TRAINING)	:	RESEARCH
5	NATURE / DETAILS OF OUTCOME (GUEST LECTURE / DC MEMBER / CO-GUIDE / PROJECT REPORTS / OTHER REPORTS/PUBLICATIONS)	:	DOCTORAL COMMITTEE MEMBER FOR THE SCHOLAR PRABHA ANANTHI K
6	PERIOD OF COLLABORATION	:	JULY 2018 TO TILL
7	FINANCIAL INVOLVEMENT (IF ANY)	:	-
8	PROOF ATTACHED	:	YES

  
SIGNATURE OF PRINCIPAL

  
SIGNATURE OF THE COLLABORATING FACULTY

  
SIGNATURE OF FACULTY

**Dr. T. TAMIZH CHELVAM**  
CSIR EMERITUS SCIENTIST  
Formerly Senior Professor  
Department of Mathematics  
Manonmaniam Sundaranar University,  
Tirunelveli 627012, Tamil Nadu

**Dr. N. MOHAMED RILWAN, M.Sc., Ph.D.**  
Assistant Professor  
Department of Mathematics  
Sadakathullah Appa College (Autonomous)  
Tirunelveli - 627 011.



MANONMANIAM SUNDARANAR UNIVERSITY  
Accredited with 'B' Grade by NAAC  
ABISHEKAPATTI, TIRUNELVELI - 627 012, TAMILNADU, INDIA  
Centre for Research



Dr.K.SENTHAMARAI KANNAN  
DIRECTOR

REF:MSU/RES/RI/JULY 2018

Date : 05-July-2018

**Ph.D., Programme Commencement Order**

To

PRABHA ANANTHI K  
7-22 East Street, Sakkamalpuram  
Servaikaranmadam post  
Thoothukudi Tamil Nadu 628103  
Mobile No :8939729285 ,Email Id :ksprabhaananthi@gmail.com

Sir/Madam,

Sub: Registration for doing Ph.D., programme - Date of Commencement of Research work - Intimation-Reg

Ref: Counseling attended by the candidate.

With reference to the above, you are provisionally registered for Ph.D., Programme as detailed below :

- |  |  |
|--|--|
| 1. Name of the Scholar                 | : PRABHA ANANTHI K   |
| 2. Registration No                     | : 18214012092020   |
| 3. Discipline                          | : Mathematics  |
| 4. Gender                              | : Female   |
| 5. Social Category (Community)         | : BC   |
| 6. Nationality                         | : Indian   |
| 7. PWD Status                          | : Not Applicable   |
| 8. Admission Based On                  | : M.Phil   |
| 9. Name of the Supervisor              | : Dr. T. Tamizh Chelvam  |
| 10. Name of the Co-Supervisor          | : NIL  |
| 11. Mode                               | : FULL TIME  |
| 12. Research Centre                    | : MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI.  |
| 13. Date of Commencement               | : 05.07.2018   |
| 14. Proposed Title                     | : A STUDY ON GRAPHS FROM VECTOR SPACES   |
| 15. Doctoral Committee Members Details | : 1. DR R KALA<br>PROFESSOR, DEPARTMENT OF MATHEMATICS, MS UNIVERSITY,<br>TIRUNELVELI-12<br><br>2. DR. RILWAN<br>ASSISTANT PROFESSOR, MATHEMATICS, SADAKATHULLA APPA COLLEGE,<br>TIRUNELVELI |

ASSISTANT

SUPERINTENDENT

ASSISTANT REGISTRAR

DIRECTOR





**Sadakathullah Appa College (Autonomous)**  
Rahmath Nagar, Tirunelveli - 627011

1	NAME OF THE FACULTY WITH DESIGNATION, STAFF ID	: Dr. N. MOHAMED RILWAN ASSISTANT PROFESSOR, DEPARTMENT OF MATHEMATICS, SADAKATHULLAH APPA COLLEGE, TIRUNELVELI 627 011.
		ATMA05
2	NAME OF THE COLLABORATING FACULTY WITH DESIGNATION	: The Principal, G.V. Naidu College
3	NAME OF THE COLLABORATING ORGANIZATION	: PG & RESEARCH DEPARTMENT OF MATHEMATICS G. VENKATASWAMY NAIDU COLLEGE KOVILPATTI - 628 502
4	NATURE OF COLLABORATION (ACADEMIC / RESEARCH / FACULTY EXCHANGE / STUDENT EXCHANGE / PROJECT / INTERNSHIP / ON-THE JOB TRAINING)	: FACULTY EXCHANGE
5	NATURE / DETAILS OF OUTCOME (GUEST LECTURE / DC MEMBER / CO-GUIDE / PROJECT REPORTS / OTHER REPORTS/PUBLICATIONS)	: RESOURCE PERSON
6	PERIOD OF COLLABORATION	: 09 - 03 - 2021
7	FINANCIAL INVOLVEMENT (IF ANY)	: -
8	PROOF ATTACHED	: YES

SIGNATURE OF PRINCIPAL

SIGNATURE OF THE COLLABORATING FACULTY

SIGNATURE OF FACULTY

PRINCIPAL In-charge  
G.VENKATASWAMY NAIDU COLLEGE  
KOVILPATTI - 628 502.

Dr. N. MOHAMED RILWAN, M.Sc., Ph.D  
Assistant Professor  
Department of Mathematics  
Sadakathullah Appa College (Autonomous)  
Tirunelveli - 627 011.



# G. VENKATASWAMY NAIDU COLLEGE

(An Autonomous Institution Affiliated to Manonmaniam Sundaranar University)

(Reaccredited with "A" Grade by NAAC & STAR College by DBT Govt. of India)

KOVILPATTI 628 502. (TAMIL NADU)

Ph: +91-4632 220389 Cell : 83009 20389

e-mail : gvncollegeoffice@gvncollege.edu.in

Web: www.gvncollege.org

Under the Management of the Kuppaswamy Naidu Charity Trust for Education & Medical Relief Coimbatore

Dr. N.R. Santhi Maheswari, M.Sc., M.Phil., Ph.D.

Principal in-charge

Date: 09.03.2021

## ATTENDANCE CERTIFICATE

This is to certify that **Dr. N.Mohamed Rilwan**, Assistant Professor, Department of Mathematics, Sadakathullah Appa College, Tirunelveli has acted as a Resource Person for the DBT sponsored Students Enrichment Programme - Two Days Workshop on LATEX organized by PG & Research Department of Mathematics, G. Venkataswamy Naidu College, Kovilpatti on 9<sup>th</sup> March 2021.

*N.R. Santhi Maheswari*  
PRINCIPAL in-charge 09/03/2021  
G.VENKATASWAMY NAIDU COLLEGE  
KOVILPATTI - 628 502





## Sadakathullah Appa College (Autonomous)

Rahmath Nagar, Tirunelveli - 627011

1	NAME OF THE FACULTY WITH DESIGNATION, STAFF ID	:	<b>Dr. N. MOHAMED RILWAN</b> ASSISTANT PROFESSOR, DEPARTMENT OF MATHEMATICS, SADAKATHULLAH APPA COLLEGE, TIRUNELVELI 627 011.
			ATMA05
2	NAME OF THE COLLABORATING FACULTY WITH DESIGNATION	:	<b>Dr. S. ANANTHALAKSHMI</b> ASSISTANT PROFESSOR, DEPARTMENT OF MATHEMATICS ANNAI HAJIRA WOMEN'S COLLEGE MELAPALAYAM, TIRUNELVELI 627 012
3	NAME OF THE COLLABORATING ORGANIZATION	:	<b>GOVINDAMMAL ADITANAR COLLEGE,</b> TIRUCHENDUR
4	NATURE OF COLLABORATION (ACADEMIC / RESEARCH / FACULTY EXCHANGE / STUDENT EXCHANGE / PROJECT / INTERNSHIP / ON-THE JOB TRAINING)	:	RESEARCH
5	NATURE / DETAILS OF OUTCOME (GUEST LECTURE / DC MEMBER / CO-GUIDE / PROJECT REPORTS / OTHER REPORTS/PUBLICATIONS)	:	<b>DOCTORAL COMMITTEE MEMBER FOR THE SCHOLAR "RADHA M"</b>
6	PERIOD OF COLLABORATION	:	DEC 2018 TO TILL
7	FINANCIAL INVOLVEMENT (IF ANY)	:	-
8	PROOF ATTACHED	:	YES

SIGNATURE OF PRINCIPAL

SIGNATURE OF THE COLLABORATING FACULTY

SIGNATURE OF FACULTY

Head of the Department  
of Mathematics  
Annai Hajira Women's College  
- Melapalayam

**Dr. N. MOHAMED RILWAN, M.Sc. Ph.D.**  
Assistant Professor  
Department of Mathematics  
Sadakathullah Appa College (Autonomous)  
Tirunelveli - 627 011.


**MANONMANIAM SUNDARANAR UNIVERSITY**

Reaccredited with 'A' Grade by NAAC (3rd Cycle)

**CENTRE FOR RESEARCH**

ABISHEKAPATTI, TIRUNELVELI - 627 012, TAMILNADU, INDIA

Phone : 0462 - 2333741, 9487907000, Intercom: 2563073, Mail: cfrrmsu@msuniv.ac.in, web: msuniv.ac.in


**DR. K. SENTHAMARAI KANNAN**  
**DIRECTOR**

Date : December 23, 2018

REF : MSU/RES/Admn/Jan 2019

**Ph.D., Programme Commencement Order**

To

 RADHA M  
 90, ELANGO NAGAR, VANNARPETTAI  
 Tamil Nadu, Thirunelveli, Pincode - 627003  
 Mobile No. : 9489034789, Email ID : radhu1987@gmail.com

Sir/Madam,

 Sub: Registration for doing Ph.D., programme - Date of Commencement of Research work -  
 Intimation - Reg

Ref: Counseling attended by the candidate for January 2019 session.

\* \* \* \* \*

With reference to the above, you are provisionally registered for Ph.D., Programme as detailed below :

Name of the Scholar	RADHA M
Registration No.	19122072092003
Discipline	Mathematics
Inter Disciplinary Detail	Operations Research
Gender / Community	Female / SC
Nationality	INDIAN
PWD Status	Not Applicable
Admission Based On / Mode	M.Phil / PART TIME INTERNAL
Research Centre	Govindammal Aditanar College, Tiruchendur
Name of the Supervisor	DR S ANANTHALAKSHMI, Department of Statistics, Annai Hajira Womens college, Melapalayam Mobile No. : 9965884104, Email ID : ananthivasan@gmail.com
Name of the Co-Supervisor	DR.R.USHA PARAMESWARI, Department of Mathematics, Govindammal Aditanar College for Women, Tiruchendur Mobile No. : 7598843944, Email ID : rushaparameswari@gmail.com
Doctoral Committee Members	1. DR N MOHAMED RILWAN, Assistant professor, Mathematics, Sadakathullah Appa College, Tirunelveli,627011 Mobile No. : 7867946099, Email ID : rilwan2020@gmail.com  2. DR J GOLDEN EBENEZER JEBAMANI, Assistant Professor, Mathematics, Sarah Tucker College, Tirunelveli,627007 Mobile No. : 7486791719, Email ID : goldensambeth@gmail.com
Proposed Title	APPLICATIONS OF OPTIMIZATION IN AIRCRAFT INDUSTRY
Date of Commencement	23.12.2018

ASSISTANT SUPERINTENDENT ASSISTANT REGISTRAR

DIRECTOR

Copy To : Supervisor, Co-Supervisor (if applicable) / Research Centre / Doctoral Committee Members





**Sadakathullah Appa College (Autonomous)**  
Rahmath Nagar, Tirunelveli - 627011

1	NAME OF THE FACULTY WITH DESIGNATION, STAFF ID	: Dr. N. MOHAMED RILWAN ASSISTANT PROFESSOR, DEPARTMENT OF MATHEMATICS, SADAKATHULLAH APPA COLLEGE, TIRUNELVELI 627 011.
		ATMA05
2	NAME OF THE COLLABORATING FACULTY WITH DESIGNATION	: Dr. S. ANANTHALAKSHMI ASSISTANT PROFESSOR, DEPARTMENT OF MATHEMATICS ANNAI HAJIRA WOMEN'S COLLEGE MELAPALAYAM, TIRUNELVELI 627 012
3	NAME OF THE COLLABORATING ORGANIZATION	: GOVINDAMMAL ADITANAR COLLEGE, TIRUCHENDUR
4	NATURE OF COLLABORATION (ACADEMIC / RESEARCH / FACULTY EXCHANGE / STUDENT EXCHANGE / PROJECT / INTERNSHIP / ON-THE JOB TRAINING)	: RESEARCH
5	NATURE / DETAILS OF OUTCOME (GUEST LECTURE / DC MEMBER / CO-GUIDE / PROJECT REPORTS / OTHER REPORTS/PUBLICATIONS)	: DOCTORAL COMMITTEE MEMBER FOR THE SCHOLAR "VIJILA S"
6	PERIOD OF COLLABORATION	: DEC 2018 TO TILL
7	FINANCIAL INVOLVEMENT (IF ANY)	: -
8	PROOF ATTACHED	: YES

SIGNATURE OF PRINCIPAL

SIGNATURE OF THE COLLABORATING FACULTY

SIGNATURE OF FACULTY

Head of the Department of  
Mathematics  
Annai Hajira Women's College  
Melapalayam

Dr. N. MOHAMED RILWAN, M.Sc., Ph.D.,  
Assistant Professor  
Department of Mathematics  
Sadakathullah Appa College (Autonomous)  
Tirunelveli - 627 011.



# MANONMANIAM SUNDARANAR UNIVERSITY

Reaccredited with 'A' Grade by NAAC (3rd Cycle)

**CENTRE FOR RESEARCH**

ABISHEKAPATTI, TIRUNELVELI - 627 012, TAMILNADU, INDIA

Phone : 0462 - 2333741, 9487907000, Intercom: 2563073, Mail: cfmsu@msuniv.ac.in, web: msuniv.ac.in



**DR. K. SENTHAMARAI KANNAN**  
**DIRECTOR**

REF : MSU/RES/Admn/Jan 2019

Date : December 20, 2018

**Ph.D., Programme Commencement Order**

To

VIJILA S  
NO 77, MUNIYASAMY PURAM, FIRST STREET  
THOOTHUKUDI  
Tamil Nadu, Thoothukudi, Pincode - 628003  
Mobile No. : 9150631781, Email ID : vijilapaulraj@gmail.com

Sir/Madam,

Sub: Registration for doing Ph.D., programme - Date of Commencement of Research work -  
Intimation - Reg

Ref: Counseling attended by the candidate for January 2019 session.

\*\*\*\*\*

With reference to the above, you are provisionally registered for Ph.D., Programme as detailed below :

Name of the Scholar	VIJILA S
Registration No.	19122072092001
Discipline	Mathematics
Inter Disciplinary Detail	Nil
Gender / Community	Female / BC
Nationality	INDIAN
PWD Status	Not Applicable
Admission Based On / Mode	M.Phil / PART TIME INTERNAL
Research Centre	Govindammal Aditanar College, Tiruchendur
Name of the Supervisor	DR ANANTHALAKSHMI, Department of Mathematics, Govindammal Aditanar College for Women, Tiruchendur Mobile No. : 9965884104, Email ID : ananthisvasan@gmail.com
Name of the Co-Supervisor	DR M KALAISELVI, Department of Mathematics, Govindammal Aditanar College for Women, Tiruchendur Mobile No. : 8778748141, Email ID : kesrlharan@gmail.com
Doctoral Committee Members	1. DR USHA PARAMESHWARI, ASSISTANT PROFESSOR, MATHEMATICS, GOVINDAMMAL ADITHANAR COLLEGE FOR WOMEN, TIRUCHENDURE. Mobile No. : 7598843944, Email ID : rushaparameswar@gmail.com 2. DR N MOHAMED RITWAN, ASSISTANT PROFESSOR, MATHEMATICS, SADAKATHULLAH APPA COLLEGE, TIRUNELVELI. Mobile No. : 7867846099, Email ID : ritwan2020@gmail.com
Proposed Title	MATHEMATICAL ANALYSIS FOR FUZZY OPTIMIZATION
Date of Commencement	20.12.2018

ASSISTANT

SUPERINTENDENT

ASSISTANT REGISTRAR

DIRECTOR

Copy To : Supervisor, Co-Supervisor (if applicable) / Research Centre / Doctoral Committee Members





**Sadakathullah Appa College (Autonomous)**  
Rahmath Nagar, Tirunelveli - 627011

1	NAME OF THE FACULTY WITH DESIGNATION, STAFF ID	:	Dr. N. MOHAMED RILWAN ASSISTANT PROFESSOR, DEPARTMENT OF MATHEMATICS, SADAKATHULLAH APPA COLLEGE, TIRUNELVELI 627 011.
			ATMA05
2	NAME OF THE COLLABORATING FACULTY WITH DESIGNATION	:	Dr. S. ANANTHALAKSHMI ASSISTANT PROFESSOR, DEPARTMENT OF MATHEMATICS ANNAI HAJIRA WOMEN'S COLLEGE MELAPALAYAM, TIRUNELVELI 627 012
3	NAME OF THE COLLABORATING ORGANIZATION	:	GOVINDAMMAL ADITANAR COLLEGE, TIRUCHENDUR
4	NATURE OF COLLABORATION (ACADEMIC / RESEARCH / FACULTY EXCHANGE / STUDENT EXCHANGE / PROJECT / INTERNSHIP / ON-THE JOB TRAINING)	:	RESEARCH
5	NATURE / DETAILS OF OUTCOME (GUEST LECTURE / DC MEMBER / CO-GUIDE / PROJECT REPORTS / OTHER REPORTS/PUBLICATIONS)	:	DOCTORAL COMMITTEE MEMBER FOR THE SCHOLAR "MARY HELEN MEERA BHAI"
6	PERIOD OF COLLABORATION	:	DEC 2018 TO TILL
7	FINANCIAL INVOLVEMENT (IF ANY)	:	-
8	PROOF ATTACHED	:	YES

SIGNATURE OF PRINCIPAL

SIGNATURE OF THE COLLABORATING FACULTY

SIGNATURE OF FACULTY

Head of the Department of  
Mathematics  
Annai Hajira Women's College  
Melapalayam

Dr. N. MOHAMED RILWAN, M.Sc.P  
Assistant Professor  
Department of Mathematics  
Sadakathullah Appa College (Autonomous)  
Tirunelveli - 627 011.


**MANONMANIAM SUNDARANAR UNIVERSITY**

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**CENTRE FOR RESEARCH**

ABISHEKAPATTI, TIRUNELVELI - 627 012, TAMILNADU, INDIA

Phone : 0452 - 2333741, 9487907000, Intercom: 2561073, Mail: cfmsu@msuniv.ac.in, web: msuniv.ac.in


**DR. K. SENTHAMARAI KANNAN**  
**DIRECTOR**

REF : MSU/RES/Admn/Jan 2019

Date : December 22, 2018

**Ph.D., Programme Commencement Order**

To

**MARY HELEN MEERA BAI**  
 2161 MELASHUNMUGAPURAM, 2ND STREET  
 THOOTHUKUDI  
 Tamil Nadu, Thoothukudi, Pincode - 628003  
 Mobile No. : 7598048522, Email ID : maryhelenmeerabal@gmail.com

Sir/Madam,

 Sub: Registration for doing Ph.D., programme - Date of Commencement of Research work -  
 Intimation - Reg

Ref: Counselling attended by the candidate for January 2019 session.

\* \* \* \* \*

With reference to the above, you are provisionally registered for Ph.D., Programme as detailed below :

Name of the Scholar	MARY HELEN MEERA BAI
Registration No.	19122072092002
Discipline	Mathematics
Gender / Community	Female / BC
Nationality	INDIAN
PWD Status	Not Applicable
Admission Based On / Mode	M.Phil / PART TIME INTERNAL
Research Centre	Govindammal Aditanar College, Tiruchendur
Name of the Supervisor	DR S ANANTHALAKSHMI, Department of Mathematics, Annai Hajira Womens college, Melapalayam Mobile No. : 9965884104, Email ID : ananthisvasan@gmail.com
Name of the Co-Supervisor	DR M KALAISELVI, Department of Mathematics, Govindammal Aditanar College for Women, Tiruchendur Mobile No. : 8778748141, Email ID : kesritharan@gmail.com
Doctoral Committee Members	1. DR S ALICE PAPPA, ASSOCIATE PROFESSOR OF MATHEMATICS MARGOSCHIS COLLEGE NAZARATH Mobile No. : 7548827835, Email ID : alicestephen8979@gmail.com 2. DR N MOHAMED RITWAN, ASSISTANT PROFESSOR OF MATHEMATICS SADAKATHALLAH APPA COLLEGE TIRUNELVELI Mobile No. : 7867946099, Email ID : ritwan2020@gmail.com
Proposed Title	APPLICATION OF OPTIMIZATION IN MATHEMATICAL ANALYSIS
Date of Commencement	22.12.2018

ASSISTANT SUPERINTENDENT ASSISTANT REGISTRAR

DIRECTOR

Copy To : Supervisor, Co-Supervisor (If applicable) / Research Centre / Doctoral Committee Members






**Sadakathullah Appa College (Autonomous)**  
Rahmath Nagar, Tirunelveli - 627011

1	Name of the Faculty with Designation, Staff ID	: <b>Dr. N. MOHAMED RILWAN</b> ASSISTANT PROFESSOR, DEPARTMENT OF MATHEMATICS, SADAKATHULLAH APPA COLLEGE, TIRUNELVELI 627 011.
		ATMA05
2	Name of the Collaborating Faculty with Designation	: <b>Dr. K. SELVAKUMAR</b> ASSISTANT PROFESSOR OF MATHEMATICS MANONMANIAM SUNDARANAR UNIVERSITY TIRUNELVELI 627 012
3	Name of the Collaborating Organization	: MANONMANIAM SUNDARANAR UNIVERSITY TIRUNELVELI 627 012
4	Nature of Collaboration {Academic / Research / Faculty Exchange / Student Exchange / Project / Internship / On-the Job Training}	: RESEARCH
5	Nature / Details of Outcome {Guest Lecture / DC member / Co-guide / Project Reports / Other Reports/Publications}	: <b>DOCTORAL COMMITTEE MEMBER FOR THE SCHLAR BEAUTLIN JEMI J</b>
6	Period of Collaboration	: JULY 2018 TO TILL
7	Financial Involvement (if any)	: -
8	Proof Attached	: YES

  
SIGNATURE OF PRINCIPAL

  
SIGNATURE OF THE COLLABORATING FACULTY

  
SIGNATURE OF FACULTY

**Dr. N. MOHAMED RILWAN, M.Sc., Ph.D**  
Assistant Professor  
Department of Mathematics  
Sadakathullah Appa College (Autonomous)  
Tirunelveli - 627 011.



MANONMANIAM SUNDARANAR UNIVERSITY  
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ABISHEKAPATTI, TIRUNELVELI - 627 012, TAMILNADU, INDIA  
Centre for Research



Dr.K.SENTHAMARAI KANNAN  
DIRECTOR

REF:MSU/RES/RI/JULY 2018

Date : 05-July-2018

**Ph.D., Programme Commencement Order**

To

BEAUTLIN JEMI J  
2-7, KATTAIKAL VILAI, THIRUVATTAR POST

Kanniyakumari Tamil Nadu 629177  
Mobile No :9524638936 ,Email Id :beautlinjemi09@gmail.com

Sir/Madam,

Sub: Registration for doing Ph.D., programme - Date of Commencement of Research work - Intimation-Reg

Ref: Counseling attended by the candidate.

\* \* \* \* \*

With reference to the above, you are provisionally registered for Ph.D., Programme as detailed below :

1. Name of the Scholar : BEAUTLIN JEMI J
2. Registration No : 18214012092019
3. Discipline : Mathematics
4. Gender : Female
5. Social Category (Community) : BC
6. Nationality : Indian
7. PWD Status : Not Applicable
8. Admission Based On : M.Phil
9. Name of the Supervisor : Dr. K. Selvakumar
10. Name of the Co-Supervisor : NIL
11. Mode : FULL TIME
12. Research Centre : MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI.
13. Date of Commencement : 05.07.2018
14. Proposed Title : A STUDY ON K-UNIIFORM HYPERGRAPHS FROM COMMUTATIVE RINGS
15. Doctoral Committee Members Details :
  1. DR S MONIKANDAN  
ASSISTANT PROFESSOR, DEPARTMENT OF MATHEMATICS, MS UNIVERSITY, TIRUNELVELI
  2. DR N MOHEMED RILWAN  
ASSISTANT PROFESSOR, DEPARTMENT OF MATHEMATICS, SADAKATTIYULLAIAPPA COLLEGE, PALAYAMKOTTAI, TIRUNELVELI

  
ASSISTANT

  
SUPERINTENDENT

  
ASSISTANT REGISTRAR

  
DIRECTOR





**Sadakathullah Appa College (Autonomous)**  
Rahmath Nagar, Tirunelveli - 627011

1	NAME OF THE FACULTY WITH DESIGNATION, STAFF ID	: <b>Dr. N. MOHAMED RILWAN</b> ASSISTANT PROFESSOR, DEPARTMENT OF MATHEMATICS, SADAKATHULLAH APPA COLLEGE, TIRUNELVELI 627 011.
		ATMA05
2	NAME OF THE COLLABORATING FACULTY WITH DESIGNATION	: The Head Master, R.C.Government Hr. Sec. School
3	NAME OF THE COLLABORATING ORGANIZATION	: ROSALIND CHELLIAH GOVERNMENT HIGHER SECONDARY SCHOOL, MARUTHAKULAM TIRUNELVELI – 627 151
4	NATURE OF COLLABORATION (ACADEMIC / RESEARCH / FACULTY EXCHANGE / STUDENT EXCHANGE / PROJECT / INTERNSHIP / ON-THE JOB TRAINING)	: ACADEMICS
5	NATURE / DETAILS OF OUTCOME (GUEST LECTURE / DC MEMBER / CO- GUIDE / PROJECT REPORTS / OTHER REPORTS/PUBLICATIONS)	: ATAL ESTABLISHMENT COMMITTEE MEMBER
6	PERIOD OF COLLABORATION	: 05 – 03 – 2021
7	FINANCIAL INVOLVEMENT (IF ANY)	: -
8	PROOF ATTACHED	: YES

SIGNATURE OF PRINCIPAL      SIGNATURE OF THE COLLABORATING FACULTY      SIGNATURE OF FACULTY

*[Signature]*  
HEADMASTER  
R.C. GOVT. HR. SEC. SCHOOL  
MARUTHAKULAM  
TIRUNELVELI - 627151

*[Signature]*  
**Dr. N. MOHAMED RILWAN, M.Sc., Ph.D.**  
Assistant Professor  
Department of Mathematics  
Sadakathullah Appa College (Autonomous)  
Tirunelveli - 627 011.

3.7.1/Collaborative Activities/2020-21/43

**ROSALIND CHELLIAH GOVERNMENT HIGHER SECONDARY SCHOOL,**

**MARUTHAKULAM, TIRUNELVELI DISTRICT - 627 151**

### **Attendance Certificate**

This is to certify that **Dr. N. MOHAMED RILWAN**, Assistant Professor, Department of Mathematics, Sadakathullah Appa College, Tirunelveli, has participated in the Atal Establishment committee meeting held at Rosalind Chelliah Government Higher Secondary School, Maruthakulam, On 05/03/2021.



  
HEAD MASTER  
HEADMASTER  
R.C. GOVT. HR. SEC. SCHOOL  
MARUTHAKULAM  
TIRUNELVELI - 627151





**Sadakathullah Appa College**  
**(Autonomous)**  
Rahmath Nagar, Tirunelveli - 627011

1	Name of the Faculty with Designation, Staff ID	: <b>Dr. I. ANTONY DANISH</b> Assistant Professor, Department of Chemistry ATCH05
2	Name of the Collaborating Faculty with Designation	: <b>Dr. J. WINFRED JEBARAJ</b> Assistant Professor, Department of Chemistry, St. John's College, Palayamkottai, Tirunelveli 627002
3	Name of the Collaborating Organization	: Department of Chemistry, St. John's College, Palayamkottai, Tirunelveli 627002
4	Nature of Collaboration (Academic / Research / Faculty Exchange / Student Exchange / Project / Internship / On-the Job Training)	: Research
5	Nature / Details of Outcome (Guest Lecture / DC member / Co-guide / Project Reports / Other Reports/Publications)	: <b>DC member</b> [E. JIMI.A PUSHPAM, Reg. No. 19131272032005]
6	Period of Collaboration	: From: December, 2018 to till Date
7	Financial Involvement (if any)	: No
8	Proof Attached	: Yes
Signature of Principal		Signature of the Collaborating Faculty
		Signature of the Faculty

**PRINCIPAL**  
**SADAKATHULLAH APPA COLLEGE**  
**(AUTONOMOUS)**  
Rahmath Nagar, Tirunelveli - 627 011.

**Dr. J. WINFRED JEBARAJ**  
M.Sc., M.Phil., Ph.D.,  
Assistant Professor  
Research Department of Chemistry  
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Palayamkottai - 627 002.

**Dr. I. ANTONY DANISH, M.Sc., Ph.D.**  
Assistant Professor,  
Department of Chemistry  
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Rahmath Nagar, Tirunelveli - 627 011.

## 3.7.1/Collaborative Activities/2020-21/44



**MANONMANIAM SUNDARANAR UNIVERSITY**

Re-accredited with 'A' Grade by NAAC (3rd Cycle)

**CENTRE FOR RESEARCH**

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Phone : 0462 - 2311741, 0462 2311742, 0462 2311743, 0462 2311744, Fax : 0462 2311745, Email : [msu@msu.ac.in](mailto:msu@msu.ac.in)



**DR. K. SENTHAMARAI KANNAN**  
DIRECTOR

REF : MSU/RES/Admn/Jan 2019

Date : December 20, 2018

**Ph.D., Programme Commencement Order**

To  
JIMLA PUSHPAM E  
2-1C, KAMARAJAR STREET, EDUPPUR  
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Tamil Nadu, Thirunelveli, Pincode - 627354  
Mobile No. : 9467089891, Email ID : [jimla2@gmail.com](mailto:jimla2@gmail.com)

Sir/Madam,

Sub: Registration for doing Ph.D., programme - Date of Commencement of Research work - Intimation  
- Reg

Ref: Counseling attended by the candidate for January 2019 session.

With reference to the above, you are provisionally registered for Ph.D., Programme as detailed below :

Name of the Scholar	JIMLA PUSHPAM E
Registration No.	19131272032005
Discipline	Chemistry
Inter Disciplinary Detail	NO
Gender / Community	Female / BC
Nationality	INDIAN
PWD Status	Not Applicable
Admission Based On / Mode	M.Phil / PART TIME EXTERNAL
Research Centre	St. John's College, Palayamkottai
Name of the Supervisor	DR J WINFRED JEBARAJ, Department of Chemistry, ST. JOHN'S COLLEGE, PALAYAMKOTTAI Mobile No. : 9443969511, Email ID : <a href="mailto:drwins@gmail.com">drwins@gmail.com</a>
Name of the Co-Supervisor	NIL
Doctoral Committee Members	1. DR ABBS FERREGI, ASSISTANT PROFESSOR, DEPARTMENT OF CHEMISTRY, NMC COLLEGE, NAGERCOIL-65 Mobile No. : 942865090, Email ID : NIL  2. DR P ANTONY DANISH, ASSISTANT PROFESSOR, DEPARTMENT OF CHEMISTRY, SADAKATHULLAH APPA COLLEGE, TIRUNELVELI-11 Mobile No. : 9799163932, Email ID : <a href="mailto:antonydanish@gmail.com">antonydanish@gmail.com</a>
Proposed Title	THEORETICAL STUDIES OF SIMPLE DIAZEPAM BY DFT STUDIES
Date of Commencement	20.12.2018

ASSTANT

SUPERINTENDENT

ASSISTANT REGISTRAR

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**Sadakathullah Appa College  
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1	Name of the Faculty with Designation, Staff ID	: <b>Dr. I. ANTONY DANISH</b> Assistant Professor, Department of Chemistry ATCH05
2	Name of the Collaborating Faculty with Designation	: <b>Dr. J. WINFRED JEBARAJ</b> Assistant Professor, Department of Chemistry, St. John's College, Palayamkottai, Tirunelveli 627002
3	Name of the Collaborating Organization	: Department of Chemistry, St. John's College, Palayamkottai, Tirunelveli 627002
4	Nature of Collaboration (Academic / Research / Faculty Exchange / Student Exchange / Project / Internship / On-the Job Training)	: Research
5	Nature / Details of Outcome (Guest Lecture / DC member / Co-guide / Project Reports / Other Reports/Publications)	: <b>Publication</b>
6	Period of Collaboration	: From: 2020 To 2021
7	Financial Involvement (if any)	: No
8	Proof Attached	: Yes

Signature of Principal

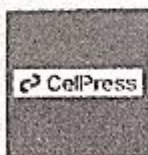
Signature of the Collaborating Faculty

Signature of the Faculty

**Dr. J. WINFRED JEBARAJ**  
M.Sc., M.Phil., Ph.D.,  
Assistant Professor  
Research Department of Chemistry  
St. John's College,  
Palayamkottai - 627 002.

**Dr. I. ANTONY DANISH, M.Sc., Ph.D.**  
Assistant Professor,  
Department of Chemistry  
Sadakathullah Appa College (Autonomous)  
Rahmath Nagar, Tirunelveli - 627 011

**PRINCIPAL  
SADAKATHULLAH APPA COLLEGE  
(AUTONOMOUS)  
Rahmath Nagar, Tirunelveli - 627 011.**



## Research article

## Spectral, NBO, NLO, NCI, aromaticity and charge transfer analyses of anthracene-9,10-dicarboxaldehyde by DFT

J. Jebasingh Kores<sup>a,1</sup>, I. Antony Danish<sup>b,1</sup>, T. Sasitha<sup>c,1</sup>, J. Gershom Stuart<sup>c,1</sup>,  
E. Jimla Pushpam<sup>c,1</sup>, J. Winfred Jebaraj<sup>c,\*,1</sup>

<sup>a</sup> Department of Physics, Pope's College (Autonomous), Saiveerapuram, 628251, Tamilnadu, India

<sup>b</sup> Department of Chemistry, Sadakathullah Appa College (Autonomous), Tirunelveli, 627011, Tamilnadu, India

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## ARTICLE INFO

**Keywords:**  
Anthracene-9,10-dicarboxaldehyde  
DFT  
Docking  
NBO  
Non-covalent interaction  
HOMA

## ABSTRACT

Anthracene-9,10-dicarboxaldehyde (ADCA) is a polynuclear aromatic compound that has a planar structure with double bonds which are in conjugation. The molecule is subjected to theoretical investigation with DFT/B3LYP/6-311++G(d,p) basis set to find out the electronic structural properties and stability. Theoretical and experimental vibrational analyses are carried out. NBO studies predict that the molecule has high stability. NCI interaction studies reveal that Van der Waals force and steric effect are seen in the molecule. A shaded surface map with a projection of LOL analysis pointed out that electron depletion area is seen in this molecule. The tunnelling current is more in the boundary rings than the central ring. It is docked with the protein 4COF and the binding energy is found to be -6.6 kcal/mol. Electronic excitation analysis is performed and found that local excitation takes place for the lowest five excitations. The aromaticity of the molecule is also thoroughly investigated.

## 1. Introduction

Poly-nuclear aromatic compounds like anthracene are having a  $\pi$  conjugated electron system which has a great impact in many research areas like material science [1, 2]. The organic  $\pi$  electron systems have attracted great interest from both the scientific communities and industrialists on the basis of the potential applications as active elements in LED (Light-emitting electrode). The distribution of electron clouds on the aromatic moiety determines the optical and electro-physical properties. Ionization potential and electron affinity are always related to this kind of charge carriers. The mobility of the charge from one place to another is a key factor for the development of new organic optoelectronic material or devices. Normally anthracene and its derivatives have applications in organic electroluminescence investigations [3, 4, 5] and molecule conductivity studies [6]. The rich  $\pi$  conjugated system has a rigid planar structure.

The arrival of computational practices assists to predict the properties of molecules and to explore the chemical dependences. Usually DFT approach can give more accurate results than semi empirical methods [7]. This molecule has three rings, i.e., two terminals and one centre ring

with electron withdrawing substitution at the two corners of it. So it is decided to check how the aromaticity is varied? Properties like electronic structure, NBO (Natural Bond Orbital), NLO (Non Linear Optical), ESP (Electrostatic Potential), Frontier energy gap, Mulliken charge prediction, and theoretical spectral analysis, etc., are useful to interpret about a molecule completely. But unfortunately there is no such work has been done on this molecule. Hence it is decided to explore the properties by DFT and wave function analysis for the structurally important molecule. DFT investigation of anthracene-9,10-dicarboxaldehyde is carried out to investigate all the above said properties clearly. Since the molecule is a planar poly-nuclear ring system, the stability is expected to be very much. So we tried to identify which parameters are helpful to enhance the stability of this molecule. A thorough NBO study is carried out to know about the stability of the molecule. Wave function analyses which furnish more clarity about the structural properties like, NCI (Non Covalent Interaction), Shaded surface map determination, Hole-electron excitation, aromaticity determination, etc., are carried out.

The molecule under investigation is checked with PASS online tool to have an idea about the choice of proteins to bind. Interestingly the results suggested that this molecule can be docked well with around 200

\* Corresponding author.

E-mail address: [winfred.chem@stjohnscollege.edu.in](mailto:winfred.chem@stjohnscollege.edu.in) (J. Winfred Jebaraj).

<sup>1</sup> Affiliated to Manonmaniam Sundaranar University, Abishekapatti, Tirunelveli- 627012, Tamilnadu, India.





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2	Name of the Collaborating Faculty with Designation	: <b>Dr. J. JEBASINGH KORES</b> Assistant Professor Department of Physics Pope's College (Autonomous), Sawyerpuram, Tamil Nadu 628 251, India
3	Name of the Collaborating Organization	: Department of Physics Pope's College (Autonomous), Sawyerpuram, Tamil Nadu 628257, India
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5	Nature / Details of Outcome (Guest Lecture / DC member / Co-guide / Project Reports / Other Reports/Publications)	: <b>Publication</b>
6	Period of Collaboration	: From: 2020 to 2021
7	Financial Involvement (if any)	: No
8	Proof Attached	: Yes

Signature of Principal

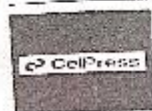
**PRINCIPAL**  
**SADAKATHULLAH APPA COLLEGE**  
**(AUTONOMOUS)**  
Rahmath Nagar, Tirunelveli - 627 011.

Signature of the Collaborating Faculty

**Dr. J. Jebasingh Kores, Ph.D.**  
**Assistant Professor in Physics**  
**Pope's College**  
**Sawyerpuram - 628 251.**

Signature of the Faculty

**Dr. I. ANTONY DANISH, M.Sc., Ph.D.**  
**Assistant Professor,**  
**Department of Chemistry**  
**Sadakathullah Appa College (Autonomous)**  
**Rahmath Nagar, Tirunelveli - 627 011**



## Research article

## Spectral, NBO, NLO, NCI, aromaticity and charge transfer analyses of anthracene-9,10-dicarboxaldehyde by DFT

J. Jebasingh Kores<sup>a,1</sup>, I. Antony Danish<sup>b,1</sup>, T. Sasitha<sup>c,1</sup>, J. Gershom Stuart<sup>c,1</sup>,  
E. Jimia Pushpam<sup>c,1</sup>, J. Winfred Jebaraj<sup>c,2,1</sup>

<sup>a</sup> Department of Physics, Pope's College (Autonomous), Sengapattur, 620251, Tamilnadu, India

<sup>b</sup> Department of Chemistry, Kadakshullah Appa College (Autonomous), Tiruchelvi, 627017, Tamilnadu, India

<sup>c</sup> Department of Chemistry, St. John's College, Tiruchelvi, 627002, Tamilnadu, India

## ARTICLE INFO

**Keywords:**  
Anthracene-9,10-dicarboxaldehyde  
DFT  
Docking  
NBO  
Non-covalent interaction  
HOMA

## ABSTRACT

Anthracene-9,10-dicarboxaldehyde (ADCA) is a polynuclear aromatic compound that has a planar structure with double bonds which are in conjugation. The molecule is subjected to theoretical investigation with HF/6-31G//6-31G+1/6-31G+1 basis set to find out the electronic structural properties and stability. Theoretical and experimental vibrational analyses are carried out. NBO studies predict that the molecule has high stability. NCI interaction studies reveal that Van der Waals force and steric effect are seen in the molecule. A shaded surface map with a projection of LOL analysis pointed out that electron depletion area is seen in this molecule. The conjugation current is more in the boundary rings than the central ring. It is dosed with the protein 4GDP and the binding energy is found to be -6.8 kcal/mol. Electronic excitation analysis is performed and found that local excitation takes place for the lowest two excitations. The aromaticity of the molecule is also thoroughly investigated.

## 1. Introduction

Poly nuclear aromatic compounds like anthracene are having a  $\pi$  conjugated electron system which has a great impact in many research areas like material science [1, 2]. The organic  $\pi$  electron systems have attracted great interest from both the scientific communities and industries on the basis of the potential applications as active elements in LED (light emitting diode). The distribution of electron clouds on the aromatic moiety determines the optical and electro-physical properties. Ionization potential and electron affinity are always related to this kind of charge carriers. The mobility of the charge from one place to another is a key factor for the development of new organic optoelectronic material or devices. Normally anthracene and its derivatives have applications in organic electroluminescence investigations [3, 4, 5] and molecule conductivity studies [6]. The rich  $\pi$  conjugated system has a rigid planar structure.

The arrival of computational practices assists to predict the properties of molecules and to explore the chemical dependence. Usually DFT approach can give more accurate results than semi empirical methods [7]. This molecule has three rings, i.e., two terminal and one centre ring

with electron withdrawing substitution at the two corners of it. So it is decided to check how the aromaticity is varied? Properties like electronic structure, NBO (Natural Bond Orbital), NLO (Non Linear Optical), ESP (Electrostatic Potential), Frontier energy gap, Mulliken charge prediction, and theoretical spectral analysis, etc., are useful to understand about a molecule completely. But unfortunately there is no such work has been done on this molecule. Hence it is decided to explore the properties by DFT and wave function analysis for the structurally important molecule. DFT investigation of anthracene-9,10-dicarboxaldehyde is carried out to investigate all the above said properties clearly. Since the molecule is a planar poly-nuclear ring system, the stability is expected to be very much. So we tried to identify which parameters are helpful to enhance the stability of this molecule. A thorough NBO study is carried out to know about the stability of the molecule. Wave function analyses which furnish more clarity about the structural properties like, NCI (Non Covalent Interaction), Shaded surface map determination, Hole-electron excitation, aromaticity determination, etc., are carried out.

The molecule under investigation is checked with PASS online tool to have an idea about the choice of proteins to bind. Interestingly the results suggested that this molecule can be docked well with around 200

<sup>1</sup> Corresponding author.

E-mail address: winfred.chem@stjohnscollege.edu.in (J. Winfred Jebaraj).

<sup>2</sup> Affiliated to Munnarmaniam Sundaranar University, Abishekapatti, Tiruchelvi, 627012, Tamilnadu, India.

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**Sadakathullah Appa College**  
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1	Name of the Faculty with Designation, Staff ID	: <b>Dr. I. ANTONY DANISH</b> Assistant Professor, Department of Chemistry ATCH05
2	Name of the Collaborating Faculty with Designation	: <b>Dr. J. WINFRED JEBARAJ</b> Assistant Professor, Department of Chemistry, St. John's College, Palayamkottai, Tirunelveli 627002
3	Name of the Collaborating Organization	: Department of Chemistry, St. John's College, Palayamkottai, Tirunelveli 627002
4	Nature of Collaboration (Academic / Research / Faculty Exchange / Student Exchange / Project / Internship / On-the Job Training)	: Research
5	Nature / Details of Outcome (Guest Lecture / DC member / Co-guide / Project Reports / Other Reports/Publications)	: DC member [S. SANTHA PON ROJA, Reg. No. 19111192032013]
6	Period of Collaboration	: From: December, 2018 to Till Date
7	Financial Involvement (if any)	: No
8	Proof Attached	: Yes

Signature of Principal

Signature of the Collaborating Faculty

**Dr. J. WINFRED JEBARAJ**  
M.Sc., M.Phil., Ph.D.

Assistant Professor  
Research Department of Chemistry  
St. John's College,  
Palayamkottai - 627 002.

Signature of the Faculty

**Dr. I. ANTONY DANISH; M.Sc., Ph.D.**  
Assistant Professor,  
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Sadakathullah Appa College (Autonomous)  
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**PRINCIPAL**  
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Rahmath Nagar, Tirunelveli - 627 911,


**MANONMANIAM SUNDARANAR UNIVERSITY**

Reaccredited with 'A' Grade by NAAC (3rd Cycle)

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 DR. K. SENTHAMARAI KANNAN  
 DIRECTOR

REF: MSU/RES/Admn/Jan 2019

Date: December 22, 2018

**Ph.D., Programme Commencement Order**

To

 SANTHA PON ROJA S  
 4-142 main road, karisalpatti, cheranmahadevi  
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 Mobile No : 6369005188, Email ID : santhaponroja95@gmail.com

Sir/Madam,

 Sub: Registration for doing Ph.D., programme - Date of Commencement of Research work - Intimation - Reg  
 Ref: Counseling attended by the candidate for January 2019 session.

\*\*\*\*\*

With reference to the above, you are provisionally registered for Ph.D., Programme as detailed below:

Name of the Scholar	SANTHA PON ROJA S
Registration No.	19111192032013
Discipline	Chemistry
Inter Disciplinary Detail	Nil
Gender / Community	Female / BC
Nationality	Indian
PWD Status	Not Applicable
Admission Based On / Mode	M.Phil / FULL TIME
Research Centre	Sadakathullah Appa College, Tirunelveli.
Name of the Supervisor	DR I ANTONY DANISH, Department of Chemistry, Sadakathullah Appa College, Palayamkottai, Tirunelveli Mobile No. : 9790163932, Email ID : antonydanish@gmail.com
Name of the Co-Supervisor	NIL
Doctoral Committee Members	1. DR S STELLA, ASSISTANT PROFESSOR, CHEMISTRY, SARAH TUCKER COLLEGE, TIRUNELVELI. Mobile No. : 7698879390, Email ID : stella.selvarej@gmail.com  2. DR J WINFRED JEBARAJ, ASSISTANT PROFESSOR, CHEMISTRY, ST. JOHN'S COLLEGE, TIRUNELVELI. Mobile No. : 9443969511, Email ID : drwinswins@gmail.com
Proposed Title	SYNTHESIS, CHARACTERISATION AND DFT ON O-AND N- SUBSTITUTED NEW HETEROCYCLIC COMPOUNDS
Date of Commencement	22.12.2018

ASSISTANT

SUPERINTENDENT

ASSISTANT REGISTRAR

DIRECTOR

Copy To : Supervisor, Co-Supervisor (If applicable) / Research Centre / Doctoral Committee Members





**Sadakathullah Appa College**  
(Autonomous)  
Rahmath Nagar, Tirunelveli - 627011

1	Name of the Faculty with Designation, Staff ID	: <b>Dr. I. ANTONY DANISH</b> Assistant Professor, Department of Chemistry ATCH05
2	Name of the Collaborating Faculty with Designation	: <b>Dr. P. RAJESH ANANTHASELVAN</b> Assistant Professor, Department of Chemistry, St. John's College, Palayamkottai, Tirunelveli 627002
3	Name of the Collaborating Organization	: Department of Chemistry, St. John's College, Palayamkottai, Tirunelveli 627002
4	Nature of Collaboration (Academic / Research / Faculty Exchange / Student Exchange / Project / Internship / On-the Job Training)	: Research
5	Nature / Details of Outcome (Guest Lecture / DC member / Co-guide / Project Reports / Other Reports/Publications)	: <b>DC Member</b> [ <b>M PRAVEENDANIEL</b> , Registration No. 20111272031005]
6	Period of Collaboration	: From: 2019 To 2020
7	Financial Involvement (if any)	: No
8	Proof Attached	: Yes

Signature of Principal

Signature of the Collaborating Faculty

Signature of the Faculty

PRINCIPAL

**SADAKATHULLAH APPA COLLEGE**  
(AUTONOMOUS)  
Rahmath Nagar, Tirunelveli - 627 011.

**Dr. P. Rajesh Anantha Selvan**  
M.Sc., M.E.,  
Asst. Professor

Department of Chemistry  
St. John's College  
Palayamkottai - 627 002.

**Dr. I. ANTONY DANISH, M.Sc., Ph.D.**  
Assistant Professor,  
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Rahmath Nagar, Tirunelveli - 627 011


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**CENTRE FOR RESEARCH**

ABISHEKAPATTI, TIRUNELVELI - 627 012, TAMILNADU, INDIA

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**DR. K. SENTHAMARAI KANNAN**  
**DIRECTOR**

REF : MSU/RES/Admn/January 2020

Date : March 11, 2020

**Ph.D., Programme Commencement Order**

To

 M PRAVEENDANIEL  
 NO 11B KIRUBAIYAR STREET, SAMANTHAPURAM, MILITARYLINE, PALAYAMKOTTAI TIRUNELVELI  
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Sir/Madam,

Sub: Registration for doing Ph.D., programme - Date of Commencement of Research work - Intimation - Reg

Ref: Counseling attended by the candidate for January 2020 session.

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Name of the Scholar	M PRAVEENDANIEL
Registration No.	20111272031005
Discipline	Chemistry
Gender / Community	Male / BC
Nationality	INDIAN
PWD Status	Not Applicable
Admission Based On / Mode	PG / FULL TIME
Research Centre	St. John's College, Palayamkottai
Name of the Supervisor with Address	Dr. P. Rajesh Anantha, Assistant Professor Department of Chemistry, St. John's College, Palayamkottai, 627002 Mobile No. : 9443418802, Email ID : rajesh.chem@stjohnscollege.edu.in
Name of the Co-Supervisor with Address	NIL
Doctoral Committee Members	1. DR M DANIEL SWEETLIN, ASSOCIATE PROFESSOR AND HEAD, DEPARTMENT OF PHYSICS, ST. JOHN'S COLLEGE, PALAYAMKOTTAI- 627002. Mobile No. : 9442329049, Email ID : danielsweetlin@gmail.com  2. DR I ANTONY DANISH, ASSOCIATE PROFESSOR, DEPARTMENT OF CHEMISTRY, SADAKATHULLA APPA COLLEGE, PALAYAMKOTTAI- 627011 Mobile No. : 9790163932, Email ID : antonydanish@gmail.com
Proposed Title	Synthesis, characterization and application study of nanocatalyst for sustainable environment
Date of Commencement	11.03.2020

  
 ASSISTANT


  
 SUPERINTENDENT


  
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 DIRECTOR

Copy To : Supervisor, Co-Supervisor (if applicable) / Research Centre / Doctoral Committee Members





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2	Name of the Collaborating Faculty with Designation	:	<b>Dr. P. RAJESH ANANTHASELVAN</b> Assistant Professor, Department of Chemistry, St. John's College, Palayamkottai, Tirunelveli 627002
3	Name of the Collaborating Organization	:	Department of Chemistry, St. John's College, Palayamkottai, Tirunelveli 627002
4	Nature of Collaboration (Academic / Research / Faculty Exchange / Student Exchange / Project / Internship / On-the Job Training)	:	Research
5	Nature / Details of Outcome (Guest Lecture / DC member / Co-guide / Project Reports / Other Reports/Publications)	:	DC Member [VENKATESAN R, Registration No.: 20221272271010]
6	Period of Collaboration	:	From: 2020 To 2021
7	Financial Involvement (if any)	:	No
8	Proof Attached	:	Yes
Signature of Principal		Signature of the Collaborating Faculty	Signature of the Faculty
		 <b>Dr. P. Rajesh Anantha Selvan</b> M.Sc., M.E.,	 <b>Dr. I. ANTONY DANISH, M.Sc., M.D.</b> Assistant Professor, Department of Chemistry Sadakathullah Appa College (Autonomous) Rahmath Nagar, Tirunelveli - 627 011

**PRINCIPAL**  
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**Asst. Professor**  
**Department of Chemistry**  
**St. John's College**  
**Palayamkottai - 627 002.**


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**DR. C. KANNAN**  
**DIRECTOR**

REF : MSU/RES/Admn/July 2020 Session

Date : December 30, 2020

**Ph.D., Programme Commencement Order**

To

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Sub: Registration for doing Ph.D., programme - Date of Commencement of Research work - Intimation - reg.

Ref: Counselling attended by the candidate for July 2020 session.

\*\*\*\*\*

With reference to the above, you are provisionally registered for Ph.D., Programme as detailed below :

Name of the Scholar	VENKATESAN R
Registration No.	20221272271010
Discipline	Inter Disciplinary
Inter Disciplinary Detail	Chemical Science - Chemistry
Gender & Community	Male & SC
Nationality	INDIAN
PWD Status	Not Applicable
Admission Based On & Mode	PG & PART TIME
Research Centre	St. John's College, Tirunelveli
Name of the Supervisor with Address	Dr. P. Rajesh Anantha, Assistant Professor Department of Chemistry, St. John's College, Palayamkottai, 627002 Mobile No. : 9443418802, Email ID : rajesh.chem@stjohnscollege.edu.in
Name of the Co-Supervisor with Address	NIL
Doctoral Committee Members	1. DR P MUTHU SELVAN, Associate Professor and Head, Department of Chemistry, St. John's College, Palayamkottai 627002 Mobile No. : 6381646323, Email ID : jackmuthu56@gmail.com 2. DR   ANTONY DANISH, Associate Professor, Department of Chemistry, Sadakathulish Appa College, Tirunelveli 627011 Mobile No. : 9790163932, Email ID : antonydanish@gmail.com
Proposed Title	studies on electrochemical sensors or fuel cells
Date of Commencement	30.12.2020

ASSISTANT

SUPERINTENDENT

ASSISTANT REGISTRAR



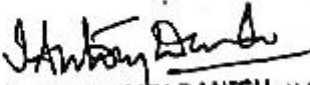
DIRECTOR

Copy To : Supervisor, Co-Supervisor (if applicable) / Research Centre / Doctoral Committee Members





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1	Name of the Faculty with Designation, Staff ID	:	<b>Dr. I. ANTONY DANISH</b> Assistant Professor, Department of Chemistry ATCH05
2	Name of the Collaborating Faculty with Designation	:	<b>Dr. J SHAKINA</b> Associate Professor Department of Chemistry and Research Centre, Sarah Tucker College [Autonomous], Tirunelveli
3	Name of the Collaborating Organization	:	Department of Chemistry and Research Centre, Sarah Tucker College [Autonomous], Tirunelveli
4	Nature of Collaboration (Academic / Research / Faculty Exchange / Student Exchange / Project / Internship / On-the Job Training)	:	Research
5	Nature / Details of Outcome (Guest Lecture / DC member / Co-guide / Project Reports / Other Reports/Publications)	:	Co-Guide
6	Period of Collaboration	:	From: 2019 To till date
7	Financial Involvement (if any)	:	No
8	Proof Attached	:	Yes
Signature of Principal		Signature of the Collaborating Faculty	
		 <b>Dr. J. SHAKINA</b> , M.Sc., M.Phil., Ph.D., Assistant Professor Dept. of Chemistry & Research Centre, Sarah Tucker College (Autonomous), Tirunelveli - 627 017	
		Signature of the Faculty	
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Dr. K. Senthamaral Kannan  
Director - Centre for Research

Date: 25/01/2019

Change of Guide Order

Change of Guide from Dr. P. Sengu, Associate Professor of Chemistry, Sri K.G.S. Arts College, Srivaikuntam - 628 619 to Dr. I. Antony Danish, Assistant Professor of Chemistry, Sadakathullah Appa College (Autonomous), Tirunelveli - 627 011 has been granted to Mrs. T. Sahaya Maria Jeyaseeli. Reg. No.12579.

*[Signature]*  
DIRECTOR

Copy to:


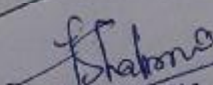
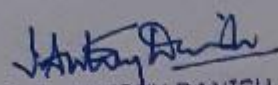
- ✓ 1. Dr. I. Antony Danish - Guide  
Assistant Professor of Chemistry  
Sadakathullah Appa College (Autonomous)  
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2. Dr. J. Shakina - Co-Guide  
Assistant Professor of Chemistry  
Sarah Tucker College (Autonomous)  
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3. Mrs. T. Sahaya Maria Jeyaseeli - Candidate  
W/o. Mr. J. Savari Rajan  
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4. Dr. P. Sengu - For Information  
Associate Professor of Chemistry  
Sri. KGS Arts College, Srivaikuntam - 628 619.

*[Signature]*  
25/1/19

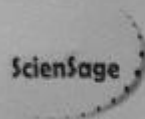




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1	Name of the Faculty with Designation, Staff ID	: <b>Dr. I. ANTONY DANISH</b> Assistant Professor, Department of Chemistry ATCH05
2	Name of the Collaborating Faculty with Designation	: <b>Dr. J. SHAKINA</b> Associate Professor Department of Chemistry and Research Centre, Sarah Tucker College [Autonomous], Tirunelveli
3	Name of the Collaborating Organization	: Department of Chemistry and Research Centre, Sarah Tucker College [Autonomous], Tirunelveli
4	Nature of Collaboration (Academic / Research / Faculty Exchange / Student Exchange / Project / Internship / On-the Job Training)	: Research
5	Nature / Details of Outcome (Guest Lecture / DC member / Co-guide / Project Reports / Other Reports/Publications)	: Publications
6	Period of Collaboration	: From: 2020 To 2021
7	Financial Involvement (if any)	: No
8	Proof Attached	: Yes
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		 <b>Dr. J. SHAKINA, M.Sc., M.Phil Ph.D.,</b> Assistant Professor Dept. of Chemistry & Research Centre Sarah Tucker College (Autonomous) Tirunelveli - 627 007
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		 <b>Dr. I. ANTONY DANISH, M.Sc., Ph.D.</b> Assistant Professor, Department of Chemistry Sadakathullah Appa College (Autonomous) Rahmath Nagar, Tirunelveli - 627 011.

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## RECENT ADVANCES IN MECHANICAL BEHAVIOR OF FIBRE REINFORCED SMART BIODEGRADABLE POLYMERS

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### ABSTRACT

Fibre-reinforced polymer composites have been developed from the reaction of fumarate resin with natural material Perch fibre. The composite material is fabricated by hand layup technique. The fabricated composite material was tested for its mechanical properties such as Tensile Strength, Flexural Strength and Impact Strength. The composite specimens for the above-mentioned test were prepared as per the ASTM standards. The fibre reinforcement influenced the improvement of mechanical properties of polymers and surface morphology of the polymer was analysed by Scanning Electron Microscope. Moisture absorption and vibration damping with polymers and its effect on mechanical properties can also be studied. Tensile strength, flexural strength and impact strength were observed and compared to each other. Tensile test showed maximum ultimate tensile strength for untreated 80 mm length fibre compared to others. Flexural test showed maximum ultimate flexural strength for untreated 80 mm length fibre compared to others. Impact test showed higher impact energy for treated 40 mm length fibre compared to others.

**Keywords:** Biodegradable, Eco-friendly, Thermoset, Mechanical, Moisture, Vibration.

### 1. INTRODUCTION

Natural fibres are recently attracted towards researchers due to their low cost, eco-friendly, low density, good mechanical properties and as a renewable source [1]. Natural fibres offer many technological and environmental benefits to reinforce low density materials with high strength and is favourable as a reinforcement in making lightweight polymers with good mechanical properties [2]. A special benefit of using fibre reinforced polymer is its biodegradability and extremely available from a renewable resource. As fibre contents increases, the mechanical properties such as tensile, impact and flexural strengths of these properties also increases [3]. Different kinds of tests have been performed on the polymer composites and the reports reveal that they have interesting mechanical properties [4]. Due to various chemical treatments on fibres, the hydrophilic behaviour of the fibres was reduced to improve mechanical strength in natural fibre reinforced polymers [5]. Fibre reinforced polymers assist to expand strength and ductility without increase in stiffness [6].

### 2. EXPERIMENTAL

#### 2.1. Materials

Azadirachta Indica oil (AIO) and Thennamarakudi oil (TKO) were purchased from local market, Formic acid (97%) (Rankem), Hydrogen peroxide (30%) (Rankem) were used in the first step fractionalization. Maleic anhydride (Rankem) morpholine (Rankem) and benzoyl peroxide (Rankem) was used as a radical initiator and N, N- dimethyl aniline (Rankem) was used as accelerator in the curing process. Styrene (Rankem) was used as a vinyl co-monomer.


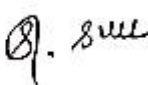
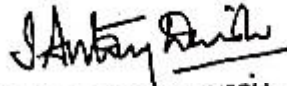
#### 2.2. Synthesis of plant oil polyol

A 100 g of AIO/TKO was taken in a three necked flask fitted with condenser and thermometer. 100 mL of 97% formic acid and 55 mL of 30% hydrogen peroxide was added. Ice water bath was used externally to keep the temperature below 4°C. The reaction mixture was vigorously stirred over 16hr. The resulting emulsion was poured into a separating funnel and extracted with ether. The ether layer was dried over anhydrous sodium sulphate and the resulting product was polyol resin obtained from AIO/TKO.





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2	Name of the Collaborating Faculty with Designation	:	<b>Dr. S. STELLA</b> Assistant Professor, Department of Chemistry, Sarah Tucker College [Autonomous], Tirunelveli
3	Name of the Collaborating Organization	:	PG Department of Chemistry and Research Centre, Sarah Tucker College [Autonomous], Tirunelveli
4	Nature of Collaboration (Academic / Research / Faculty Exchange / Student Exchange / Project / Internship / On-the Job Training)	:	Research
5	Nature / Details of Outcome (Guest Lecture / DC member / Co-guide / Project Reports / Other Reports/Publications)	:	<b>DC Member</b> [RAJA RAJESWARI A., Register No.: 18221202032006]
6	Period of Collaboration	:	From: 5 <sup>th</sup> July, 2018 to till date
7	Financial Involvement (if any)	:	No
8	Proof Attached	:	Yes
Signature of Principal		Signature of the Collaborating Faculty	
		 <b>Dr S. STELLA</b> Asst. Professor Dept. of Chemistry, Sarah Tucker College Tirunelveli - 627 007	
		Signature of the Faculty	
		 <b>Dr. I. ANTONY DANISH, M.Sc., M.B.</b> Assistant Professor, Department of Chemistry Sadakathullah Appa College (Autonomous) Rahmath Nagar, Tirunelveli - 627 011.	

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ENTHAMARAI KANNAN  
DIRECTOR

MSU/RES/R1/JULY 2018

Date : 05-July-2018

**Ph.D., Programme Commencement Order**

To

RAJA RAJESWARI A  
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Mobile No : 9894811405 , Email Id : rajarajeswaritdms@gmail.com

Sir/Madam,

Sub: Registration for doing Ph.D., programme - Date of Commencement of Research work - Intimation-Reg

Ref: Counseling attended by the candidate.

With reference to the above, you are provisionally registered for Ph.D., Programme as detailed below :

- |  |   |
|--|---|
| 1. Name of the Scholar                 | : RAJA RAJESWARI A  |
| 2. Registration No                     | : 18221202032006  |
| 3. Discipline                          | : Chemistry   |
| 4. Gender                              | : Female  |
| 5. Social Category (Community)         | : DNC   |
| 6. Nationality                         | : INDIAN  |
| 7. PWD Status                          | : Not Applicable  |
| 8. Admission Based On                  | : M.Phil  |
| 9. Name of the Supervisor              | : DR S STELLA   |
| 10. Name of the Co-Supervisor          | : NIL   |
| 11. Mode                               | : PART TIME INTERNAL  |
| 12. Research Centre                    | : SARAH TUCKER COLLEGE, PALAYAMKOTTAI   |
| 13. Date of Commencement               | : 05.07.2018  |
| 14. Proposed Title                     | : STUDIES ON SYNTHESIS, CHARACTERIZATION AND APPLICATIONS OF METAL NANOPARTICLES IN IONIC LIQUIDS |
| 15. Doctoral Committee Members Details | : 1. DR V RAMA<br>ASSO PROF OF CHEMISTRY STC COLLEGE TIRUNELVELI                                  |
|  | : 2. DR I ANTONY DANISH<br>ASST PROF OF CHEMISTRY SA COLLEGE PALAYAMKOTTAI                        |

ASSISTANT

SUPERINTENDENT



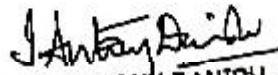
ASSISTANT REGISTRAR

DIRECTOR





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1	Name of the Faculty with Designation, Staff ID	: <b>Dr. I. ANTONY DANISH</b> Assistant Professor, Department of Chemistry ATCH05
2	Name of the Collaborating Faculty with Designation	: <b>Dr. S. STELLA</b> Assistant Professor, Department of Chemistry, Sarah Tucker College [Autonomous], Tirunelveli
3	Name of the Collaborating Organization	: PG Department of Chemistry and Research Centre, Sarah Tucker College [Autonomous], Tirunelveli
4	Nature of Collaboration (Academic / Research / Faculty Exchange / Student Exchange / Project / Internship / On-the Job Training)	: Research
5	Nature / Details of Outcome (Guest Lecture / DC member / Co-guide / Project Reports / Other Reports/Publications)	: <b>DC Member</b> <b>[S. SANTHA PON ROJA, Reg. No. 19111192032013]</b>
6	Period of Collaboration	: From: December, 2018 to till date
7	Financial Involvement (if any)	: No
8	Proof Attached	: Yes
Signature of Principal		Signature of the Collaborating Faculty
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		Signature of the Faculty
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**DR. K. SENTHAMARAI KANNAN**  
 DIRECTOR

REF - MSU/RES/Admn/Jan 2019

Date : December 22, 2018

Ph.D., Programme Commencement Order

To

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 4-142 main road, karisalpatti, cheranmahadevi  
 Tamil Nadu, Tirunelveli, Pincode - 627414  
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Sir/Madam,

 Sub: Registration for doing Ph.D., programme - Date of Commencement of Research work - Intimation - Reg  
 Ref: Counselling attended by the candidate for January 2019 session.

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Name of the Scholar	SANTHA PON ROJA S
Registration No	19111192032013
Discipline	Chemistry
Inter Disciplinary Detail	Nil
Gender / Community	Female / BC
Nationality	Indian
PWD Status	Not Applicable
Admission Based On / Mode	M.Phil / FULL TIME
Research Centre	Sadakathullah Appa College, Tirunelveli.
Name of the Supervisor	DR I ANTONY DANISH, Department of Chemistry, Sadakathullah Appa College, Palayamkottai, Tirunelveli. Mobile No. : 9790163932, Email ID : antonydanish@gmail.com
Name of the Co-Supervisor	NIL
Doctoral Committee Members	1. DR S STELLA, ASSISTANT PROFESSOR, CHEMISTRY, SARAH TUCKER COLLEGE, TIRUNELVELI. Mobile No. : 7598879390, Email ID : stella.selvaraj@gmail.com  2. DR J WINFRED JEBARAJ, ASSISTANT PROFESSOR, CHEMISTRY, ST. JOHN'S COLLEGE, TIRUNELVELI. Mobile No. : 9443969511, Email ID : drwinwins@gmail.com
Proposed Title	SYNTHESIS, CHARACTERISATION AND DFT ON O-AND N-SUBSTITUTED NEW HETEROCYCLIC COMPOUNDS
Date of Commencement	22.12.2018

ASSISTANT

SUPERINTENDENT

ASSISTANT REGISTRAR

DIRECTOR

Copy To : Supervisor, Co-Supervisor (if applicable) / Research Centre / Doctoral Committee Members


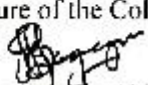
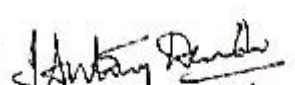




## Sadakathullah Appa College (Autonomous)

Rahmath Nagar, Tirunelveli - 627011

1	Name of the Faculty with Designation, Staff ID	: <b>Dr. I. ANTONY DANISH</b> Assistant Professor. Department of Chemistry ATCH05
2	Name of the Collaborating Faculty with Designation	: <b>Dr. B. RAVINDRAN DURAI NAYAGAM</b> Associate Professor and Head. Department of Chemistry Pope's College (Autonomous). Sawyerpuram, Tamil Nadu 628 251, India
3	Name of the Collaborating Organization	: Department of Chemistry Pope's College (Autonomous). Sawyerpuram, Tamil Nadu 628 251, India
4	Nature of Collaboration (Academic / Research / Faculty Exchange / Student Exchange / Project / Internship / On-the Job Training)	: Research
5	Nature / Details of Outcome (Guest Lecture / DC member / Co-guide / Project Reports / Other Reports/Publications)	: DC member
6	Period of Collaboration	: From: December, 2018 to Till Date
7	Financial Involvement (if any)	: No
8	Proof Attached	: Yes

Signature of Principal 	Signature of the Collaborating Faculty  Dr. B. Ravindran Durai Nayagam Associate Professor Department of Chemistry, Research Centre Pope's College (Autonomous) Sawyerpuram - 628 251	Signature of the Faculty  Dr. I. ANTONY DANISH, M.Sc., Ph.D. Assistant Professor, Department of Chemistry Sadakathullah Appa College (Autonomous) Rahmath Nagar, Tirunelveli - 627 011
---	--	--

**PRINCIPAL**  
**SADAKATHULLAH APPA COLLEGE**  
**(AUTONOMOUS)**  
 Rahmath Nagar, Tirunelveli - 627 011.

## 3.7.1/Collaborative Activities/2020-21/55



**MANONMANIAM SUNDARANAR UNIVERSITY**

Reaccredited with 'A' Grade by NAAC (3rd Cycle)

**CENTRE FOR RESEARCH**

ABISHEKAPATTI, TIRUNELVELI - 627 012, TAMILNADU, INDIA

Phone : 0462 - 2333741, 9487907003, Intercom : 243071, Mail: crmsu@msuniv.ac.in, web: msuniv.ac.in



**DR. K. SENTHAMARAI KANNAN**  
DIRECTOR

Date : December 20, 2018

REF : MSU/RES/Admn/Jan 2019

**Ph.D., Programme Commencement Order**

To

PETCHIAMMAL G  
46, North Street,, Megalingapuram  
Tirunelveli  
Tamil Nadu, Tirunelveli, Pincode - 627001  
Mobile No. : 9940752084, Email ID : petchiammal1980@gmail.com

Sir/Madam,

Sub: Registration for doing Ph.D., programme - Date of Commencement of Research work -  
Intimation - Reg

Ref: Counselling attended by the candidate for January 2019 session.

With reference to the above, you are provisionally registered for Ph.D., Programme as detailed below :

Name of the Scholar	PETCHIAMMAL G
Registration No.	19111192032005
Discipline	Chemistry
Gender / Community	Female / BC
Nationality	INDIAN
PWD Status	Not Applicable
Admission Based On / Mode	M.Phil / FULL TIME
Research Centre	Sadakathullah Appa College, Tirunelveli.
Name of the Supervisor	Dr. P. Sengu, Asso. Professor, , Department of Chemistry, Sri K.G.S Arts College, Srivaikundam Mobile No. : 9443670578, Email ID : paramasivansengu@gmail.com
Name of the Co-Supervisor	-Dr. I. Antony Danish, Asst. Professor, , Department of Chemistry, Sadakathullah Appa College (Autonomous), Palayamkottai, Tirunelveli Mobile No. : 9790163932, Email ID : antonydanish@gmail.com
Doctoral Committee Members	1. DR B RAVINDRAN DURAI NAYAGAM, Associate Professor, Department of Chemistry, Popas College, Sawyer Puram Mobile No. : 9443290387, Email ID : bravidural2@gmail.com 2. DR M SHEIK MUHIDEEN BADHUSHA, Assistant Professor, Department of Chemistry, Sadakathula Appa College, Tirunelveli Mobile No. : 9788749729, Email ID : drbadhushano@gmail.com
Proposed Title	STUDY OF MECHANISM OF Cr (VI) OXIDATION OF ORGANIC SUBSTRATES
Date of Commencement	20.12.2018

ASSISTANT SUPERINTENDENT ASSISTANT REGISTRAR

DIRECTOR

Copy To : Supervisor, Co-Supervisor (if applicable) / Research Centre / Doctoral Committee Members





**Sadakathullah Appa College**  
**(Autonomous)**  
Rahmath Nagar, Tirunelveli - 627011

1	Name of the Faculty with Designation, Staff ID	: <b>Dr. I. ANTONY DANISH</b> Assistant Professor. Department of Chemistry ATCH05
2	Name of the Collaborating Faculty with Designation	: <b>Dr. B. RAVINDRAN DURAI NAYAGAM</b> Associate Professor and Head. Department of Chemistry Pope's College (Autonomous), Sawyerpuram, Tamil Nadu 628 251, India
3	Name of the Collaborating Organization	: Department of Chemistry Pope's College (Autonomous), Sawyerpuram, Tamil Nadu 628 251, India
4	Nature of Collaboration (Academic / Research / Faculty Exchange / Student Exchange / Project / Internship / On-the Job Training)	: Research
5	Nature / Details of Outcome (Guest Lecture / DC member / Co-guide / Project Reports / Other Reports/Publications)	: DC member
6	Period of Collaboration	: From: December, 2018 to Till Date
7	Financial Involvement (if any)	: No
8	Proof Attached	: Yes

Signature of Principal

PRINCIPAL

**SADAKATHULLAH APPA COLLEGE**  
**(AUTONOMOUS)**  
Rahmath Nagar, Tirunelveli - 627 011.

Signature of the Collaborating Faculty

**Dr. B. RAVINDRAN DURAI NAYAGAM, M.Sc., Ph.D.,**  
Head & Associate Professor  
Department of Chemistry & Research Centre  
Pope's College (Autonomous)  
Sawyerpuram - 628 251

Signature of the Faculty

**Dr. I. ANTONY DANISH, M.Sc., Ph.D.**  
Assistant Professor,  
Department of Chemistry  
Sadakathullah Appa College (Autonomous)  
Rahmath Nagar, Tirunelveli - 627 011

22/12/2018


**MANONMANIAM SUNDARANAR UNIVERSITY**

Recognized with 'A' Grade by NAAC (1st Cycle)

**CENTRE FOR RESEARCH**

ABISHEKAPATTI, TIRUNELVELI - 627 012, TAMILNADU, INDIA

Phone : 0462 - 2333741, 9487402000, Fax: 0462 - 2563071, Mail : cfrmsu@msuniv.ac.in, web : msuniv.ac.in


**DR. K. SENTHAMARAI KANNAN**  
**DIRECTOR**

Date : December 22, 2018

REF : MSU/RES/Admn/Jan 2019

**Ph.D., Programme Commencement Order**

To

 A BANUMATHY  
 19 A 32, YADAVA WEST STREET  
 PALAYAMKOTTAI  
 Tamil Nadu, Thirunelveli, Pincode - 627002  
 Mobile No. : 8344026464. Email ID : pksbanu@gmail.com

Sir/Madam,

 Sub: Registration for doing Ph.D., programme - Date of Commencement of Research work -  
 Intimation - Reg

Ref: Counseling attended by the candidate for January 2019 session.

With reference to the above, you are provisionally registered for Ph.D., Programme as detailed below :

Name of the Scholar	A BANUMATHY
Registration No.	19121192032014
Discipline	Chemistry
Gender / Community	Female / BC
Nationality	INDIAN
PWD Status	Not Applicable
Admission Based On / Mode	PG / PART TIME INTERNAL
Research Centre	Sadakahullah Appa College, Tirunelveli.
Name of the Supervisor	Dr p sengu, Department of Chemistry, Sri K.G.S Arts College, Srivaikuntam Mobile No. : 9443670578, Email ID : paramasivansengu@gmail.com
Name of the Co-Supervisor	NIL
Doctoral Committee Members	<ol style="list-style-type: none"> <li>1. DR B RAVINDRAN DURAINAYAGAM, Associate professor, department of chemistry, popes college, sawyerpuram Mobile No. : 9443290387, Email ID : bravidura@gmail.com</li> <li>2. DR M SHEIK MUHIDEEN BADHUSHA, assistant professor, department of chemistry, sadakahullah appa college physical chemistry Mobile No. : 9788749729, Email ID : drbadhushano@gmail.com</li> </ol>
Proposed Title	KINETICS AND MECHANISM OF OXIDATION OF SOME ORGANIC SUBSTRATES WITH Cr VI OXIDISING AGENT
Date of Commencement	22.12.2018

ASSISTANT SUPERINTENDENT ASSISTANT REGISTRAR

DIRECTOR

Copy To : Supervisor, Co-Supervisor (if applicable) / Research Centre / Doctoral Committee Members





**Sadakathullah Appa College**  
**(Autonomous)**  
Rahmath Nagar, Tirunelveli - 627011

1	Name of the Faculty with Designation, Staff ID	:	<b>Dr. I. ANTONY DANISH</b> Assistant Professor, Department of Chemistry ATCH05
2	Name of the Collaborating Faculty with Designation	:	<b>Dr. P. SENGU</b> Associate Professor Department of Chemistry Sri K. G. S. Arts College, Srivaikuntam -628 619 Tamil Nadu
3	Name of the Collaborating Organization	:	Department of Chemistry Sri K. G. S. Arts College, Srivaikuntam -628 619 Tamil Nadu.
4	Nature of Collaboration (Academic / Research / Faculty Exchange / Student Exchange / Project / Internship / On-the Job Training)	:	Research
5	Nature / Details of Outcome (Guest Lecture / DC member / Co-guide / Project Reports / Other Reports/Publications)	:	Co-Guide
6	Period of Collaboration	:	From: December, 2018 to Till Date
7	Financial Involvement (if any)	:	No
8	Proof Attached	:	Yes
Signature of Principal		Signature of the Collaborating Faculty	Signature of the Faculty
		 P. Sengu Department of Chemistry Sri K. G. S. Arts College Srivaikuntam, Tamil Nadu.	 Dr. I. ANTONY DANISH, M.Sc., M.Phil. Assistant Professor, Department of Chemistry Sadakathullah Appa College (Autonomous) Rahmath Nagar, Tirunelveli - 627 011

**PRINCIPAL**  
**SADAKATHULLAH APPA COLLEGE**  
**(Autonomous)**  
Rahmath Nagar, Tirunelveli - 627 011.

**Dr. I. ANTONY DANISH, M.Sc., M.Phil.**  
Assistant Professor,  
Department of Chemistry  
Sadakathullah Appa College (Autonomous)  
Rahmath Nagar, Tirunelveli - 627 011

2016

MSU PhD Admission 19121192032014

### 3.7.1/Collaborative Activities/2020-21/57



## MANONMANIAM SUNDARANAR UNIVERSITY

Reaccredited with 'A' Grade by NAAC (3rd Cycle)

### CENTRE FOR RESEARCH

ABISHEKAPATTI, TIRUNELVELLI - 627 012, TAMILNADU, INDIA

Phone : (44) 2333741, 9487907009, Intercom: 2545073, Fax : (44) 2333742, Email : [cfre@msu.ac.in](mailto:cfre@msu.ac.in)



**DR. K. SENTHAMARAI KANNAN**  
DIRECTOR

Date : December 22, 2018

REF : MSU/RES/Admn/Jan 2019

### Ph.D., Programme Commencement Order

To

A BANUMATHY  
19 A 32, YADAVA WEST STREET  
PALAYAMKOTTAI  
Tamil Nadu, Thirunelveli, Pincode - 627002  
Mobile No. : 8344026464, Email ID : pksbanu@gmail.com

Sir/Madam,

Sub: Registration for doing Ph.D., programme - Date of Commencement of Research work -  
Intimation - Reg

Ref: Counseling attended by the candidate for January 2019 session.

With reference to the above, you are provisionally registered for Ph.D., Programme as detailed below :

Name of the Scholar	A BANUMATHY
Registration No.	19121192032014
Discipline	Chemistry
Gender / Community	Female / BC
Nationality	INDIAN
PWD Status	Not Applicable
Admission Based On / Mode	PG / PART TIME INTERNAL
Research Centre	Sadakathullah Appa College, Tirunelveli.
Name of the Supervisor	Dr p sengu, Department of Chemistry, Sri K.G.S Arts College, Srivaikuntam Mobile No. : 9443670578, Email ID : paramasivansengu@gmail.com
Name of the Co-Supervisor	NIL
Doctoral Committee Members	<ol style="list-style-type: none"> <li>DR B RAVINDRAN DURAINAYAGAM, Associate professor, department of chemistry, popes college, sawyer puram Mobile No. : 9443290387, Email ID : bravidurai@gmail.com</li> <li>DR M SHEIK MUHIDEEN BADHUSHA, assistant professor, department of chemistry, sadakathullah appa college physical chemistry Mobile No. : 9788749729, Email ID : drbadhusha@gmail.com</li> </ol>
Proposed Title	KINETICS AND MECHANISM OF OXIDATION OF SOME ORGANIC SUBSTRATES WITH Cr VI OXIDISING AGENT
Date of Commencement	22.12.2018

ASSISTANT SUPERINTENDENT     ASSISTANT REGISTRAR

DIRECTOR

Copy To : Supervisor, Co-Supervisor (if applicable) / Research Centre / Doctoral Committee Members





**Sadakathullah Appa College**  
(Autonomous)  
Rahmath Nagar, Tirunelveli - 627011

1	Name of the Faculty with Designation, Staff ID	: Dr. I. ANTONY DANISH Assistant Professor, Department of Chemistry ATCH05
2	Name of the Collaborating Faculty with Designation	: Dr. P. SENGU Associate Professor Department of Chemistry Sri K. G. S. Arts College, Srivaikuntam -628 619 Tamil Nadu
3	Name of the Collaborating Organization	: Department of Chemistry Sri K. G. S. Arts College, Srivaikuntam -628 619 Tamil Nadu.
4	Nature of Collaboration (Academic / Research / Faculty Exchange / Student Exchange / Project / Internship / On-the Job Training)	: Research
5	Nature / Details of Outcome (Guest Lecture / DC member / Co-guide / Project Reports / Other Reports/Publications)	: Co-Guide
6	Period of Collaboration	: From: December, 2018 to Till Date
7	Financial Involvement (if any)	: No
8	Proof Attached	: Yes

Signature of Principal

Signature of the Collaborating Faculty

P. SENGU  
Department of Chemistry  
SRI K.G.S. ARTS COLLEGE  
SRIVAIKUNTAM,

Signature of the Faculty

Dr. I. ANTONY DANISH, M.Sc., Ph.D.  
Assistant Professor,  
Department of Chemistry  
Sadakathullah Appa College (Autonomous)  
Rahmath Nagar, Tirunelveli - 627 011.

**PRINCIPAL**  
**SADAKATHULLAH APPA COLLEGE**  
(AUTONOMOUS)  
Rahmath Nagar, Tirunelveli - 627 011.

3.7.1/Collaborative Activities/2020-21/58



**MANONMANIAM SUNDARANAR UNIVERSITY**  
 Reccredited with 'A' Grade by NAAC (3rd Cycle)

**CENTRE FOR RESEARCH**

ABISHEKAPATTI, TIRUNELVELI - 627 012, TAMILNADU, INDIA

Phone : 0462 - 2333741, 9437607000, Intercom : 233373 Mail : crm@msuniv.ac.in, web : msuniv.ac.in



**DR. K. SENTHAMARAI KANNAN**  
**DIRECTOR**

Date : December 20, 2018

REF : MSU/RES/Admn/Jan 2019

**Ph.D., Programme Commencement Order**

To

PETCHIAMMAL G  
 46, North Street,, Megalingapuram  
 Tirunelveli  
 Tamil Nadu, Thirunelveli, Pincode - 627001  
 Mobile No. : 9940757084, Email ID : gpetchiammal1980@gmail.com

Sir/Madam,

Sub: Registration for doing Ph.D., programme - Date of Commencement of Research work -  
 Intimation - Reg

Ref: Counseling attended by the candidate for January 2019 session.

With reference to the above, you are provisionally registered for Ph.D., Programme as detailed below :

Name of the Scholar	PETCHIAMMAL G
Registration No.	1911192032005
Discipline	Chemistry
Gender / Community	Female / BC
Nationality	INDIAN
PWD Status	Not Applicable
Admission Based On / Mode	M,PHI / FULL TIME
Research Centre	Sadakathullah Appa College, Tirunelveli.
Name of the Supervisor	Dr. P. Sengu, Asso. Professor, , Department of Chemistry, Sri K.G.S Arts College, Srivaikundam Mobile No. : 9443670578, Email ID : paramasivansengu@gmail.com
Name of the Co-Supervisor	Dr. I. Antony Danish, Asst. Professor, , Department of Chemistry, Sadakathullah Appa College (Autonomous), Palayamkottai, Tirunelveli Mobile No. : 9700163932, Email ID : antonydanish@gmail.com
Doctoral Committee Members	1. DR B RAVINDRAN DURAI NAYAGAM, Associate Professor, Department of Chemistry, Popes College, Sawyer Puzam Mobile No. : 0443290387, Email ID : bravidurai@gmail.com 2. DR M SHEIK MUHIDEEN BADIHUSA, Assistant Professor, Department of Chemistry, Sadakathula Appa College, Tirunelveli Mobile No. : 9788749720, Email ID : drbadhuanan@gmail.com
Proposed Title	STUDY OF MECHANISM OF Cr (VI) OXIDATION OF ORGANIC SUBSTRATES
Date of Commencement	20.12.2018

*[Signature]*  
 ASSISTANT SUPERINTENDENT ASSISTANT REGISTRAR

*[Signature]*  
 DIRECTOR

Copy To : Supervisor, Co-Supervisor (If applicable) / Research Centre / Doctoral Committee Members





**Sadakathullah Appa College (Autonomous)**  
Rahmath Nagar, Tirunelveli - 627011

1	Name of the Faculty with Designation, Staff ID	:	P. JESLIN KANAGA INBA Assistant Professor of Chemistry ATCHO4
2	Name of the Collaborating Faculty with Designation	:	J. WINFRED JEBARAJ Assistant Professor of Chemistry
3	Name of the Collaborating Organization	:	St. John's college Palayamkottai
4	Nature of Collaboration (Academic / Research / Faculty Exchange / Student Exchange / Project / Internship / On-the Job Training)	:	Research
5	Nature / Details of Outcome (Guest Lecture / DC member / Co-guide / Project Reports / Other Reports/Publications)	:	DC member
6	Period of Collaboration	:	From: 2018 To: Till date
7	Financial Involvement (if any)	:	No
8	Proof Attached	:	Yes / No
Signature of Principal		Signature of the Collaborating Faculty	

Signature of the Collaborating Faculty  
M.Sc., M.Phil., Ph.D.,  
Assistant Professor  
Research Department of Chemistry  
St. John's College,  
Palayamkottai - 627 002.

Signature of the Faculty



Dr.K.SENTHAMARAI KANNAN  
DIRECTOR

REF:MSU/RES/R1/JULY 2018

Date : 05-July-2018

**Ph.D., Programme Commencement Order**

To

GERSHOM STUART J  
no 37, seenivnsagam B colony  
VM Chathram  
Thirunelveli Tamil Nadu 627011  
Mobile No :9487723576 ,Email Id :gershom.stuart141195@gmail.com

Sir/Madam,

Sub: Registration for doing Ph.D., programme - Date of Commencement of Research work - Intimation-Reg

Ref: Counseling attended by the candidate.

\* \* \* \* \*

With reference to the above, you are provisionally registered for Ph.D., Programme as detailed below :

1. Name of the Scholar : GERSHOM STUART J
2. Registration No : 18211272031030
3. Discipline : Chemistry
4. Gender : Male
5. Social Category (Community) : BC
6. Nationality : indian
7. PWD Status : Not Applicable
8. Admission Based On : PG
9. Name of the Supervisor : Dr J Winfred Jebaraj
10. Name of the Co-Supervisor : NIL
11. Mode : FULL TIME
12. Research Centre : ST. JOHN'S COLLEGE , PALAYAMKOTTAI
13. Date of Commencement : 05.07.2018
14. Proposed Title : SYNTHESIS CHARACTERISATION AND COMPUTER AIDED THEORETICAL STUDIES OF POTENTIALLY DOCKING DRUG CANDIDATES FOR RETEROVIRAL INFECTION
15. Doctoral Committee Members Details :
  1. DR P JESLIN KANAGA INBA  
ASSISTANT PROFESSOR CHEMISTRY SADIKATHULLA APPA COLLEGE  
TIRUNELVELI
  2. DR J MUTHU VIJAYAN ENOCH  
ASSOCIATE PROFESSOR CHEMISTRY KARUNYA UNIVERSITY COIMBATORE

ASSISTANT

SUPERINDENT

ASSISTANT REGISTRAR


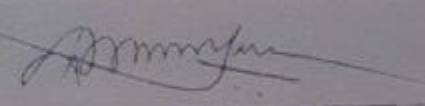

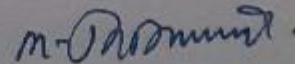
DIRECTOR





## Sadakathullah Appa College (Autonomous)

### Rahmath Nagar, Tirunelveli - 627011

1	Name of the Faculty with Designation, Staff ID	Dr. M. THAMEEM ANSARI ASSISTANT PROFESSOR OF CHEMISTRY ATCH06
2	Name of the Collaborating Faculty with Designation	Dr. R. CHANDRASEKAR PROFESSOR, SCHOOL OF CHEMISTRY
3	Name of the Collaborating Organization	UNIVERSITY OF HYDERABAD (An Institution of Eminence) HYDERABAD, TELENGANA - 500 046
4	Nature of Collaboration (Academic / Research / Faculty Exchange / Student Exchange / Project / Internship / On-the Job Training)	ACADEMIC
5	Nature / Details of Outcome (Guest Lecture / DC member / Co-guide / Project Reports / Other Reports / Publications)	GUEST LECTURE
6	Period of Collaboration	From : 06.06.2020 To : 06.06.2020
7	Financial Involvement (if any)	-
8	Proof Attached	Yes
 Signature of Principal		  <b>Dr. R. CHANDRASEKAR</b> Professor School of Chemistry University of Hyderabad Hyderabad-500046, India
		 Signature of the Faculty



# Sadakathullah Appa College

(Autonomous)

Reaccredited by NAAC at an 'A' Grade with a CGPA of 3.40  
An ISO 9001 : 2015 Certified Institution

## A NATIONAL WEBINAR ON "NANOMATERIALS"

Organized by

**THE RESEARCH DEPARTMENT OF CHEMISTRY**

Resource Person



**Dr. R. CHANDRASEKAR,**

Ph.D. (Max Planck, Germany), FRSC (UK),

Professor

School of Chemistry

University of Hyderabad

(An Institution of Eminence)

Hyderabad-500 046, INDIA

Topic :

**Nanoscience and Technology:  
The Essentials.**



06<sup>th</sup> June 2020



11.00 am to 12.30 pm

**Organizing Secretary**

Dr. M. THAMEEM ANSARI

Assistant Professor of Chemistry

**Convener**

Dr. A. SYED MOHAMED

The HoD of Chemistry

**Organizing Chairman**

Dr. M. MOHAMED SATHIK

Principal

Registration Link : <https://forms.gle/yLwYmbQtpaWEvJcPA>



drmthameem@gmail.com



+91 99520 51636

e-Certificate will be provided


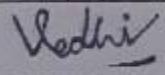
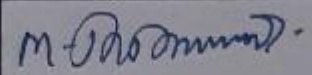


zoom Platform





**SadakathullahAppa College (Autonomous)**  
Rahmath Nagar, Tirunelveli - 627011

1	Name of the Faculty with Designation, Staff ID	:	Dr. M. THAMEEM ANSARI Assistant Professor of Chemistry ATCH06
2	Name of the Collaborating Faculty with Designation	:	Dr. C. VEDHI Assistant Professor of Chemistry
3	Name of the Collaborating Organization	:	V.O. Chidambaram College Thoothukkudi, Tamil Nadu 628008, India
4	Nature of Collaboration (Academic / Research / Faculty Exchange / Student Exchange / Project / Internship / On-the Job Training)	:	Research
5	Nature / Details of Outcome (Guest Lecture / DC member / Co-guide / Project Reports / Other Reports/Publications)	:	Doctoral Committee Member
6	Period of Collaboration	:	From : 30.12.2020 To:30.12.2023
7	Financial Involvement (if any)	:	Nil
8	Proof Attached	:	Yes / No
 Signature of Principal		 Dr. C. VEDHI, M.Sc., Ph.D., ASSISTANT PROFESSOR DEPARTMENT OF CHEMISTRY V.O CHIDAMBARAM COLLEGE THOOTHUKUDI -628008, TAMILNADU, INDIA Signature of the Collaborating Faculty	
		 Signature of the Faculty	



# MANONMANIAM SUNDARANAR UNIVERSITY

Reaccredited with 'A' Grade by NAAC (3rd Cycle)

## CENTRE FOR RESEARCH

ABISHEKAPATTI, TIRUNELVELI - 627 012, TAMILNADU, INDIA

Phone : 0462 - 2333741, 9487907009, Intercem: 2563073, Mail: cfmsu@msuniv.ac.in, Web: msuniv.ac.in



**DR. C. KANNAN**  
**DIRECTOR**

REF : MSU/RES/Admn/July 2020 Session

Date : December 30, 2020

### Ph.D., Programme Commencement Order

To  
MUTHUSELVI M  
5, RAJ KAMAL NAGAR, OPP TO DISTRICT COURT  
Thirunelveli, Tamil Nadu, Pincode - 627002  
Mobile No. : 9994242600, Email ID : muthuselviramya14@gmail.com



Sir/Madam,

Sub: Registration for doing Ph.D., programme - Date of Commencement of Research work - Intimation - reg.

Ref: Counselling attended by the candidate for July 2020 session.

\*\*\*\*\*

With reference to the above, you are provisionally registered for Ph.D., Programme as detailed below :

Name of the Scholar	MUTHUSELVI M
Registration No.	2021192032005
Discipline	Chemistry
Gender & Community	Female & BC
Nationality	INDIAN
PWD Status	Not Applicable
Admission Based On & Mode	PG & FULL TIME
Research Centre	Sadakathullah Appa College (Autonomous), Tirunelveli
Name of the Supervisor with Address	Dr. M. Thameem Ansari, Assistant Professor Department of Chemistry, Sadakathullah Appa College (Autonomous), Palayamkottai, Tirunelveli, 627011 Mobile No. : 9952051636, Email ID : drnthameem@gmail.com
Name of the Co-Supervisor with Address	NIL
Doctoral Committee Members	<p>1. DR A SYED MOHAMED, Assistant Professor &amp; Head, Department of Chemistry, Sadakathullah Appa College (Autonomous), Rahmath Nagar, Tirunelveli - 627011 Mobile No. : 9894388030, Email ID : asm2032@gmail.com</p> <p>2. DR C VEDHI, Assistant Professor &amp; Head, Department of Chemistry, V.O.Chidambaram College, Thoothukudi - 628008 Mobile No. : 9092368104, Email ID : cvedhi23@gmail.com</p>
Proposed Title	SYNTHESIS, CHARACTERIZATION AND APPLICATION OF ADVANCED MAGNETIC HYDROXYAPATITE NANOCOMPOSITE MATERIAL
Date of Commencement	30.12.2020

 ASSISTANT  
 SUPERINTENDENT  
 ASSISTANT REGISTRAR

  
 DIRECTOR

Copy To : Supervisor, Co-Supervisor (if applicable) / Research Centre / Doctoral Committee Members






## Sadakathullah Appa College (Autonomous)

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## An Effect of Eye Check-up Regularity and its Impacts on Glaucoma Severity: An Analytical Study using Structural Equation Modelling

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**Abstract:** Glaucoma is one of the leading causes of blindness, not only in India, but throughout the world. It can be defined as diseases that affect the optical nerves of the eye causing irreversible damage to the vision in the eye. But many people in India are not aware of the real causes of Glaucoma. Since many people are not aware of this disease, people are completely in dark as to what to do to prevent eye blindness, particularly due to Glaucoma. That is the reason why the present research tried to analyse how regular eye check-up can impact the severity of glaucoma among the patients in India. In order to conduct the present research the researcher has chosen 400 respondents using simple random sampling technique. The study revealed that when people go for regular eye check-ups, the severity of glaucoma decreases.

**Keywords:** Glaucoma, Eye.

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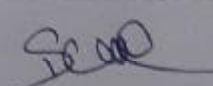
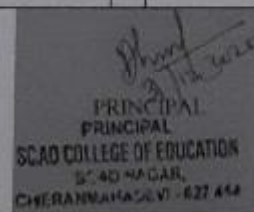
### Introduction

The second leading cause of blindness worldwide is Glaucoma. It is estimated that twelve million people worldwide are blind due to the disease. Primary open angle glaucoma (POAG) is far more prevalent than primary angle-closure glaucoma (PACG) worldwide, with the exception of Asia. In Asia, Chinese and Indian population-based studies have recorded that a large percentage of the population suffers from angle-closure glaucoma. An estimated 28.2 million people in China have angle-closure disease, Foster and Johnson estimated.





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(Approved by the Government of Tamil Nadu and NCTE, Bangalore and Affiliated to Tamil Nadu Teachers Education University, Chennai)

Date: 31.12.2020

**From**

Dr A Beaula,  
SCAD College of Education,  
Cherramahadevi,  
Tirunelveli Dist.

**To**

S Khaleel Ahmed,  
Asst prof in English & Assistant IQAC Coordinator,  
Sadakathullah Appa College (Autonomous),  
Tirunelveli.

**Respected Sir,**

**Greetings from SCAD college of Education!**

We are planning to conduct **Orientation Programme (Students Enrichment Programme)** for our first year students from 07.01.2021 to 12.01.2021 by online mode. In this regards, I would like to invite you as a resource person on 09.01.2021 morning session. We believe that your contribution will be a great benefit to our budding student teachers.

Thanking you

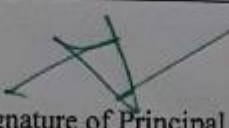
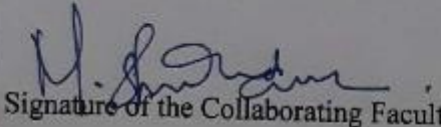



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## Study on Second and Third Order Nonlinear Optical Properties of Triglycine Sulpho Succinate Single Crystals

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**Abstract:** A third orders nonlinear optical single crystals of Triglycine Sulpho Succinate (TGSSu) has been grown by slow cooling method. The grown crystals were characterized using X-ray diffraction analysis technique and its found the grown crystals in monoclinic structures. Thermal analysis of TGSSu crystal were carriedout and its compared to TGS crystal. The second harmonic generation efficiency was studied Kurtz-Perry powder technique. The third-order nonlinearities of grown crystals have been investigated by Z-scan method. Nonlinear refractive index ( $n_2$ ), the nonlinear absorption coefficient ( $\beta$ ) and third-order nonlinear susceptibility ( $\chi(3)$ ) were estimated for the sample. The results were discussed in detailed.

**Key words:** TGS; single crystal; SHG; NLO; Third order nonlinear susceptibility


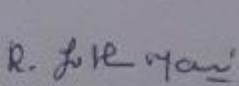
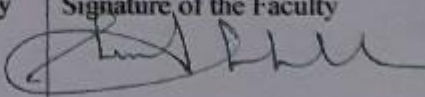
### 1. Introduction

Nonlinear materials have been broadly utilized for media transmission, optical gadgets, signal handling and capacity gadgets. Triglycine Sulfate (TGS) gems as one of the well known NLO material and its have flexible properties for different optoelectronic applications in the obvious and infrared otherworldly ranges and assumed a critical part in the progression of infrared indicators because of the presence of pyroelectric nature in the precious stone. Assortments of actual properties, for example, unconstrained polarization, piezoelectric and versatile properties of TGS precious stones were concentrated by different analysts [1-5]. Despite the fact that numerous scientists have considered the actual properties of TGS, those examinations don't call attention to how to make most extreme bit of leeway of TGS particularly in its function as a facilitator in the utilization of infrared identifiers. TGS is the main ferroelectric material that goes through stage progress above room temperature and accordingly more helpful than other ferroelectric materials in the use of infrared indicators. [6]. In this work, glycine, sulfuric corrosive and succinic corrosive were blended to frame Triglycine Sulpho Succinate (TGSSu) test. The point of this paper is to report and to talk about the subsequent request and third request nonlinear optical properties of





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## Novel synthesis of undoped and zinc doped iron oxide nanoparticles using Apis Mellifera

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### ABSTRACT

Zinc doped iron oxide nanoparticles (NPs) [ $Zn_xFe_{2-x}O_3$  (0%, 3%, 6% & 10%)], have been prepared by auto combustion method. Apis Mellifera acts as reducing/capping agents. X-ray diffraction reveals that Zn ions doping lead to the formation of secondary phases ( $ZnFe_2O_4$ ),  $\alpha$ - $Fe_2O_3$ . The structural deformation on the hematite samples has been observed. The Morphological and elemental compositions were identified by Field Emission Scanning Electron Microscopy (FESEM) and Energy Dispersive Spectroscopy (EDS) confirming the presence of Zinc.

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### 1. Introduction

Iron Oxide,  $Fe_2O_3$  has different crystalline phases like  $\alpha$ - $Fe_2O_3$  (Hematite),  $\beta$ - $Fe_2O_3$ ,  $\gamma$ - $Fe_2O_3$  and  $\epsilon$ - $Fe_2O_3$  (maghemite). It has been noticed that  $\alpha$ - $Fe_2O_3$  (hematite) is the most stable form at low temperatures because of its high thermodynamic stability than any other form with extra advantages such as biocompatibility, non-toxicity, corrosion resistance and eco-friendliness. It possesses hexagonal unit cell based on anion hcp packing similar to that of the corundum  $\alpha$ - $Al_2O_3$  crystal structure [1].

In recent years,  $A_xFe_{2-x}O_3$  nanoparticles have technological and scientific importance due to their new chemical and physical properties compared to bulk materials.  $\alpha$ - $Fe_2O_3$  nanostructures have been used in dye solar cells, photo-assisted electrolysis of water, active components of gas sensors, photocatalysts, ordinary catalysts, field emission, field effect transistors (FET), controlled drug delivery, lithium ion battery electrodes so on and so forth. The effect of substitution in  $\alpha$ - $Fe_2O_3$  at Fe site influences the optical, electrical, magnetic and other physical properties. In addition, several dopant species have been introduced into  $\alpha$ - $Fe_2O_3$  in attempts to control materials properties, including  $Co^{4+}$ ,  $Mn^{4+}$ ,  $Cu^{3+}$ ,  $V^{5+}$ ,  $Bi^{3+}$  and  $Zn^{2+}$  [1,2].

Hence doping with transition metal impurities is a widely applied process in material science that involves incorporation of

atoms or ions of appropriate elements into host lattices to yield hybrid materials with desirable properties and function. Development of new magnetic semiconductors based on the metal doped hematite is a subject of increasing research interest. It is well known that the nature of hybridization and site preference is disturbed by the concentration of doping amount. Since Zn stabilizes as  $Zn^{2+}$ , it leads to the creation of hole in the oxygen (O) valence band and hence modifies the electronic properties of hematite [3].

In this report, we have chosen auto combustion method to synthesize the pure and Zinc doped  $\alpha$ - $Fe_2O_3$  nanoparticle which is a simple, low-cost and environment friendly method. Honey was used as reducing agent, capping agent and stabilizing agent. Further, the structural and morphological characteristics of the synthesized iron oxide nanoparticle have been studied.

### 2. Experimental section

Pure and Zinc doped  $\alpha$ - $Fe_2O_3$  nanoparticle with chemical formula  $Fe_{2-x}Zn_xO_3$  (where,  $x = 0, 0.03, 0.06$  and  $0.1$ ) was prepared by auto combustion method using Iron nitrate [ $Fe(NO_3)_3 \cdot 9H_2O$ , 98%, Merck] and Zinc nitrate [ $Zn(NO_3)_2 \cdot 6H_2O$ , 99%, Merck]. Honey (scientific name- Apis Mellifera) produced by the Marthandam Bee Keeper's co-op Society Ltd., No.2050, Tamil Nadu, India [4] was selected as a reducing and capping agent. Deionized water used as a solvent. The weighed quantities of metal nitrates were dissolved in distilled water and certain volume of honey was added in it under constant stirring at  $80^\circ C$  for 120 mins. The homoge-

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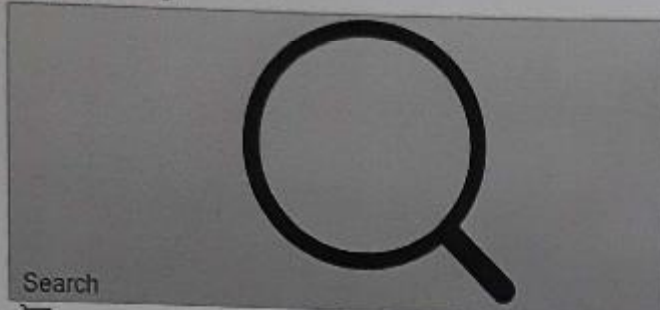
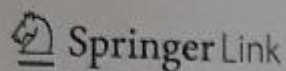
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## Growth, structural, optical, thermal, mechanical and electrical properties of potassium chromium sulphate single crystals

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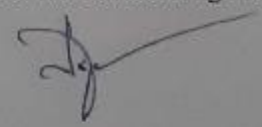
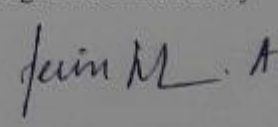
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### Abstract

The inorganic single crystal of potassium chromium sulphate (PCS) was grown by slow evaporation solution technique at room temperature. The grown crystal has been characterized by using UV, FTIR, photoluminescence technique, SHG and Vickers microhardness test and the detailed results have been reported for the first time. The grown PCS crystal was found to be crystallizing in centrosymmetric cubic structure. EDAX analysis affirms the elements present in the sample and substantiate the purity of the grown crystal. Functional groups of the PCS crystal were corroborated by FTIR spectral analysis. The UV-Visible spectrum was examined to determine the optical band gap. Additionally, the linear optical parameters such as extinction coefficient, reflectance, refractive index, dielectric constant, optical conductivity and electrical conductivity were determined. Thermal analysis, in the temperature range of 40–730 K, shows two endothermic peaks at 90 and 170 K. The PL spectrum recorded shows an intense blue emission at 490 nm indicating that the grown crystal can be beneficial for fluorescence in blue LED applications. The microhardness study reveals that the PCS crystal has a high mechanical strength, implying that it can endure significant stress without permanent deformation. The grown crystal was also subjected to second harmonic generation and the results of which has been discussed. PCS crystal could be used for third-order nonlinear optical applications and hence it is a third harmonic generator to produce UV laser light.



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# Antifungal Activity of Iron-gold and Cobalt-gold co-doped ZnO Nanoparticles

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Zn<sub>0.98</sub>Fe<sub>0.01</sub>Au<sub>0.01</sub>O and Zn<sub>0.98</sub>Co<sub>0.01</sub>Au<sub>0.01</sub>O nanoparticles (NPs) have been synthesized via poly ethylene glycol assisted route. The average crystallite size of Zn<sub>0.98</sub>Fe<sub>0.01</sub>Au<sub>0.01</sub>O and Zn<sub>0.98</sub>Co<sub>0.01</sub>Au<sub>0.01</sub>O NPs were estimated from X-ray diffraction results and the values are 31.38 nm and 36.14 nm respectively. The UV absorption spectra confirmed the formation of the NPs with the characteristic peaks at 374 and 366 nm respectively. This spectral observation indicates that the band gap of ZnO nanoparticles decreases by doping iron/gold and cobalt/gold nanoparticles. The morphology and elemental composition of Zn<sub>0.98</sub>Fe<sub>0.01</sub>Au<sub>0.01</sub>O and Zn<sub>0.98</sub>Co<sub>0.01</sub>Au<sub>0.01</sub>O NPs were investigated. The antifungal activity of synthesized Zn<sub>0.98</sub>Fe<sub>0.01</sub>Au<sub>0.01</sub>O and Zn<sub>0.98</sub>Co<sub>0.01</sub>Au<sub>0.01</sub>O NPs were found against four postharvest pathogenic fungi like *Aspergillus niger*, *Aspergillus flavus*, *Rhizopus microsporus* and *Penicillium sp.* The doping of iron and gold in ZnO nanoparticles enhances the zone of inhibition for the fungal pathogens compared to pure ZnO nanoparticles. Antifungal activity of Zn<sub>0.98</sub>Fe<sub>0.01</sub>Au<sub>0.01</sub>O and Zn<sub>0.98</sub>Co<sub>0.01</sub>Au<sub>0.01</sub>O nanoparticles were higher when compared with standard antibiotic *mycostatin* whose zone of inhibition is 18 mm against *Aspergillus niger*, *Aspergillus flavus*, *Rhizopus microsporus* and *Penicillium sp.*

## Introduction

In the past decade research has been focussed on the nano materials over bulk materials because of their novel physical and chemical properties [1,2]. Especially metal oxide nanoparticles have attracted interest because of their dramatic change in their physical and chemical properties [1,2]. Also, it has the application in various fields such as biosensors, catalysts, anticancer and antimicrobial agents [1,2]. Among these metal oxide nanoparticles, zinc oxide is widely employed because it's an essential microelement for humans which exists in proteins and enzymes [3]. It plays a significant role in biomedical applications such as drug delivery and bio imaging due to its non-toxic nature [4]. These biomedical properties are further enhanced by doping with transition elements such as copper, cobalt, nickel etc. Aluminum oxide nanoparticles have trapped the awareness of many researchers due to its great catalytic activities [5]. CuO nanoparticles has grabbed noteworthy attention because of its use as a potential fabrication of gas sensors [6]. The transition element co-doped ZnO can be used for treating diseases like hemophilia, genital blindness, viral infections, heart disease, diabetes and fungal infections [7]. Fungus infections can affect humans, animals and plant products. *Aspergillus* species causes disease in humans rarely but it leads to serious lung disease namely *Aspergillosis* [8].

It is also one of the most common causes of otomycosis (fungal ear infections) which can cause pain and temporary

hearing loss [9]. *Aspergillus* species mainly affect plant products and food during the storage period and also these species frequently appear in tropical and subtropical regions than in temperate climates [8]. *Rhizopus* is a genus of common saprophytic fungi on plants and specialized parasites on animals. They are multicellular and found on a wide variety of organisms. Some *Rhizopus* species are opportunistic agents of human zygomycosis [10]. *Penicillium expansum* can cause severe post-harvest diseases in plants as grey and blue mold. It is also a major producer of *mycotoxin*, *patulin* which is commonly found in rotting apples [11].

Gold is chosen since it is an excellent antimicrobial agent [12]. Cobalt is chosen because iron and cobalt have the same physical and chemical properties and also, they are adjacent to each other in period 4 of the periodic table. ZnO nanoparticles Co-doped with Fe<sup>3+</sup> and Pb<sup>2+</sup> increases the antimicrobial activity against *E.coli* and *S.Aureus* bacteria [13]. The green synthesis of gold nanoparticles have fungicidal effect against *A.flavus* and *A.terreus* [12]. The Fe-ZnO shows the effective antifungal activity against *C.albicans* as compared to that of pure ZnO [14].

Fe doped ceria nanoparticles shows antifungal activity with MIC90 value of 0.48µg/mL against clinical isolates of *C.albicans* [15]. The Antifungal activity of C-doped ZnO nanostructures against *Rhizopus stolonifer* fungus has improved when compared to the undoped ZnO nanoparticles [16]. The pure and Fe doped ZnO nanoparticles exhibit antifungal activity against *Aspergillus*



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4	Nature of Collaboration (Academic / Research / Faculty Exchange / Student Exchange / Project / Internship / On-the Job Training)	Research
5	Nature / Details of Outcome (Guest Lecture / DC member / Co-guide / Project Reports / Other Reports/Publications)	Publications
6	Period of Collaboration	From : 2021 To: 2022
7	Financial Involvement (if any)	-
8	Proof Attached	Yes / No

Signature of Principal

Signature of the Collaborating Faculty

Signature of the Faculty

Dr. D. MUTHURAJ M.Sc., M.Phil., Ph.D.  
Associate Professor  
PG & Research Department of Physics  
The MDT Hindu College  
Tirunelveli - 627 010



**Spectroscopic analysis (Raman, FT-IR, UV, NMR), HUMO, LUMO and first order hyper polarizability calculations of Nor Leucine Maleate (DLNM) using DFT methods**

**A.Zeenath Bazeera<sup>1</sup> Dr.S.Selvaraj<sup>2</sup> Dr.A.Syed Mohamed<sup>3</sup>**

<sup>1</sup> Part-time Ph.D Research Scholar, Reg. No. 12100, Department of physics, M.D.T.Hindu College, Tirunelveli, & Assistant professor, Department of Physics, Sadakathullah Appa College, Tirunelveli, Tamilnadu.

<sup>2</sup> Associate Professor, Department of Physics, M.D.T. Hindu College, Tirunelveli, Tamilnadu.

<sup>3</sup> Assistant professor, Department of Chemistry, Sadakathullah Appa College, Tirunelveli, Tamilnadu.

### **Abstract**

The investigations by various spectroscopic analysis for Nor Leucine Maleate were carried out in this study. The crystal characterizations were done using FT-IR ( $4,000-400\text{cm}^{-1}$ ), FT-Raman ( $3,500-500\text{cm}^{-1}$ ), UV-Vis (200-800nm) and NMR by SCF-GIAO method. HUMO-LUMO analysis for were done. The HUMO-LUMO energy gap of the Nor Leucine Maleate was calculated at B3LYP/6-31G (d, p) level, which aids in the revelation that the energy gap found in this analysis reflects the chemical activity of the molecule. The first order Hyper polarizability was also calculated. Finally, this study aids in the optimization of Non-Linear Optical property of Nor Leucine Maleate for various applications such as optoelectronic devices.


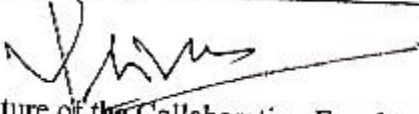
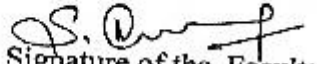
**Key Words :** Nor Leucine Maleate, First order hyper polarizability, HUMO-LUMO, FT-IR.

### **1. Introduction**

The materials which possess optical non-linearity (NLO materials) are of great significance and are used in a number of optoelectronic and photonic devices. Materials which possess the property of optical linearity also has technological importance in areas such as optical communications, optical computing and data storage [1]. The semi-organic and organic materials are given more importance due to their high non-linearity, quick response and great diversities in opto-electric effect when compared to an inorganic NLO material. Organic crystals have a delocalized  $\pi$ -conjugated system [2, 3]. Conjugated donor-acceptor substituted organic materials are known to exhibit good NLO and electro-optical



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5	Nature / Details of Outcome (Guest Lecture / DC member / Co-guide / Project Reports / Other Reports/Publications)	:	publications
6	Period of Collaboration	:	From: 2018 To: 2021
7	Financial Involvement (if any)	:	—
8	Proof Attached	:	Yes / No
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		 Signature of the Faculty	



## Study on Second and Third Order Nonlinear Optical Properties of Triglycine Sulpho Succinate Single Crystals

S.Nazarath Begam<sup>1</sup>, A. Ayeshamariam<sup>2</sup>, M.Sheik Dawood<sup>3</sup>, S.H.Mohamed Ameen<sup>4</sup>,  
M.Sivabharathy<sup>5</sup>

<sup>1,4</sup> Sadakathullah Appa College, Dept of Physics, Tirunelveli-627011, India

<sup>2</sup> Dept of Physics, Khadir Mohideen College, Adirampattinam (Affiliated to Bharathidasan University), Thiruchirappalli, 620 024, India

<sup>3</sup> Sethu Institute of Technology, Department of ECE, Pulloor-626115, India

<sup>5</sup> Sethu Institute of Technology, Department of Physics, Pulloor-626115, India

**Abstract:** A third orders nonlinear optical single crystals of Triglycine Sulpho Succinate (TGSSu) has been grown by slow cooling method. The grown crystals were characterized using X-ray diffraction analysis technique and its found the grown crystals in monoclinic structures. Thermal analysis of TGSSu crystal were carriedout and its compared to TGS crystal. The second harmonic generation efficiency was studied Kurtz-Perry powder technique. The third-order nonlinearities of grown crystals have been investigated by Z-scan method. Nonlinear refractive index ( $n_2$ ), the nonlinear absorption coefficient ( $\beta$ ) and third-order nonlinear susceptibility ( $\chi(3)$ ) were estimated for the sample. The results were discussed in detailed.

**Key words:** TGS; single crystal; SHG; NLO; Third order nonlinear susceptibility

### 1. Introduction

Nonlinear materials have been broadly utilized for media transmission, optical gadgets, signal handling and capacity gadgets. Triglycine Sulfate (TGS) gems as one of the well known NLO material and its have flexible properties for different optoelectronic applications in the obvious and infrared otherworldly ranges and assumed a critical part in the progression of infrared indicators because of the presence of pyroelectric nature in the precious stone. Assortments of actual properties, for example, unconstrained polarization, piezoelectric and versatile properties of TGS precious stones were concentrated by different analysts [1-5]. Despite the fact that numerous scientists have considered the actual properties of TGS, those examinations don't call attention to how to make most extreme bit of leeway of TGS particularly in its function as a facilitator in the utilization of infrared identifiers. TGS is the main ferroelectric material that goes through stage progress above room temperature and accordingly more helpful than other ferroelectric materials in the use of infrared indicators. [6]. In this work, glycine, sulfuric corrosive and succinic corrosive were blended to frame Triglycine Sulpho Succinate (TGSSu) test. The point of this paper is to report and to talk about the subsequent request and third request nonlinear optical properties of



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5	Nature / Details of Outcome (Guest Lecture / DC member / Co-guide / Project Reports / Other Reports/Publications)	:	Publications
6	Period of Collaboration	:	From : 1.6.2020 To: 31.12.2021
7	Financial Involvement (if any)	:	-
8	Proof Attached	:	Yes

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Signature of the Faculty

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## Some salient feature of topological simple ring

U. Jerseena<sup>1\*</sup>, S. Syed Ali Fathima<sup>2</sup> and K. All<sup>3</sup>

### Abstract

In this paper, we manifest the distinct feature of topological simple ring. A topological simple ring has the algebraic structure of ring and topological structure of a topological space. Further we provide a view of some basic results and theorem related to topological simple.

### Keywords

Topological space, Continuous function, Topological ring, topological simple ring, ideals.

### AMS Subject Classification

54Hxx, 54C05.

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### 1. Introduction

This paper attributes the concept of topological simple ring. Also here we elucidate some examples and basic results related to topological simple ring.

The concept of topological ring was introduced by D. Van Dantzig and N. Jacobson introduced the totally disconnected locally compact ring and Kalpanasy introduced the compact ring. Later the concept of topological ring was developed and studied by S. Warner[6]. Koteswara Rao introduced the topological 3-ring.

### 2. Preliminaries

In this section, we recall some definitions and basic results of Topology and algebra which will be used throughout the paper.

**Definition 2.1.** [3] A topology on a set  $X$  is a collection  $T$  of subsets of  $X$  having the following properties

- (i)  $\phi$  and  $X$  are in  $T$
- (ii) The union of the elements of any subcollection of  $T$  is in  $T$
- (iii) The intersection of the elements of any finite subcollection of  $T$  is in  $T$ .

A set  $X$  for which a topology  $T$  has been specified is called a topological space.

**Definition 2.2.** [3] A subset  $U$  of  $X$  is an open set of  $X$  if  $U$  belongs to the collection  $T$ . The complement of open set is called closed set.

**Definition 2.3.** [3] Let  $X$  and  $Y$  be topological space. A function  $f : X \rightarrow Y$  is said to be continuous if for each open subset  $V$  of  $Y$ , the set  $f^{-1}(V)$  is an open subset of  $X$ .

**Definition 2.4.** [3] Let  $X$  and  $Y$  be the topological space; let  $f : X \rightarrow Y$  be a bijection. If both the function  $f$  and the inverse function  $f^{-1} : Y \rightarrow X$  are continuous, then  $f$  is called a homeomorphism.

**Definition 2.5.** [6] A topology  $T$  on a ring  $A$  is a ring topology and  $A$  furnished with  $T$  is a topological ring if the following conditions hold

- (i)  $(x, y) \rightarrow x + y$  is continuous from  $A \times A \rightarrow A$
- (ii)  $x \rightarrow -x$  is continuous from  $A \rightarrow A$
- (iii)  $(x, y) \rightarrow xy$  is continuous from  $A \times A \rightarrow A$ .

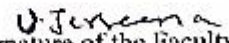


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6	Period of Collaboration	:	From : 1.1.2021 To: 31.12.2021
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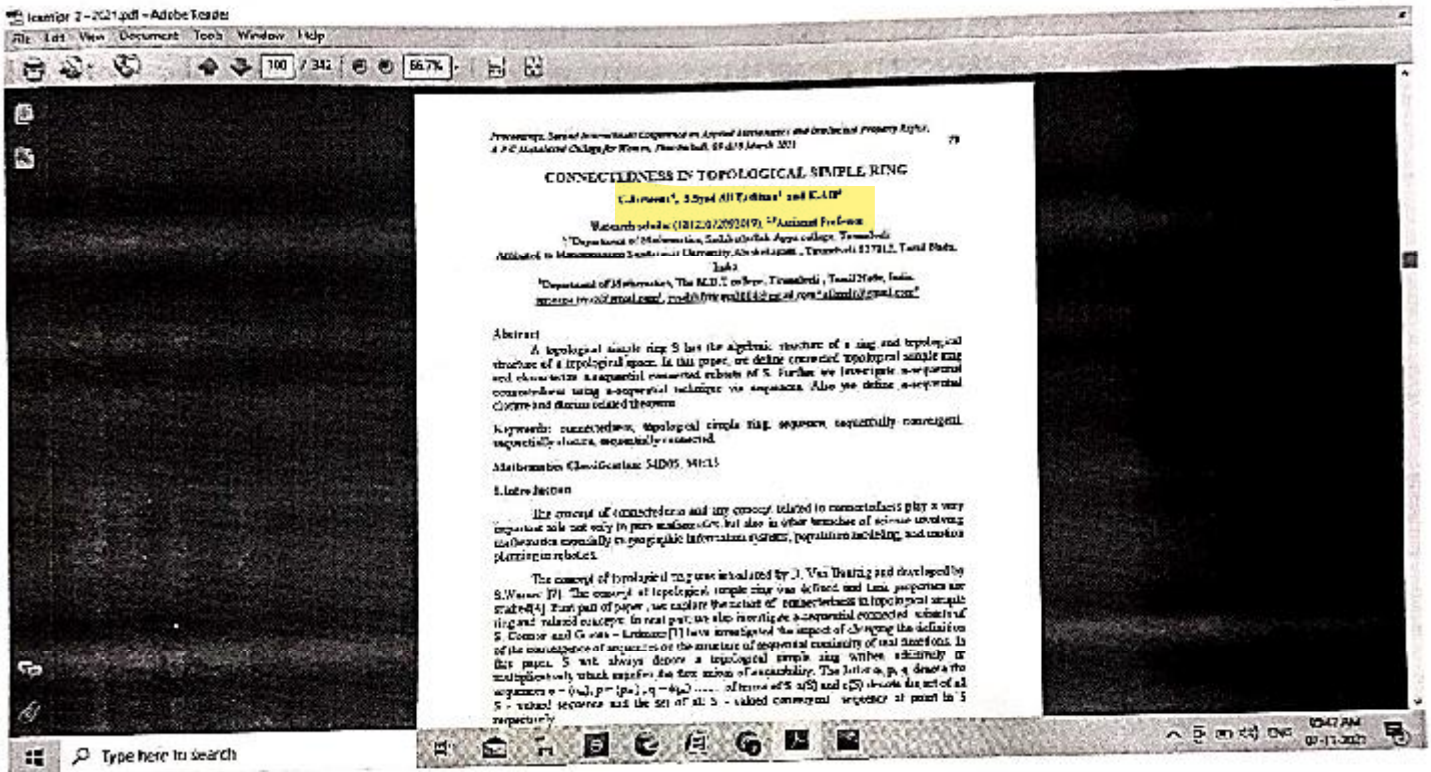
  
Signature of the Faculty

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TIRUNELVELI - 627 010

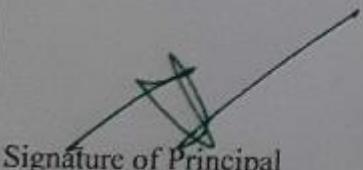
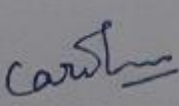
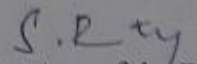


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4	Nature of Collaboration (Academic / Research / Faculty Exchange / Student Exchange / Project / Internship / On-the Job Training)	: Research
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		 Signature of the Faculty



## CLIMATIC IMPACT ON WATER RESOURCES: EFFECT AND PREVENTION

**Dr. S. Mohamed Ramlath Sabura**

*Assistant Professor, Sadakathullah Appa College,  
Tirunelveli*

**I. Caroline Mano Gracia**

*Assistant Professor, Pope's College,  
Sawyerpuram*

### Introduction


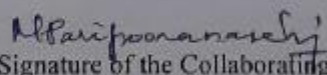
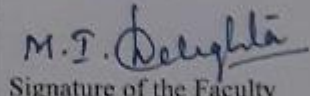

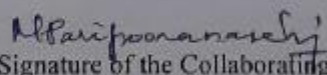
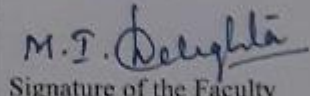

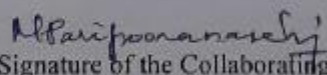
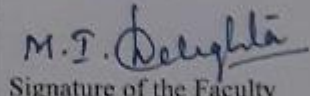
Climate is the condition of a place with regard to temperature, wind, humidity in the air etc. The climate of a region certainly affects the water resources like wells, ponds, small tanks etc. High temperature, polluted air and low percentage of humidity in the air all these have strong effects on water resources like drying of domestic wells, decrease in ground water level and poor rainfall. These in turn lead to drought and poverty. According to NASA's research, the last five years have been considered the hottest in the history of observations<sup>1</sup>. Among the inevitable consequences of climate change, the most important is its impact on water resources — the basis of environmental well-being, economic growth, and global security<sup>2</sup>.

### Climatic Changes

Water resources are important to both society and ecosystems. We need a reliable and regular supply of drinking water to sustain our health. For, human body contains 70% water in its various secretions, blood etc. We also need water



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5	Nature / Details of Outcome (Guest Lecture / DC member / Co-guide / Project Reports / Other Reports/Publications)	: Publications			
6	Period of Collaboration	: From : October, 2020 To: January, 2021			
7	Financial Involvement (if any)	: Shared publication fee			
8	Proof Attached	: Yes / No			
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 Signature of Principal	 Signature of the Collaborating Faculty	 Signature of the Faculty			



## CLIMATE CHANGE: RISKS AND RESCUE OF MARINE ORGANISMS

**Dr.M. Paripooranaselvi**

*Assistant Professor, P.G. & Research Department of Zoology,  
St. Mary's College (Autonomous), Thoothukudi.*

**Dr.M.I. Delighta Mano Joyce**

*Assistant Professor, PG Department of Zoology,  
Sadakathullah Appa College (Autonomous), Tirunelveli.*

### Introduction


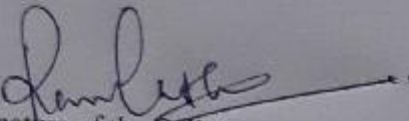
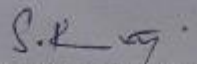
The fifth largest planet of the solar system – Earth, is the only planet known to have an atmosphere containing free oxygen and oceans of water on its surface and to maintain life. Naturally earth has green house effect. The green house effect is the trapping of energy from the sun by certain gases in the atmosphere leading to rise in earth's temperature. Carbon dioxide, nitrous oxide, methane, water vapour and chlorofluorocarbon absorb and reflect infra red waves radiated by earth and hence conserve heat as in a green house. All the living organisms need this green house effect for its survival. If not, the earth will be cooled and ice will cover the earth from pole to pole.

The most abundant green house gas is CO<sub>2</sub> which comes to the atmosphere due to anthropogenic and natural activities. CO<sub>2</sub> is removed by plants through photosynthesis and absorbed by ocean water. But human activities such as burning of fossil fuel, solid wastes, wood products etc increase CO<sub>2</sub> in the atmosphere. This release of CO<sub>2</sub> is at faster rate than



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6	Period of Collaboration	:	25.11.2020
7	Financial Involvement (if any)	:	-
8	Proof Attached	:	No
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Govindammal Aditanar College for women  
Tiruchendur

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Department of Zoology  
Presents Live Webinar On  
*Importance of Oral Health during pandemic*



Dr.S.Mohamed Ramlath Sabura  
Assistant Professor of Zoology  
Sadakathullah Appa College,  
Tirunelveli

🕒 25.11.2020 Wednesday 3:30 PM - 4:30

▶ *Link*

<https://meet.google.com/nxv-xyyt-gbv>

*With warm regards*

Dr.P.Jeyanthi  
Principal

Dr.P.Kumutha  
Convener and Hea

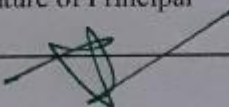
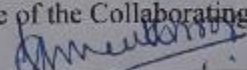
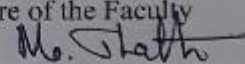
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Organizing Committee

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3	Name of the Collaborating Organization	:	S. A. Raja Pharmacy College, Vakakangulam.
4	Nature of Collaboration (Academic / Research / Faculty Exchange / Student Exchange / Project / Internship / On-the Job Training)	:	Project
5	Nature / Details of Outcome (Guest Lecture / DC member / Co-guide / Project Reports / Other Reports/Publications)	:	Project Reports Plant Authentication
6	Period of Collaboration	:	From : 2018 To:2020
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Registration Fees	
Attendance Certificate	
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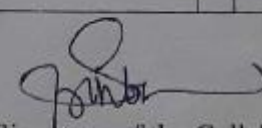
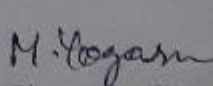
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# SECURE ASSOCIATION RULE MINING ON VERTICALLY PARTITIONED DATA USING FULLY HOMOMORPHIC ENCRYPTION

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## Abstract

Cloud Computing is a leading innovation technology that guides to access applications over the web. The data owner's data can be gotten to and controlled in the cloud. Privacy has become conclusive in information-driven applications within the distributed outsourced information. There are numerous inquiries still coming up on the best way to accomplish a confided in a climate that monitors application and information in the cloud from unapproved users. For offering protection to the users, sporadically there is a need to encode the data before accomplishing any other process. The cryptography method is embraced for data privacy. In this paper, a privacy-preserving construction is intended for vertically partitioned data in the cloud with the assistance of the Fully Homomorphic Encryption method. In this work, the homomorphic encryption and the Fully Homomorphic Encryption method is taken into consideration. The performance of the Rule mining algorithm namely Eclat is compared with the encryption algorithms. The examination result shows that the Fully Homomorphic Encryption is less time-consuming to generate rule in the cloud, regardless of the number of transactions.

## Keywords:

Frequent Itemset Mining, Association Rule Mining, Homomorphic Encryption, Fully Homomorphic Encryption, Eclat

## 1. INTRODUCTION

Locating Several Information proprietors can stow data as a joint database in the cloud. Data owners accept that the information put away in the cloud is secure with no spillage. All information proprietors will have their exchange segments in the joint database. Data are partitioned as horizontal and vertical in the cloud and the trade secrets and client privacy of a transaction are included. To mine the most esteemed information, privacy-preserving mining is applied to the cloud data. Encryption -based methodology is taken into account in the privacy-preserving data mining atmosphere [1]. Two or a lot of parties mine their information within the cloud with collaboration but nobody is eager to expose their information.

In Transactional information, concealed patterns and relationships are applied to shield the information. Encryption is used to protect the data from third parties. To convert the plain text into ciphertext is termed as encryption, whereas the opposite technique of encryption is known as decryption. In this paper, the computational time of Homomorphic encryption and Fully Homomorphic Encryption are compared. Homomorphic encryption adopts algebraic procedures on the cipher text whereas Fully Homomorphic Encryption return only the encrypted result.

Data mining techniques such as frequent itemset [2] and association rule mining [3] are applied to the transaction data to find the frequent items obtained by the customer. To conceal sensitive items from an unapproved client, the relation between frequent items in a transaction is to be found. This is because to

assess customer conduct in business. Frequent Itemset in a transaction is produced by all items-sets whose support  $\geq$  minsup [4] [5]. If a set of frequent items have been discovered, then the Association Rules are generated in a transaction.

In this work, the main task is to keep up the security and protection for the information that is transferred and not to allow the unauthorized clients to access the data. Fake transactions are added to the original data in the transaction against frequency analysis-attack. Association Rule mining algorithm namely Eclat is adopted for building Association Rule with different  $k$ -values, where  $k$  signifies the items in a transaction. The result depicts that Eclat algorithm for Fully Homomorphic Encryption consume less time for rule generation in cloud when compared to homomorphic encryption.

## 2. RELATED WORK

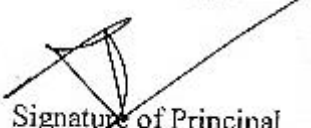
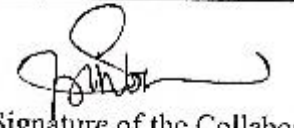
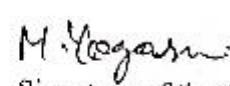
Tremendous exploration work had been conveyed in the most recent years. Different procedures had been proposed for the privacy-preserving outsourced data. A portion of the refereed works are ephemeral.

Sandeep and Liji [6] proposed the Advanced Encryption Scheme (AES) Algorithm. This technique scrambles the information before redistributing to avoid the weakness of 'Known Plaintext' assault in the current framework. In this system various information proprietors can do the mining assignments cooperatively. Eclat Algorithm had used to perform mining tasks in the database. Even though the execution time is prominent, it gives better security to the information things and Utilization of assets at the information proprietor's side less. Pallier Encryption method was proposed by Priya et al. [7] to protect the data from unauthorized users. FP-Growth algorithm was adopted by the author and it has perfect execution over Apriori. The result depicts that this method is flexible for a large number of transactions and provides effective security to the data. This framework takes less execution time in terms of privacy concern.

Rozenberg et al. [8] proposed Two-parties and N-parties algorithms to discover large itemsets in a vertically distributed transaction. These algorithms were depended on the utilization of fake transactions. Master and Slave technique is implemented. It adopts the N-1 slave technique ie. There is N-1 slaves and one Master is participated in a transaction. The Master do the overall calculations and encourage the results to slaves. For each proposed algorithm the author gave and examination of its security and revealed data measure. This method accomplishes great security and protection with less computational cost. Xun and Tao [9] proposed efficient Fully Homomorphic Encryption for security purpose. Cipher text framework activities in Gentry, Sahai and Waters (GSW) and vector additions in Ducas and



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## Analysison PrivacyPreservationin Vertically Partitioned Datain Cloud Using Homomorphic Encryptionand Rule Mining Algorithms

M.Yogasini, Dr.B.N.Prathibha

### Abstract


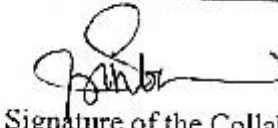
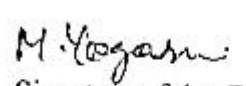
*Privacy has become decisive in knowledge-driven applications in the distributed outsourced data. In cloud, data are fragmented as horizontal and vertical partition and it is very challenging for the data owners to protect their private data from unauthorized users in the outsourced database. To ascertain security, the cryptography technique is adopted with public key secured document in the cloud. In this paper, a privacy-preserving architecture is designed for vertically portioned data in cloud with the help of Homomorphic encryption. Two popular data analysis techniques, Frequent Itemset Mining and Association Rule Mining are adopted to build the Association Rule among the Frequent Items in an encrypted transaction of vertically partitioned database. In this work, rule mining generation algorithms such as Eclat, Apriori and FP-Growth are taken for analysis in terms of computation time and scalability of data. The analysis result shows that eclat algorithm is less time consuming to generate rule in the cloud, irrespective of number of transactions.*

**Keywords:** Frequent itemset, Encryption, Eclat, Apriori, FP-growth, Association Rule Mining

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## Codon modulo cryptosystem for privacy preservation of vertically partitioned outsourced data

M. Yogasini, B.N. Prathibha

### Abstract

Data passes crossways the cloud by the methods of assorted way. It is fundamental to safeguard the data from unapproved users to access the information in any structure. The information refuge is guaranteed by changing a plain text into an incomprehensible configuration by encoding text utilizing cryptographic calculations and these techniques are espoused for scrambling the text to made sure about their data from aggressors to guarantee data protection. Deoxyribo Nucleic Acid (DNA) is an encryption method utilized to provide security to the distributed computing data. In this paper Codon Modulo Cryptography-based Algorithm for vertically partitioned data is applied for privacy concerns. Affiliation Rule Mining and Frequent Itemset strategies are applied to aggregate the Association Rules among the Frequent Items in a scrambled exchange of vertically partitioned information base. The exhibition of Rule Mining calculations such as Apriori, FP-Growth and Eclat with the proposed Codon Modulo algorithm is contrasted with the conventional Homomorphic Encryption.

Full Text: [PDF](#)

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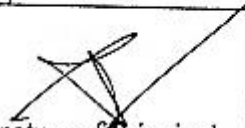


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## MRI RECONSTRUCTION USING COMPRESSED SENSING WITH LOCAL BINARY PATTERN FOR MULTI-DOMAIN VIA CONVOLUTION NEURAL NETWORK

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2. Assistant Professor, Department of Computer Science, St Xaviers College, Affiliated to Manonmaniam Sundaranar University, Abishekapatti, Tirunelveli, Tamilnadu, India

### ABSTRACT:

Compressed Sensing method suppress the MRI acquisition time for considering the patient's health. So the sensing process is carried out by a way of projecting an under-sampled data from spatial and k-space domain simultaneously. In this paper, our proposed Multi-domain reconstruction net acquires the under-sampled data with local binary pattern at the different sampling rates and reconstructs the resultant under-sampled data through the MD-USLBPRNET. Our proposed MD-USLBPRNET consists of two parallel channel and act together sections and also execute on spatial and k-space domain data simultaneously. Experimentally, the proposed method shows the performance better than the existing Deep learning method with the qualitative metric such as Peak-Signal-to-Noise Ratio and Structural Similarity Index.

**Keywords:** *Compressed Sensing, Local Binary Pattern, MRI Reconstruction, Multi-domain Reconstruction Net*

### 1. Introduction

Magnetic resonance imaging technology is noninvasively for gathering the information about physiological functions of human body. MRI is excellent for other modalities like soft-tissue contrast and resolution. But in k-space, the sampling process of MRI suffers from the patient's health for long time acquisition due to physiological and hardware constraints. So this long time acquisition creates some artifacts for reducing the image quality. These problem make an unsuitable diagnosing a time-critical disease like stroke [1]. So MRI reconstruction method is implemented by Compressed Sensing.

CS joins compression and sensing or acquisition. Here the under-sampled data are collected at a few numbers of measurements [2]. The high dimensional data is analyzed in medical regions such as MRI and CT, audio or video or image [3]. So the CS mechanism is very important for this kind of analysis.

The compressed representation of the testing signal is held by CS sensing mechanism. It is examined by sensing or projection matrix. A well-known algorithm like Basis Pursuit [4] is a predictable CS method and provides the time complexity of the number of measurements  $O(s \log(n/s))$  in the  $n$ -dimensional  $s$ -sparse signal based on Gaussian random matrices [5]. The significant problem of BP that random matrices are typically considered to build hardware is complicated. Also, arbitrary matrices multiply with signal vectors of high dimension. If there is no fast matrix multiplication algorithm, it evaluates the high computation cost. In this article, a new CNN method proposes reconstructing the image for the fusion of spatial and frequency under-sampled data.



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## Residual encoder-decoder up-sampling for structural preservation in noise removal

D. M. Annie Brightly Christilin<sup>1</sup> · Dr M. Safish Mary<sup>2</sup>

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### Abstract

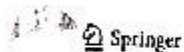
While denoising 3D MRI, structural preservation is a very critical process in the medical region. However, Rician noise in MRI has affected the image quality which is complicated for diagnosing the disease like a brain tumor. So the Rician noise removal process is introduced in this article using filters based method named Residual Encoder-Decoder Up-sampling Non-Similar Wasserstein Generative Adversarial Network (REDUPNSWGAN) which preserves the structural similarity between the neighborhood slices in 3D configuration is utilized as GPU. Residual auto-encoders are connected with De-convolution processes that are sent to the Generator Net (GNET). Furthermore, to reduce the level of Huber loss, the perceptual loss for similarity is implemented by the extraction of the feature space using Average-pool Net (AVGNET) which is incorporated with Huber loss, signed structural non-similar loss and Wasserstein Adversarial loss to form the REDUPNSWGAN loss. Experimentally, this proposed method shows better performance quality based on mean PSNR than REDWGANVGG19 and also time complexity based on training and testing period which shows better than REDWGANVGG19. Particularly, the proposed network Residual Encoder-Decoder Upsampling Non-Similar REDUPNSWGAN reduces the noise level and preserves the structural similarity.

**Keywords** Rician noise · Wasserstein GAN · REDUPNSWGAN · Signed structural non-similar loss, Huber loss, AVG loss

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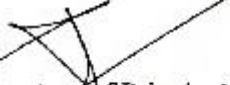

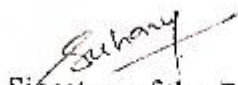
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## AUTOMATED 3D VISUALIZATION OF BRAIN TUMOR USING FCPPN ARCHITECTURE IN MR IMAGES

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### Abstract:

Medical Imaging is a technique that is used to process the various parts of the body and diagnoses the diseases and further treatment is made for the disease. Medical Imaging includes MRI Scans, CT Scans, Mammograms, and so on. The most commonly used Medical imaging is MRI. The location of the brain tumor in Magnetic Resonance Imaging (MRI) is a very critical yet perplexing undertaking, in which various segmentation techniques get evolved. This paper aims to get an accurate view of the tumor. In this paper, the image is segmented using the technique called FCPPN(Fully connected pyramid pooling module) and the segmented image is in the 2D image[1]. It is converted into a 3D image by a marching cube algorithm that is used for rendering medical data[2].The segmented tumor of the proposed algorithm are compared with 3D volume rendering of FCPPN using performance metrics.

**Keywords:** FCPPN-Fully Connected Pyramid Pooling Network ,GP-Genetic Programming,3D-Three Dimension,

### 1.INTRODUCTION

Medical Imaging plays a vital role in current medical research studies. Medical imaging needs an image processing technique for segmentation and 3D visualization. We focus on Brain MRI images in Medical Imaging. The human brain is the central organ of the human nervous system with the spinal cord that makes up the central nervous system. Most of the human brains are affected by tumors, Masses, and increased pressure. In this paper, we aim to identify the tumor and 3D view of the tumor.

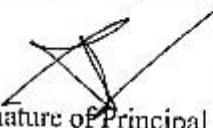


To detect the tumor the brain is segmented either manually or automatically. There is some drawback in manual segmentation and to overcome the drawback there is a need for automatic segmentation. There are various types of segmentation techniques and in our paper, the image is segmented using FCPPN.

The conversion of 2D to 3D gives a clear view of the brain. The 2D image shows only the height and width of the brain. The 3D reconstruction of the tumor helps the physicians in identification, surgical planning, and biological investigation. The 3D images show the depth assessment of an image. When depth is shown, the created left view and right view images yield the ultimate 3D reconstruction outcomes[3]. The 3D image provides more information and gives a better real-time world experience



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## SPARSE REPRESENTATION USING COMPRESSED SENSING VIA DEEP LEARNING

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**Abstract:** Since the patients are not static during the MRI acquisition, the image formation process can create some artifacts that could reduce the photograph quality. The Compressed Sensing (CS) mechanism is hired for reconstructing the unique picture from the given sparse data. Accordingly, CS can be applied to reduce the acceleration time for an MRI test considering the patient's health. So the sensing process is carried out by way of a projection matrix for reconstructing the sparse signals from a few numbers of measurements. The CS guarantees the healing of an authentic picture with an excessive possibility based totally on random gaussian projection matrices. However, sparse ternaries projections (Latin word)-1, zero, +1 are more apt for hardware implementation. The proposed deep learning technique is hired in this article to acquire very CS sparse ternary projections. The STDAENN architecture incorporates the sensing layer for the projection matrix and a reconstruction layer for non-linear sparse matrix continuously by auto-encoder. The overall performance of the proposed STDAENN method is compared with the present strategies primarily based on the imply top signal-to-noise ratio (PSNR) to check the picture nicely.

**Keywords:** compressed sensing; deep learning; sparse ternarius (Latin word) projections.

**2010 AMS Subject Classification:** 65Y04.

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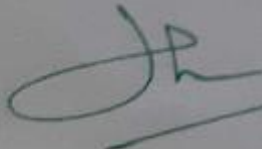


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## Investors Satisfaction Towards Post Office Savings Schemes In Tirunelveli City

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### ABSTRACT

This study attempts to find out the factors behind the motivation of investments in Post office savings schemes in Tirunelveli city. Savings and investments are part and partial of the daily life of human beings. In modern days, the avenues of investment are available in plenty and in which post office savings schemes are one of the traditional and popular mode of investments. Post offices in India are one of the largest networks among the world countries and could reach every nook and corner of the country. Post offices are easily reachable to the people living in rural areas and most middle income group people are preferring post offices for their savings. Post office savings schemes attract and encourage savings and investment habit among the rural, semi-urban and urban areas in the country.

**Keywords:** *Savings schemes, Kisan Vikas Patras, savings account, recurring deposit, Senior Citizen Saving scheme, National saving certificate etc.,*

### INTRODUCTION

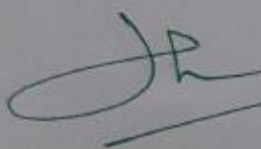
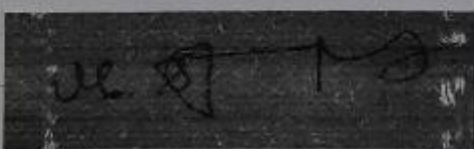

Saving is vital for life of the human being and savings provides life security. One of the major motives of the Department of Post in India is to encourage the savings of the people. Savings not only beneficial to the people but also contribute to the economic development of the nation. The savings schemes provided by post offices are non-marketable. Moreover, the major investments in post offices are exempted from taxes. Post offices offers both fixed and savings accounts facilities to the public. There is also a recurring deposit scheme which is an instrument of regular monthly savings. National Saving Certificates (NSC) are also issued by the post offices to the potential investors. The Department of posts (DOP) merchandise in the name of 'India post'. India post was founded in the year 1854 by Lord Dalhousie and it is the world's largest postal system with wider distribution. India Post engages in the activities of delivering mail is one of the important function and other activities include providing money order, accepting deposits from savings schemes, providing Life Insurance under Postal Life Insurance schemes. The post offices also provides the facilities like Old Age pension payment, MGNREGS wage disbursement, electricity bill payment etc.,

### REVIEW OF PREVIOUS STUDIES

Sasikala V, Selvaraj (2017) found in the study that postal savings schemes like Indra Vikas Patras and Kisan Vikas Patras are more attractive to investors but worried of reduction in interest rates may show the negative impact among the customers. The Post office savings account is one of the major and popularly spread across all the post offices in the country. The postal network in the country was highly appreciated and best in reaching the rural population of the country. Children's education and marriages are the common purpose of Investments among the customers in postal savings.



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**AN ANALYTICAL STUDY ON INVESTMENT BEHAVIOUR OF NRIs IN TAMILNADU**

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**Abstract**

The number of Non Resident Indians and their quantum of remittances in the Tamil Nadu state have been increasing at a remarkable rate. The surveys conducted by the Dept.of Economics and Statistics, Tamil Nadu and the Kerala Migration Survey (KMS-2014) by Prof Zachariah and Prof. Irudaya Rajan (CDS, Kerala) reveals that remittances sent by the NRIs provides exodus support to at least one-sixth of the total population of the Tamil Nadu state. Tamil Nadu state receiving an alarming quantity of remittance of NRIs but it is sure that these contributions are not productively channelised by concerned government. The present topic is mainly selected to analyse the investment behaviour of NRIs especially Tamilians. According to official data, NRI deposits in Tamil Nadu have now crossed the magic figure of Rs 1.5 lakh crore, increasing quickly by more than 27% from Rs 103,884 crore to Rs 118001 lakh crore at the end of 2017-18. Remittances from NRIs are the foundation stones of the Tamil Nadu economy. The purpose of this study is to identify the relationship of the factors that affect the investment behaviour of Non Resident Indians of Tamil Nadu.

**Keywords:** NRI's, Investment Pattern, NRI Investors

**Prelude**

Everyone knows that NRIs are really the strongest foundation of Tamil Nadu economy. A substantial financial investment in infrastructural sector in Tamil Nadu is the contribution of NRIs. Financial investment from NRIs is to be utilised in such a way as to helps the development of not only individuals but the state and nation also. Construction and modification of palatial houses have a demonstration effect in our society. After 90's there were lot of attractive investment platforms in India to channelize the remittance of NRIs to the productive sectors which provides double sided benefits ie., for both NRI's and the country. However, the recent trends in NRIs investment behaviour shows that the investment is more confined to the traditional sectors such as real estate, business, gold etc.. This makes the study more relevant in the socio economic condition of Tamil Nadu state.

**STATEMENT OF THE PROBLEM**

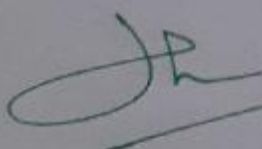


The present topic is mainly selected to analyse the investment behaviour of NRIs especially Tamil Nadu people. According to official data, NRI deposits in Tamil Nadu have now crossed the magic figure of Rs 1.5 lakh crore, increasing quickly by more than 27% from Rs 103,884 crore to Rs 118001 lakh crore at the end of 2017-18. Remittances from NRIs are the foundation stones of the Tamil Nadu economy. The purpose of this study is to identify the relationship of the factors that affect the investment behaviour of Non Resident Indians of Tamil Nadu.

**Objectives of The Study**

- To identify the belief on getting return from Tamil Nadu investment
- To study the satisfaction level of NRI investors.
- To analyse relation between NRIs' Investment behaviour and decision factors.
- To analyse the influence of education, religion and employment status in the investment portfolios of NRIs in Tamil Nadu.



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## Investments In The Shares Of Axis Bank And Icici Bank - A Comparative Study

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### ABSTRACT

This study aims to bring out the investment climate in private sector banks in India by analyzing the most prominent private sector banks namely Axis bank Ltd and ICICI Bank. ICICI Bank and Axis Bank are the two major private sector banks that attracts the customers across the country. Private sector banks are offering a great service to the individual and corporate customers. The Public sector banks are the biggest challenge to private sector banks in building confidence among the people. The recent economic slowdown in our country due to crash in the demand side and global economic slowdown due to pandemic spread results in the poor banking and leading to bank insolvency. The bankruptcy is the important term that are found in daily newspapers due to increase in the Non-Performing Assets of the banks in the country. This study attempts to analyze the performance of private sector banks in the recent economic situation prevailing in India.

**Keywords:** ICICI Bank, Axis Bank, Nifty fifty, stock exchange, Bankruptcy, Nifty returns, beta, SEBI, etc.,

### INTRODUCTION



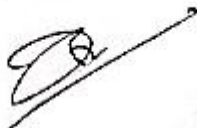
Share market is a place for buying and selling of securities. It is not just a place for buying and selling and it acts as an indicator of the economy. According to technical analysts, the share markets are very sensational to emotions, here says, economic situations across the globe and within the country. Natural disaster and epidemic may also affect the trading activities in the market. The hopes and common beliefs on politics also brings the market to a new place. The share market is also known as secondary market or stock exchanges. Investments in the banking companies may help to understand the current economic scenario and also we can predict the future. Banking sector plays a crucial role in the development of the country in all directions. Banking means basically accepting the deposits from the public and lending the money to the needy people. Banking assists the business people for easy mobilization of money from one place to another and from country to country. Lending activity of Banking companies are building the country both economically and non-economically. Both Public sector and Private sector banks are the major players in the lending market and contribution to the development of the economy. Recent crash in banking companies arises panic among the public towards the safety of their investments. This study may help to understand the accountability of the banking companies and the situation prevailing in the sector. Without banking there is no business today.

### BANKING SECTOR IN INDIA

Accepting of deposits from the public and lending the money to needy people is the basic concept and function of a banking company. At present, the banking function has been diversified into all fields and



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**Heritage**

## **Investors Satisfaction towards LIC Policies in Tirunelveli**

**DR. M. SIRAJUDEEN,**

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**MR. J. ABDULKHADER,**

Ph.D. (P.T.) Research Scholar in Commerce, Jamal Mohamed College (Autonomous), Affiliated to Bharathidasan University, Tiruchirappalli - 20.

### **Abstract**

*This study on Investors satisfaction towards LIC Policies in Tirunelveli attempts to find out the satisfaction level of LIC policy holders and their preferences towards LIC policies among various avenues of investment. In particulars the choice of various policies are also discussed in this study. Investment is a commitment of funds made in the expectation of some positive rate of returns. Returns are the income which may be interest, dividend, premium and capital appreciation. Among the various avenues of investment, the investment in Life Insurance Corporations policies are more popular and very attracted by the investors. Life Insurance Corporation is the company owned and governed by the government of India. The LIC offers various policies to their customers and still leads as a market leader in the Life insurance sector in our country. This study also attempts to find the preferences of policies chosen by the policy holders.*

*Keywords: Investors, LIC policies, Endowment policies, Tirunelveli, Premium, etc.,*

### **Introduction**

Investment is the commitment of funds in the expectation of positive rate of return. Incomes earned by the people are utilized for the present consumption and future consumption. The surplus of income are savings and savings leads to investment, investment gets return and then again it may lead to investment is the vicious cycle of investment. All the savers are not investors. Investment is often associated with risk. Return is inherited with risk. The high risk is associated with higher return and low risk is associated with lower return. For instance, The risk in the retailing business is limited and low because every selling is for ready payment. So, in the Business to Consumer basis the return is also limited. The risk in the Wholesale business is higher and unlimited because every transaction is on credit basis. So, in the Business to Business basis the return is higher. Before, making an investment an investor has to analyse thoroughly with the return and risk associated to it.





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ESTRANGEMENT IN UPAMANYU CHATTERJEE'S *ENGLISH, AUGUST: AN  
INDIAN STORY*

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**ABSTRACT**

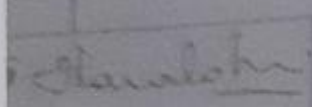
Upamanyu Chatterjee was born in 1959 in Patna. He joined the Indian Administrative service in 1983 and at present works as a civil servant in Bombay. *English, August: An Indian Story* is his debut novel, which was first published in 1988. This novel is a captivating metaphor of contemporary English educated Indian urban youth and his failed quest for self-realization. Through this novel Chatterjee offers a complex view of the post-colonial society in which exile and alienation seem to be an inescapable and inevitable human condition. Agastya Sen is a westernised Indian who feels alienated not only professionally, but even socially and culturally. In Madna he feels a strange sense of desolation, alienation and frustration. Through this novel Chatterjee reflects very sharply on the pathological careerism of modern Indian youth.

**Key words:** alienation, frustration, desolation, pathological, westernised.


Agastya Sen is the protagonist in this novel. He is born of a mixed parentage; his father is a Bengali Hindu and his mother a Goanese Christian. His mother dies from meningitis when Agastya was just three years old, so he has spent his days with his uncle, Pultukaku at Delhi. He is named after a great Hindu sage, Agastya, but he is often asked what kind of name is it?, what does it mean? by others. His parents call him as Ogu. His uncle says "an absurd combination, a boarding-school English literature education and an obscure name from Hindu myth" (129). R.N. Srivastav, the Collector and District Magistrate of Madna, his mentor and boss for the months of training asks "So? Agastya, what kind of name is

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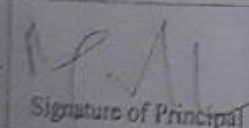
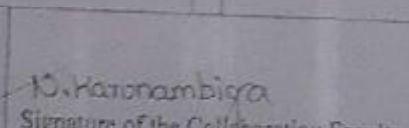
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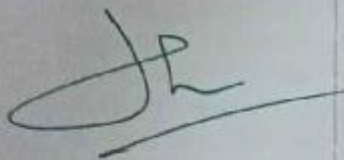




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**ABSTRACT**

Performance appraisal is systematic evaluation of the individual with respect to his or her performance on the job and his or her potential for development. Performance appraisal is a formal, structured system of measuring and evaluating an employee's job, related behavior and outcomes to discover how and why the employee is presently performing on the job and how the employee can perform more effectively in the future so that the employee, Organisation, and society all benefit."

Heyel, "It is the process of evaluating the performance and qualifications of the employees in terms of the requirements of the job for which he is employed, for purposes of administration including placement, selection for promotions, providing financial rewards and other actions which require differential treatment among the members of a group as distinguished from actions affecting all members equally."

Dale Yoder, "Performance appraisal includes all formal procedures used to evaluate personalities and contributions and potentials of group members in a working Organisation. It is a continuous process to secure information necessary for making correct and objective decisions on employees."

Pollitt (2004)'s study asserts that 360 degree feedback helps individuals in many ways such as improving performance, structuring competencies etc. He also states that it is flexible and friendly and is more appreciated than conventional method.

Newbold (2008) says 360 degree appraisals are classics. 360 degree appraisals are a powerful addition to the performance management system. It should be in alignment with the strategic aim of the organization. The author also focuses on the success of the 360 degree feedback. It is a success only because of few factors like the purpose being clear, organization readiness, employee preparation, the way it has to be run, and finally effective delivery of the feedback.

Behn (2000) states that there are two major purposes of conducting performance appraisals. One purpose is to provide information about work performance that is used for administrative decision making. Decisions about salary increases (if the organisation functions with a merit raise system), bonuses, training, promotions, and other administrative actions are generally based on information brought out in a performance appraisal.

Manuel London, Edward M. Mone, John C. Scott (2004) This paper deals with performance appraisal systems in organizations and evaluate how it follows the principles of good management supported by extensive research in organizational psychology and human resource management. This paper mainly focuses on two key elements of performance management systems such as rate accuracy and goal setting.

Michael E. Gordon, Lea P. Stewart (2009) In this paper author describes clearly about dissatisfaction level with performance appraisal methods and it is widespread with no consensus about an outcome of the problem. The AI is a communicative act with situated outcomes, this communication theory will offer to a reassessment of the AI process.

G Meenakshi (2012) This paper focus on internal and external customers which emphasis on different dimensions of performance (leadership, innovation, teamwork, initiative, emotional intelligence, entrepreneurship, etc). This paper will evaluate the performance of any individual based on their skills and often they include examples and evidence to support this information system.





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## 360° DEGREE PERFORMANCE APPRAISAL – LITERATURE REVIEW

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**ABSTRACT**

Performance appraisal is systematic evaluation of the individual with respect to his or her performance on the job and his or her potential for development. Performance appraisal is a formal, structured system of measuring and evaluating an employee's job, related behavior and outcomes to discover how and why the employee is presently performing on the job and how the employee can perform more effectively in the future so that the employee, Organisation, and society all benefit."

Heyel, "It is the process of evaluating the performance and qualifications of the employees in terms of the requirements of the job for which he is employed, for purposes of administration including placement, selection for promotions, providing financial rewards and other actions which require differential treatment among the members of a group as distinguished from actions affecting all members equally."

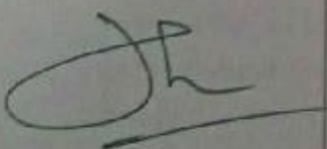
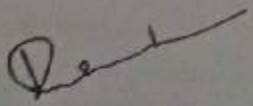

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### 360<sup>0</sup> DEGREE PERFORMANCE APPRAISAL – LITERATURE REVIEW

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#### ABSTRACT

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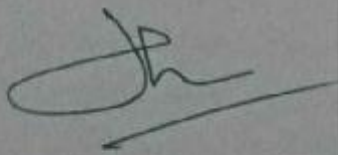
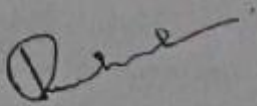

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## A CONCEPTUAL STUDY ON 360 DEGREE PERFORMANCE APPRAISAL

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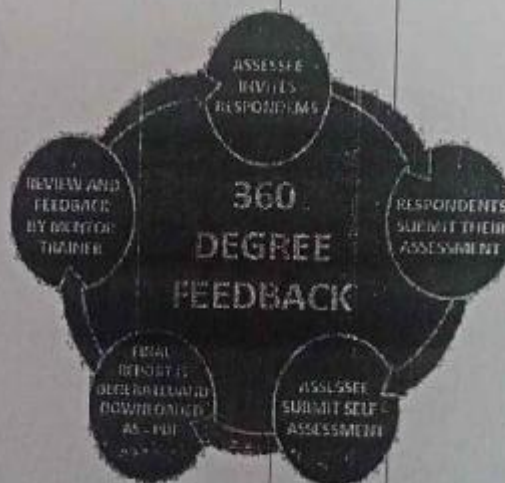
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## ABSTRACT

The 360 degree performance appraisal system is a way to make sure the appraisal is done in a full-fledged way considering all the elements surrounded to the employee. The 360 degree performance appraisal policy is very complicated and difficult to implement. One may ask why organization should invest in 360 degree performance appraisal system? Here the answer, is for long term development of employee and to create a strong leadership front. The 360 degree performance appraisal method provides a holistic approach towards the performance of employee. It includes very important factors such as collaboration, teamwork and leadership. Development plan based on the 360 degree performance appraisal system, effectively improve the overall performance of employee and productivity of organization. There are different steps which we follow in order to implement the 360 degree assessment. Clarity and effectiveness of the system is very important for an organization.

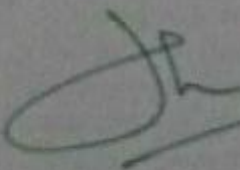
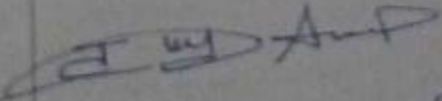
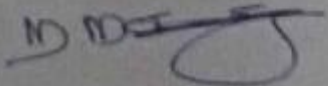
## Introduction to 360 degree performance appraisal?

The 360 degree performance appraisal system is advanced kind of appraisal which is used by many organizations where performance of employee is judged using the review of around 7 to 12 people. These people are working with the employee and they share some of their work environment. The feedback is gathered in the form of reviews in





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## THE CONCEPT OF GREEN MARKETING CHALLENGES AND OPPORTUNITIES FOR SUSTAINABLE DEVELOPMENT

S. JENIFER ANGELEN\*  
 R. SUNITA\*\*  
 Dr. M. MOHAMMED SIDDIK\*\*\*

### ABSTRACT

Green revolutions, going green, environmental protection, sustainable life style, sustainable development, protecting our earth and many more have become a natural phenomenon in our everyday life. Green marketing is a tool used by many companies in various industries to follow this trend. The development of green marketing has opened the door of opportunity for companies to co brand their products into separate line, lauding the green-friendliness of some while ignoring that of others. This paper mainly focuses on the concept, need, importance & strategy of green marketing in India. As society becomes more concerned with the natural environment, businesses have begun to modify their behavior in an attempt to address society's "new" concerns. Some businesses have been quick to accept concepts like environmental management systems and waste minimization, and have integrated environmental issues into all organizational activities. One business area where environmental issues have received a great deal of discussion in the popular and professional press is marketing. Terms like "Green Marketing" and "Environmental Marketing" appear frequently in the popular press. Many governments around the world have become so concerned about green marketing activities that they have attempted to regulate them.

**Keywords :** Green marketing, Sustainability, Environmentally Safe, Recyclable, Eco-Friendly products.

#### Introduction

The term green marketing is often used freely and in the wrong context. The terms like phosphate free, recyclable, refillable, ozone friendly and environmentally friendly are some of the things consumers most often associate with green marketing. But green marketing incorporates a broad range of actions such as the product modification, changes to the production process, packaging changes, as well as modifying advertising which can be applied to consumer goods, industrial goods and even services. According to a recent research, at a world level, the positive fame of a company about its environmental responsibility is determined by the 53% of consumers (about 1 billion) as an important reason that makes them buy and use its products. Unfortunately, a majority of people

believe that green marketing refers only to the endorsement or advertising of products with environmental characteristics. Terms like Phosphate free, Recyclable, Ozone friendly, and environment friendly are some of the things consumers most often associated with green marketing. In general, green marketing is a much broader concept that can be useful to consumer goods, industrial goods and even services. Thus green marketing incorporates a broad range of activities, including product modification, changes to the production process, packaging changes, as well as modifying advertising.

#### WHAT IS GREEN MARKETING :

The marketing or promotion of a product based on its environmental performance or an improvement thereof (Charter & Polonsky 1999).

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**A STUDY ON GREEN MARKETING AND ITS IMPACT ON CONSUMER BUYING BEHAVIOUR IN CHENNAI**

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**Abstract**

Green marketing is going to be proactive topic with it steps into the world of the consumers where consumers are not only aware for the multiple brands and their perceived quality but also they have started to pay more attention to the environment and thereby becoming more eco-friendly. Global warming, pollution and climate change are some of the problems that have become an increasingly concerning issue internationally. Environmental deterioration has led to businesses changing the way in which they conduct themselves, leading to the emergence of green marketing. A considerable amount of research has been conducted on green marketing and consumer behaviour mainly in developed cities in India. There is, however, a noticeable dearth of knowledge pertaining to consumers in Chennai. Thus, the aim of this paper is to examine, at an exploratory level, the influence of green marketing on the purchasing behaviour of Chennai consumers. A survey was conducted on a sample of 100 consumers using a quantitative, exploratory and descriptive design. The results indicate that Chennai consumers have high knowledge levels on the issues facing the environment. Elements of the green marketing mix, specifically, green promotion, were found to raise awareness and encourage positive change in consumption behaviour. A large proportion of respondents preferred to patronize socially responsible retailers. Furthermore, respondents preferred green products over standard alternatives. However, they were price sensitive which affected their purchasing decisions. It emerged that there was no significant difference between low and high income earners in terms of price sensitivity, and no significant difference between lower and higher qualified respondents in terms of knowledge and awareness of environmental degradation and green marketing.

**Keywords:** green marketing, green marketing mix, consumer purchase decisions.

**I. INTRODUCTION**

Green marketing refers to the process of selling products and/or services based on their environmental benefits. Such a product or service may be environmentally friendly in itself or produced and/or packaged in an environmentally friendly way. The obvious assumption of green marketing is that potential consumers will view a product or service's "greenness" as a benefit and base their buying decision accordingly. The not-so-obvious assumption of green marketing is that consumers will be willing to pay more for green products than they would for a less-green comparable alternative product - an assumption that, in my opinion, has not been proven conclusively. While green marketing is growing greatly as increasing numbers of consumers are willing to back their environmental consciousnesses with their dollars, it can be dangerous. The public tends to be skeptical of green claims to begin with and companies can seriously damage their brands and their sales if a green claim is discovered to be false or contradicted by a company's other products or practices. Presenting a product or service as green when it's not is called greenwashing. Simply put, green cleaning is about using products that are safe and healthy for you and the environment and about employing eco-friendly cleaning practices, like reducing water



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## A Study on Performance Appraisal on Performance Intensification

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### Introduction

The effective operation of every organization is an element of the quality and performance of the employees who works in the organization to accomplish its objectives and goals. Development of employee performance in the work place is imperative for the accomplishment of business achievement of each business organization. Employees with competency and quality are therefore the supporting pillars essential for the fulfillment of predestined or new organizational desires. Thus, organizations endeavor routinely using motivated workforce who are competent to improve their performance and to increase upper hand over contenders. Skilled employees are the most important assets in any organization and all things considered, when overseen successfully, can fundamentally add to long term organizational positive results. In the process of Performance appraisal the evaluation of an individual performance is carried out in a systematic manner. Performance is measured against the different variables such as job knowledge, quality, initiative, leadership qualities, output, teamwork, supervision, judgment, flexibility and participation. Organizations set targets and objectives that they progress in the direction of accomplishing. Considering this, management segments of organizations are entrusted to adapt the expertise and techniques in effectively planning, organizing, coordinating, and controlling the tasks to accomplish set targets.

### BACKGROUND OF THE STUDY

Employee performance appraisals have demonstrated viable in enhancing employee and team performance which thus has turned in to organizational upgraded performance. In the present profoundly competitive business environment that demands improved individual and gathering efficiency, a very much planned performance appraisal is a powerful instrument that organizations can depend upon to acknowledge improve employee performance and profitability. It is a successful and key instrument for employee costing and supervision. Organizations that are successful look forward to understand the centrality of incorporating performance appraisals into their performance management procedure and technique. They likewise use it as a device to support, connect with, and build up their talent pool.

### REVIEW OF LITERATURE

Obiekwe, Onyebuchi and Ejo-Orusa, Henry (2019)<sup>1</sup> studied the effect of employee performance appraisal on performance of business organizations. They inferred that the employee performance appraisal is an essential input that prompts the

<sup>1</sup> Obiekwe, Onyebuchi and Ejo-Orusa, Henry (2019) Impact Of Employee Performance Appraisal On Performance Of Business Organizations: A Theoretical Review, EPRA International Journal of Economic and Business Review-Peer Reviewed Journal Volume - 7, Issue- 9, September 2019 [e-ISSN : 2347 - 9671] p- ISSN : 2349 - 0187



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## A CONCEPTUAL STUDY ON 360 DEGREE PERFORMANCE APPRAISAL

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The 360 degree performance appraisal system is a way to make sure the appraisal is done in a full-fledged way considering all the elements surrounded to the employee. The 360 degree performance appraisal policy is very complicated and difficult to implement. One may ask why organization should invest in 360 degree performance appraisal system? Here the answer, is for long term development of employee and to create a strong leadership front. The 360 degree performance appraisal method provides a holistic approach towards the performance of employee. It includes very important factors such as collaboration, teamwork and leadership. Development plan based on the 360 degree performance appraisal system, effectively improve the overall performance of employee and productivity of organization. There are different steps which we follow in order to implement the 360 degree assessment. Clarity and effectiveness of the system is very important for an organization.

**Introduction to 360 degree performance appraisal?**

The 360 degree performance appraisal system is advanced kind of appraisal which is used by many organizations where performance of employee is judged using the review of around 7 to 12 people. These people are working with the employee and they share some of their work environment. The feedback is gathered in the form of reviews in terms of competencies of the employee. The employee himself or herself also takes part in this appraisal with the help of self assessment. The 360 degree performance appraisal system is a way to improve the understanding of strength and weaknesses of employee with the help of creative feedback forms.

There exist 3 prime reasons due to which organization prefer to go for a 360 degree performance appraisal.

1. In order to get a enhance review about performance and prospective of the future leader.
2. To broaden the insight of manpower development and its needs.
3. In order to collect feedback from all the employees and to ensure the organizational justice.

Usually under 360 degree appraisal system the feedback is collected from peers subordinates customers managers and the team members of the employee. The feedback is collected using on job survey based on the performance of employees there exist four stages of a 360 degree appraisal. The first stages self appraisal followed by superior's appraisal then subordinates appraisal and lastly the peer appraisal.

**WHAT IS A 360 PERFORMANCE REVIEW IN HR?**

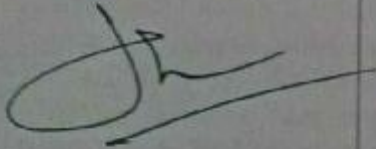
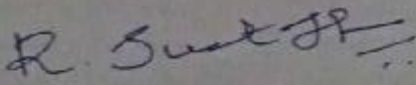

The 360 review is a professional opportunity given to the coworkers to provide 360 degree feedback about the performance of their fellow employee. Traditionally either the HR department or reporting manager of employee asks the subordinates to provide their feedback.



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## RELATIONSHIP BETWEEN CORPORATE SOCIAL RESPONSIBILITY, CORPORATE ETHICS AND CORPORATE GOVERNANCE

R. SUNITA\*  
 Dr. M. MOHAMED SIDDIK\*\*

### ABSTRACT

Corporate Social Responsibility (CSR), Corporate Ethics (CE) and Corporate Governance (CG) are conceptualized by the Western countries, where their practices have developed tremendously in the last decade. The success of modern business is apparent, but recently there is much concern in the business-and-society literature and in the general press on whether business fulfils its social role responsibly. Business ethics, corporate social responsibility and corporate governance movements have been developed in recent decades as responses to a growing sense of corporate wrongdoing. This paper attempts to explain why the three movements seem yet to have generated little in the form of widely accepted prescriptions for improvement of business behavior to the satisfaction of the "constituents" of business, i.e. the major stakeholders. Without denying the usefulness of any of the three movements, the paper suggests that there are weaknesses in all three, especially concerning the way they conceive modern business operation. To this end business pluralism, responsive codes of practice and re-examination of the assumptions (conditions) of business operation could be helpful.

**Keywords :** Business Ethics; Corporate Social Responsibility; Corporate Governance.

#### Introduction

Corporate social responsibility is a topic that has been given increased attention in the last two decades in practice and in theory, both in management and law. Defined in an influential 1970's article as "the firm's considerations of, and response to, issues beyond the economic, technical, and legal requirements of the firm to accomplish social benefits along with the traditional economic gains which the firm seeks," the European Commission more simply defined it in 2011 as "the responsibility of enterprises for their impacts on society." As the Commission stated in adopting that definition, "[e]nterprises should have in place a process to integrate social, environmental, ethical, human rights and consumer concerns into their business operations and core strategy in close collaboration with their stakeholders." Thus, the emphasis has shifted from philanthropy and attention to corporate action "beyond law," to an inquiry into how a company conducts its business. Indicative of

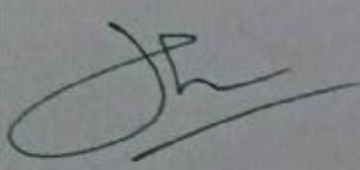
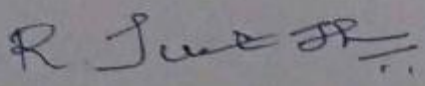
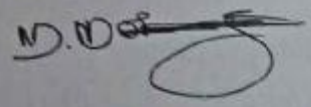
this shift, many academics and practitioners in management now refer to the topic as corporate responsibility, not corporate social responsibility, as will this author.

In the business literature there is a major strand that celebrates business strength and seeks formulae for success. This strand was manifested in the Scientific Management tradition dating from Frederic Taylor's work in the early twentieth century (Taylor, 1911) and continued through the Human Relations studies of Elton Mayo that sought to find growth through taking care of the "people dimension" (Roethlisberger and Dickson, 1939). The tradition was further developed following the publication by Peters and Waterman (1982) of their book *In Search of Excellence*, and by Goldsmith and Clutterbuck (1985) in *The Winning Streak* and by the movement for business process re-engineering (Hammer & Champny, 2001).

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R. Sunita, Dr. M. Mohamed Siddik

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Research Article

## A Comparative study on Non-Performing Assets of Selected Public and Private Sector Banks

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### Abstract:

The Indian banking can be broadly categorized into nationalized (government owned), private banks and specialized banking institution. Today, all the banks are facing the problem of nonperforming assets whether it is public sector bank or private sector bank. The asset quality of banks is one of the most important indicators of their financial health. NPAs affect the liquidity and profitability, in addition to posing threat on quality of asset and survival of banks. The Indian banking sector has been facing serious problems of raising Non Performing Assets (NPAs). The NPA's growth has a direct impact on profitability of banks. The research paper attempts to evaluate various ratios of nonperforming assets and compare the ratios of Public and Private sector banks.

**Keywords:** Non Performing Assets, Gross Non Performing Assets, Net Non Performing Assets, Public Sector Bank, Private Sector Bank.

### Introduction:

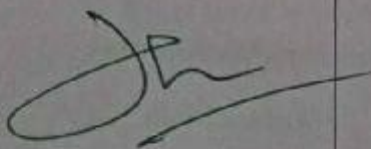
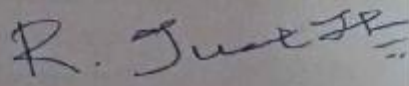
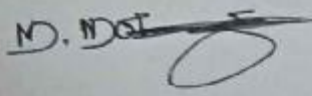
A non-performing asset (NPA) is a classification used by financial institutions for loans and advances on which the principal is past due and on which no interest payments have been made for a period of time. In general, loans become NPAs when they are outstanding for 90 days or more, though some lenders use a shorter window in considering a loan or advance past due.

**Definition of Non Performing Assets :** A non performing asset (NPA) is a loan or advance for which the principal or interest payment remained overdue for a period of 90 days. Non Performing Asset (NPA) refers to an asset, when it ceases to generate income for any bank or finance company for more than 90 days. With effect from 31st March, 2004 a non-performing assets (NPAs) shall be a loan or an advance where:

- i. Interest and / or installment of principal remain overdue for a period of more than 90 days in respect of a term loan,
- ii. The account remains out of order for a period of more than 90 days, in respect of an overdraft/cashcredit.
- iii. The bills remain overdue for a period of more than 90 days in the case of bills



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# LINKAGE BETWEEN CAPITAL STRUCTURES WITH FINANCIAL PERFORMANCES OF AUTOMOBILE INDUSTRY IN INDIA – COMPARATIVE ANALYSIS

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## ABSTRACT

The present study is mainly based on the secondary data and the data is collected from the annual report of Nifty 50 automobile companies and websites of moneycontrol.com, BSE.com etc for the period ended on 31<sup>st</sup> March 2010 to 31<sup>st</sup> March 2019. IGR and SGR under Du Pont analysis were used as modern financial variable instead of other financial variables like operating profit ratio, ROCE etc. (D P Singh 2012), EPS and NAPS (Sundat Ojo 2012), RONW (Shailesh 2013) and RO/ROA (Zhi Tang 2011, Evelyn Setiawan et al 2012). All the parameters have been analyzed with descriptive analysis, Karl Pearson's correlation for its validity. The coefficient of determination has also been tested through linear regression analysis and result of co-efficient of correlation proved that Capital Structure has negative, but significant relationship IGR and SGR at 0.01% levels. EPS, DPS, ROCE, NPM and Asset turnover has positive impact on IGR at 84.24% and EPS, DPS and ROCE have positive impact on SGR at 74.9%. EPS, BVPS, NP Margin and Asset Turnover have significant impact on Capital structure to the extent of 72.8% of selected Nifty 50 automobile companies in India for the study period.

**KEYWORDS:** Internal Growth Rate(IGR), Sustainable Growth Rate (SGR), Capital Structure and Automobile industry

## 1. INTRODUCTION


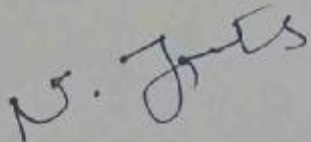

Capital structure refers to the mix of long term Debts and shareholders' funds required for an organization. Capital structure role is important because it affects the financial performance of the company. Financial structure refers to the composition of the entire liabilities of the firm, where as Capital structure is the permanent financing of the firm represented primarily by long term debts and shareholders' funds but excluding all short term credit. Capital structure decision is used to examine, its impact factor on the value of firm. The use of debt in Capital structure leads to finance cost. EBIT – EPS technique analysis is generally applied to determine an appropriate capital structure of the firm.

### 1.1 Capital Structure

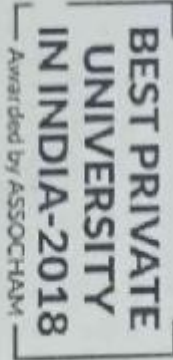
"Capital structure encompasses a corporation's publicly issued securities, private placements, bank debt, trade debt, leasing contracts, tax liabilities, pension liabilities, deferred compensation to management and employees, performance guarantees, product warranties and other contingent liabilities. This list represents the major claims to a corporation's assets. Increase or reduction in any of these claim represent a form of capital structure change." There may be four fundamental patterns of capital structures. They are 1) Equity share capital



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This is certify that **Dr. M. MOHAMED SIDDIK**, Assistant Professor, PG & Research Department of Commerce, Sadakathullah Appa College (Autonomous), Tirunelveli has delivered a lecture as a Resource Person on 02/02/2021 (AN Session) in the title of "Open Broadcasting Software (OBS)" during the Faculty development Programme on "Empowering Teachers with Multi-Dimensional Teaching Skills" organized by the Department of Commerce & IOAC, Periyar Maniammai Institute of Science & Technology (Deemed to be University), Vallam, Thanjavur.

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**Previously unrecorded distribution of marine sediments derived yeast isolates revealed  
by DNA barcoding**

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### Abstract

For the yeast population and diversity, marine habitats are the least explored niches and the lack of validated database is considered to be a drawback for yeast research. The aim of the present study is to create a comprehensive DNA barcode library for marine derived yeast species isolated from organic burial hotspots such as coastal sediment in mangrove and continental shelf ecosystems. As we enriched, isolated and ITS gene sequenced 1017 marine derived yeast isolates belonging to 157 marine species in 55 genera, 28 families, 14 orders, 8 classes of 2 Phyla (*viz.*, Ascomycota and Basidiomycota) of which 13 yeast species were first time barcoded. We witnessed yeast species of both terrestrial and marine endemic origin in the barcode datasets. Due to the large volume of sequencing trace files, the variable length of extracted sequences, and the lack of reference sequences in public databases, difficulties were faced in taxonomic sequence validation. The length of the majority of the sequences (99.42%) were more than or equal to 600 base pairs. BLAST analysis revealed that 13 yeast species were barcoded for the first time. The genus, *Candida* was the speciose genera isolated in this study. K2P intra-species distance analysis performed for selective groups yielded an average of 0.33%, well below the previously proposed yeast barcode gap. ITS gene NJ-tree based identification conducted for selective species in Ascomycota and Basidiomycota, precisely clustered the same species into one group, indicating the efficacy of ITS gene in yeast species delineation. Besides isolating some of the common marine yeast species such as *Candida oceani*, *Bandonia marina* and *Yarrowia lipolytica*, we found approximately 60% of the yeast species isolates were previously unrecorded from the marine environment (example; *Cystobasidiopsis lactophilus*, *Slooffia cresolica*, *Udeniozyma ferulica*, *Colacogloea falcatus* and *Pichia guilliermondii*), of which 16.5% were recognised as potential human pathogens (example; *Candida orthopsilosis*, *C. rugosa*, *Debaryomyces fabryi* and *Yamadazyma triangularis*). Apart from releasing the barcode data in GenBank, provisions were made to access the entire dataset along with meta-data in the Barcode of life database (<http://dx.doi.org/10.5883/DS-MYIC>). This research constitutes the largest dataset to date for collecting marine yeast isolates and their barcodes. As meta- and environmental barcoding analysis were expanding its scope including environmental assessment and monitoring, the datasets such as ours will be more useful.

**Key words:** Marine yeast, DNA barcoding, unrecorded yeasts, yeast pathogens, ITS gene



## 1. Introduction


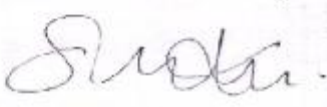

In the tropical and subtropical geographies, mangroves and its associated mycobiota are vital components of the ecologically and economically significant food web (Lee et al., 2014). So far 69-77 mangrove species (including their associates and hybrids) have been documented (Alappatt, 2008; Stazzell-Tallman et al., 2008). The mangroves constitutes 4 Gton of Carbon with global biomass of 8.7 Gton, distributed in 112 countries over 10-24 million hectares (Kathiresan & Bingham, 2001; Giri, 2011). The primary production rate in mangrove ecosystems is equal to the rates in evergreen tropical humid forests (Alongi et al., 2014). On the other hand, in the Bay of Bengal, one of the largest sediment inputs occurs among the world's ocean, receiving 2000 million tons of sediments annually (Mohanty et al., 2008) along with significant amount of terrestrial organic materials (Hedges and Keil, 1995; de Haas et al., 2002) contributed by various rivers including the Kaveri on the southeast coast of India (Khan et al., 2012). Yeast populations have rarely been explored in these sites besides an abundant occurrence of culturable filamentous fungal isolates in these large carbon burial sites (Das et al., 2009; Velmurugan et al., 2013; Godson et al., 2014).

In comparison to aquatic ecosystems, fungi in terrestrial and fresh water environments have been well studied (Gulis et al., 2009; Raja et al., 2018). Through decomposition plant material and nutrient replenishments (Schmidt & Shearer, 2004; Shearer et al., 2007), fungi plays a significant role in the mangrove ecosystems by providing food for fishes and invertebrates (Hogarth, 1999). The unicellular fungi, yeast (Kutzman and Fell, 2015) is a polyphyletic group (Kutty and Philip, 2008), and when requires seawater for its growth was described as marine yeast (Chi, 2012). Marine yeasts are known for their parasitic, mutualistic or saprophytic relationship with marine animals in addition to their significance in nutrient cycling, and may therefore be associated with various marine invertebrates, including crabs, clams, mussels, prawns, oysters or other substrates (Jones and Pang, 2012; de Araujo et al., 1995; Kosawa da Costa et al., 1991; Pagnocca et al., 1989). In two major phyla viz., Ascomycota and Basidiomycota, the diverse marine yeast is largely classified (Kurtzman 2011; Boekhout et al. 2011). Though basidiomycetous yeast species were known for high salt tolerance (Tekolo et al., 2010), most of marine derived Ascomycetous yeast species are of terrestrial origin with widespread phylogenetic diversity (Fell, 2012).

Since its first isolation (Fischer and Brebeck, 1894), which was recently overcome using molecular taxonomy (Fell, 2012), numerous difficulties have existed in marine yeast nomenclature and taxonomy. DNA barcoding has simplified the recognition of biological species using short DNA fragment sequencing and analysis (Hebert et al., 2003). One of the



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### Variability in the diet diversity of catfish highlighted through DNA barcoding

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## Abstract

Identification and quantification of fish diet diversity was the first step in understanding the food web dynamics and ecosystem energetics, where the contribution of DNA barcoding technique has been important. We used DNA barcoding to identify the stomach contents of a curyhaline, benthophagous catfish *Arius maculatus*. From 40 catfish stomach items sampled in two different seasons, we barcoded 67 piscine and macro-invertebrates prey items, identified as belonging to 13 species in 4 major phyla (viz., Chordate, Arthropod, Annelida and Mollusca). It is important to note that the mollusc taxa (*Meritrix meritrix* and *Perna viridis*) and a species of fish (*Stolephorus indicus*) could not be found among the gut contents of *A. maculatus* sampled during the pre- and post-monsoon season, respectively. Among the piscine diets of *A. maculatus*, *Eubleekeria splendens* (23.5%) and *Stolephorus indicus* (23.5%) were the major prey taxa during pre-monsoon season. The hermit crabs forms the major constituents of both pre- and post-monsoon seasons, among invertebrate taxa. Polychaete, *Capitella capitata* (25.92%) was abundantly consumed invertebrates next to hermit crabs. We noticed that in pre-monsoon *A. maculatus* was more piscivorous than post-monsoon. As revealed through Kimura-2 parametric pairwise distance analysis, the diet diversity was relatively higher in post-monsoon. The accumulation curve estimated 57 haplotypes within 14 barcoded species (including the host *A. maculatus*). Majority of haplotypes were found among fishes (47.36%) followed by Arthropods (28.07%), Annelids (14.03%) and Mollusca (10.52%), respectively. This study also highlights that there is a growing concern about *A. maculatus*'s aggressive predation on commercially important stocks of fish and invertebrates. We will continue to expand the coverage of species barcoded in the reference database, which will become more significant as meta- and environmental DNA barcoding techniques become cheaper and prevalent.

**Keywords:** *Arius maculatus*, catfish, Stomach analysis, DNA barcoding, pairwise distance, diet diversity

## 1. Introduction

In Ichthyology, the first step towards identifying trophic levels of the fish species was the determination and quantification of fish stomach contents (Hynes, 1950; Hyslop, 1980; Cresson et al., 2014) and understanding of food web dynamics and energy of the ecosystem

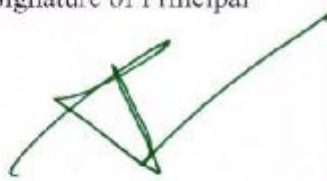

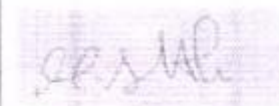


(Beauchamp et al. 2007). The traditional visual survey of stomach content, however, did not provide data to be compared across studies (Cortés, 1997; Hernández, 2019), as level of taxonomic resolution at which a prey was classified (e.g. order, family, genus or species level) and the metrics used for quantification (e.g. count, volume) differed between the studies (Berg, 1979; Hyslop, 1980; Hansson, 1998; Hernández, 2019). While much work has been expended in standardizing dietary analysis (Pinkas, 1971; Cortés, 1997), it has not been universally accepted as a standard technique (Baker et al., 2014). Prey items that is present at different digestive stages when analysing the gut produces ambiguity in taxonomic resolution and identification. These findings differ through studies and rely on different factors, such as the methodology adapted for prey identification, prey condition, prior taxonomic knowledge of the prey species, and the objective of the gut analysis (example: Elliott, 1967; Baker and Sheaves, 2005; Saunders et al., 2012; Gray et al., 2015). In addition to complications due to unreported prey assumption, variable taxonomic resolutions compound the inconsistency and make the findings incomparable between studies.

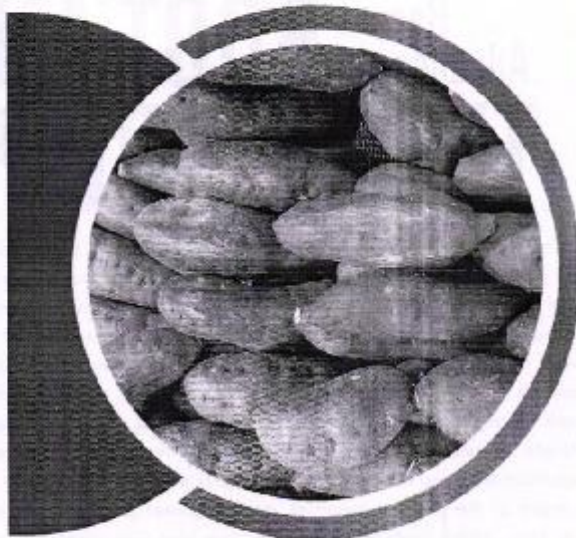
DNA barcoding refers to sequencing the standard barcode region and matching them with archived sequences derived from validated species to facilitate species identification (Hebert et al., 2003; Joly et al., 2014; Kress et al., 2015). DNA barcoding has been used to study trophic dynamics (Valdez-Moreno et al. 2012; Wirta et al. 2014; Moran et al. 2015), environmental forensics (Dalton and Kotze 2011; Handy et al. 2011; Gonçalves et al. 2015), cryptic diversity and invasive species identification (Hebert et al. 2004; Conway et al. 2014; Bariche et al. 2015), ecosystem and evolutionary diversity evaluation (Ward et al. 2005; Baldwin et al. 2011; Weigt et al. 2012a; Leray and Knowlton 2015) and phylogenetic exploration (Nagy et al. 2012; Baeza and Fuentes 2013; Betancur-Ret al. 2013). While a number of markers available (e.g., 16sRNA, 18sRNA, matK, rbcL, ITS), a ~ 650 base pair (bp) region in the mitochondrial cytochrome c oxidase I (COI) gene is one of the most widely used in fish (and other animals) (Ward et al., 2005; Lakra et al., 2010; Khan et al., 2011; Weigt et al. 2012b). Species recognition is made by comparing the query sequence to that of archived sequences in reference databases, such as the Barcode of Life Database (BOLD) (Ratnasingham and Hebert 2007) using the BOLD-Identification System (BOLD-IDs) and in GenBank (National Center for Biotechnology Information) using Basic Local Alignment Sequence Tool (BLAST) (Altschul et al. 1990). DNA barcoding has been widely applied in assessment of diversity and composition of fin and shell fishes (Teodoro et al., 2016; Sharawy et al., 2017; Zhang et al., 2017; Wang et al., 2017; Kuguru et al., 2018; Ran et al., 2020; Xu et al., 2021). DNA barcoding is currently commonly used in consumer markets



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# Recent Advances in ROOT AND TUBER CROPS

Sanket J. More | Namrata Ankush Giri  
Suresh Kumar J. | Visalakshi Chandra C.  
Sirisha Tadigiri



## Recent Advances in ROOT AND TUBER CROPS

More | Giri | Kumar J.  
Chandra C. | Tadigiri

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Root and tuber crops (RTC) were first domesticated several thousand years ago and eventually became a staple food for the poorest farmers and thousands of the tropical and subtropical countries. Currently, RTCs serve as staple food (either primary form or modified form) for more than 2.2 billion population across the globe. RTCs are the third most important food crops after cereals and legumes. Potato along with cassava, sweet potato and yam rank among the top 15 crop plants of the world concerning cropping area. Potato is found in almost every household of the globe. Cassava is the most important root and tuber crop in the tropics where it is a primary staple food in many of the poorest countries, and the sweet potato is also a food staple in Asia, Africa and America. Yams are also important staple food crops in tropical and subtropical regions. Although, taro and Cocoyam are minor crops, they do provide staple food for poor people in Africa, Asia and America. Apart from the food source, RTCs serve as animal feed and fuel source. Conventional breeding methods have succeeded in improving productivity but modern breeding techniques have succeeded in reducing the breeding cycle to some extent. The prepared book also deals with the advanced management aspects of important root and tuber crops: potato (*Solanum tuberosum* L.), sweet potato (*Ipomoea batatas* Lam.), sweet potato (*Ipomoea batatas* Lam.), yam (*Dioscorea esculenta* L.), elephant foot yam (*Xanthosoma indicum* Schott), cocoyam (*Xanthosoma sagittifolium* (L.) Schott) and taro (*Coccoloba esculenta* (L.) Schott). The book will be of value both to students and scientific personnel, as well as to anyone interested in the fascinating group of root and tuber crops. Chapters have been written by experts on the crops with wide knowledge.

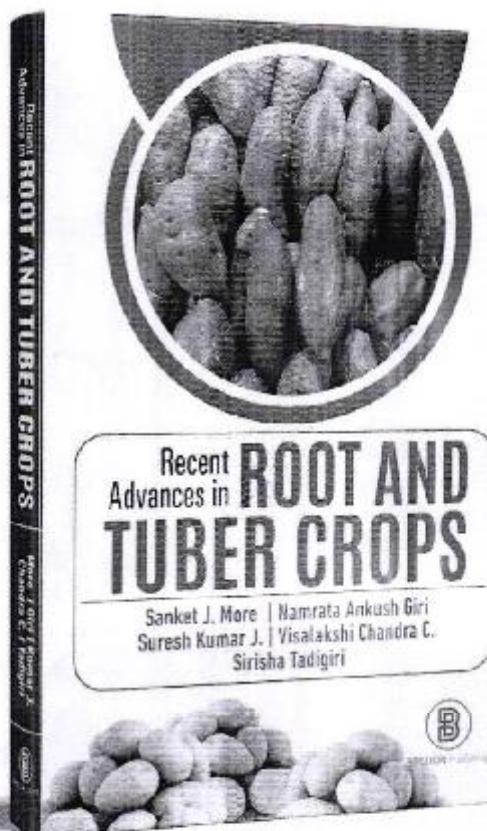


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Sanket J. More | Namrata Ankush Giri  
Suresh Kumar J. | Visalakshi Chandra C. | Sirisha Tadigiri

### (Contents)

- Improved Potato Varieties for Different Agro-Ecologies of India
- Biofortification in Sweet Potato for Health and Nutrition Security
- Targeted Breeding for Processing Traits in Sweet Potato for Varied End Uses
- Postharvest Physiological Coloration (PPC) - Insights and Breeding Potential
- Breeding for Drought Tolerance in Cassava
- Breeding for Drought Tolerance in Sweet Potato (*Ipomoea batatas* L.)
- Recent Advances in Indian Potato Production Technologies
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- Insect Pest of Potato Ecosystem and Their Integrated Management
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03



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# Targeted Breeding for Processing Traits in Sweet Potato for Varied End Uses

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**Visalakshi Chandra, C.<sup>1</sup>, Sheela M.N.<sup>1</sup>, Shirly Raichal Anil<sup>1</sup>, Senthil Alias Sankar<sup>2</sup>**

<sup>1</sup>Division of Crop Improvement, ICAR-Central Tuber Crops Research Institute, Thiruvananthapuram 695 017, Kerala, India.

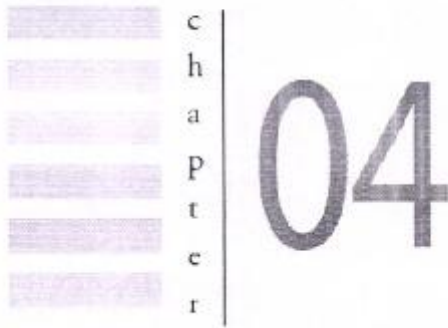
<sup>2</sup>Sadakathullah Appa College, Tirunelveli 627 011, Tamil Nadu, India

Corresponding author: Visalakshi Chandra C.; Email: visalakshi.ctcri@gmail.com

## Abstract

Sweet potato (*Ipomoea batatas* (L.) Lam) belonging to family Convolvulaceae has immense potential to be used for processing considering the high nutritional content and high starch content. Despite this, the potential of sweet potato is still unexplored in many parts of the world except China and Sub Saharan Africa. The availability of extensive genetic variation for important processing traits and high heritability of important quality traits favours the development of varieties suitable for processing. Even though many varieties suitable for processing has been developed in countries like Japan and China, knowledge on gene action and inheritance of certain quality traits and identification of QTLs controlling the same would pave way for improving the status of sweet potato to a modern crop.

**Keywords:** sweet potato, processing, QTL, genetic variation, heritability



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# Postharvest Physiological Deterioration (PPD) - Insights and Breeding Potential

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**Visalakshi Chandra, C.<sup>1</sup>, Sheela, M.N.<sup>1</sup>, Senthil Alias Sankar<sup>2</sup>**

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*Corresponding author: Visalakshi Chandra C.; Email: visalakshi.ctcri@gmail.com*

## Abstract

Postharvest Physiological deterioration is a serious constraint limiting the wide acceptability and utilization of cassava. Cassava roots develop bluish-black discolouration accompanied by foul odour and taste within 2 days of harvest, thereby making it highly unfit for consumption, processing and marketing causing severe economic loss. The deterioration is triggered by damage caused during harvest and proceeds towards storage parenchyma due to several biochemical and enzymatic changes synonymous to programmed cell death. The deterioration occurs in two stages namely primary or physiological deterioration and secondary or microbial deterioration. Both pre-harvest and post-harvest strategies have been proposed to overcome the deterioration although utilization of the genetic potential of resistant varieties is the best alternative considering the cost-effectiveness and ease in applicability.



## Introduction

Cassava (*Manihot esculenta* Crantz) of Euphorbiaceae is one of the major tuber crops grown for consumption, processing and marketing. It is indispensable for food security in African countries and Nigeria is the largest producer of cassava (FAOSTAT, 2018). The roots are used for starch production, as animal feed and have wide industrial applications thereby generating income for small and marginal farmers. Cassava has grown from the status of “food for the poor” to a multipurpose crop suitable for the urbanised world. Cassava is a rich source of dietary energy. Its energy yield per hectare is often very high much higher than that of cereals (FAO, 1997). Also, the roots contain significant amounts of vitamin C, thiamine, riboflavin and niacin. Cassava sustains reasonable yields even under sub-optimal and across all agro-ecological regions thereby qualifying as food security as well as climate-resilient crop. The production advantages of cassava are, however, offset by several biotic and abiotic stresses of which the rapid deterioration of tubers after harvest is the major one challenging the effective and prolonged utilization of the starchy tubers.

## Postharvest physiological deterioration (PPD)

Despite its economic importance, the cassava roots have an endogenous disorder known as postharvest physiological deterioration (PPD) (More et al. 2019) which is reported to cause an economic loss of up to 30% (Naziri et al. 2014). PPD is an endogenous disorder where cassava roots develop bluish-black discoloration accompanied with foul odour and taste within 2 days of harvest, thereby making it highly unfit for consumption, processing and marketing causing severe economic loss (Sanchez et al. 2006). Consequently, the roots must be consumed immediately after harvest limiting its marketing to sites close to production sites. The blue/black or brown discoloration of the vascular parenchyma starts to appear within 24–72 h of harvest and spreads from these to the storage parenchyma.

## PPD-Current understanding

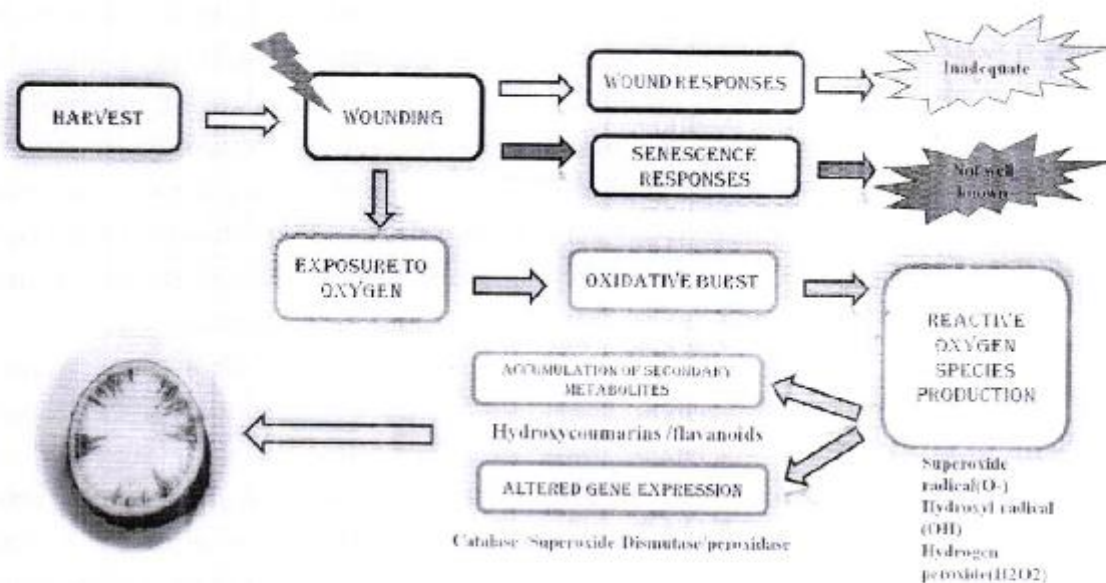




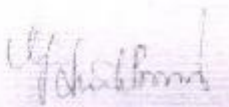
Fig. 1. Current understanding of events related to PPD phenomenon

The studies on PPD initiation reported that in response to wounding/damage during harvest, biochemical changes such as accumulation of fluorescent compounds and secondary metabolites (Buschmann et al. 2000a,b) (Fig. 1), alteration of starch: sugar ratio (Osunsami et al. 1989; Van Oirschot et al. 2000; Sánchez et al. 2013), cell respiration acceleration and enzymatic regulation (Zidenga et al. 2012; Xu et al. 2013), water loss leading to increase in dry matter (Wenham, 1995; Chávez et al., 2005) and oxidative burst (Reilly et al. 2004) occur in cassava roots. Other early events reported to occur in cassava roots are elevation of ethene levels (Plumbley et al. 1981; Hirose et al. 1984), volatile metabolites (Iyer et al. 2010) and calcium ( $\text{Ca}^{2+}$ ) ions increase. PPD induction is also envisioned as a result of cross-talk between calcium signalling, ROS, and programmed cell death (PCD) (Djabou et al. 2017). During PPD symptom progression, the cascade of events including the occurrence of colourless occlusions (Rickard and Gahan, 1983), synthesis of four hydroxycoumarins namely esculin, esculetin, scopolin, and scopoletin (Tanaka et al. 1984; Taniguchi et al. 1984; Buschmann et al. 2000a), accumulation of steroids and diterpenoids (Sakai and Nakagawa, 1988), decrease in phenolics and carotenoids with the increase in flavonoids and anthocyanins (Uarrotta et al. 2014), decrease in phospholipids and glyceroglycolipids and an increase in sterol-containing lipids (Lalaguna and Agudo, 1989) occurs leading to discolouration and deterioration of the roots. Altered regulation of several genes coding for proteins involved in signal transduction, ROS modulation, phytohormone synthesis, phenylpropanoid metabolism, ethene biosynthesis,





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Assistant Professor and Head (PG)

Ref: ZH/Ph.D./Marivignesh/Doc.Com.Met/01/2019

To

**Dr.R. Janet Rani**  
Assistant Professor and Head  
Department of Microbiology  
Sadakathullah Appa College (Autonomous)  
Rahmath nagar, Tirunelveli-627 011

Dear Sir,

Sub: Request to conduct Doctoral Committee Meeting for Mr.R.Marivignesh  
(Reg. No.19111192201006) -reg.

Proposed Title: **Studies on Endophytic Microorganism on the Growth of Indian  
Major Carp**

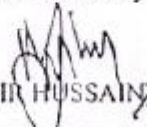
Warm Greetings from PG and Research Department of Zoology

We would like to conduct the first doctoral committee meeting of Mr.R.MARIVIGNESH  
(Reg. No. 19111192201006) on 08-01-2019 at 2.00am in the PG and Research Department of  
Zoology, Sadakathullah Appa College, Tirunelveli. I request you to kindly make your convenient  
to attend the meeting.

Thanking you,

Yours Sincerely,

Place : Tirunelveli  
Date : 08-01-2019

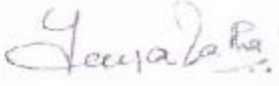
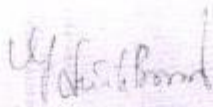
  
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ATTENDANCE CERTIFICATE

This is to certify that **Dr.R. Janet Rani**, Assistant Professor, Department of Microbiology, Sadakathullah Appa College ( Autonomous ), Tirunelveli has attended the meeting of Board of Studies in U.G & P.G. Microbiology held on 05.03.2021. at the University Buildings Tirunelveli.

Date : 05.03.2021  
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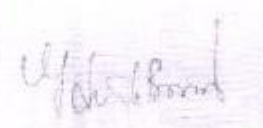


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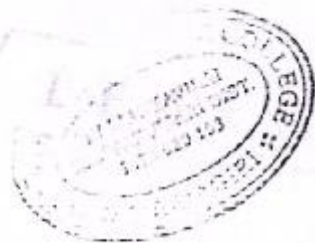
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This is to certify that **Dr. R. Janet Rani**, Head and Asst. Professor in Microbiology, Sadakathullah Appa College, Tirunelveli, had served as member for the first Doctoral committee meeting of Mrs. Andrewsln Jani. V (Reg. No: 19123082272001), Ph.D Part time Internal Scholar in Microbiology, Manonmaniam Sundaranar University, Thirunelveli; on 05.01.2019 at 11.00am in the Inter Disciplinary Research center, Department of Biotechnology, Malankara Catholic College, Mariagiri.



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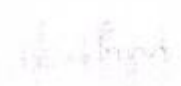
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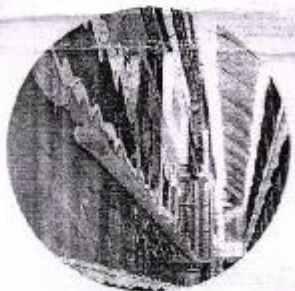
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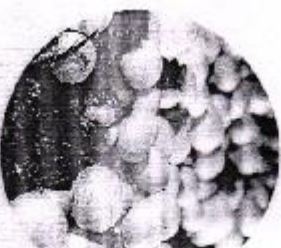
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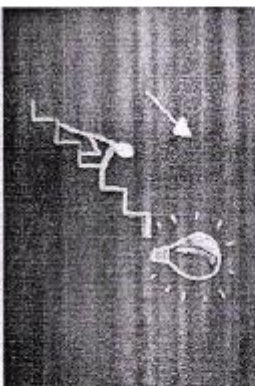
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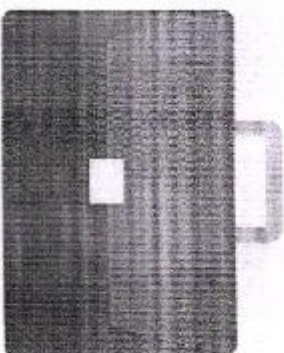
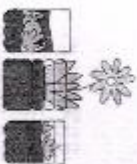
kabilan@klu.ac.in





The workshop aims to create an awareness among the life science students about the ecosystem of bio-entrepreneurship. It also focuses on various funding opportunities, grants, IPR process and bio-incubator facilities available to support budding entrepreneurs and start-ups. Introduction to various successful startups such as Spirulina cultivation, Mushroom cultivation, Biofertilizer production and Organic farming / garden aiming to help students to put their idea into action.

**ABOUT THE WORKSHOP**



**SPEAKERS AND TOPICS**



**Dr. John J. Thambrajah**  
Associate Professor  
Faculty of Business and Management  
Ainara University, Malaysia  
on  
**Bio Entrepreneurship - Converting Life Science Idea into A Venture**



**Mr. S. Gowtham**  
Marketing Manager  
IPR-SOL Life Technologies, PELLID  
on  
**'Sustainable and Holistic Business Ideation'**



**Mr. Kishoth Madhu**  
Patent Attorney  
Aditya Biotech Private  
New Delhi  
on  
**'Basics of IPR - Understanding and Awareness'**



**Dr. N. Jayakumar**  
Chief Educator  
Kanniyakumari Government Arts College  
Kanniyakumari  
on  
**Marketing, Medical, and Agri-Business - Artificial Intelligence and Commercialization**



**Dr. Manivannan Govindasamy**  
Assistant Professor  
New S.S. Velupillai Prasad College  
Madurai  
on  
**Spirulina Cultivation Technology**



**Mr. Nithyakumaran**  
Managing Director  
Sri Groups of Gardening  
and Consultancy  
on  
**'GREENNY OT - A Brief Insight in Rooftop Gardening'**



**Dr. C. Sivanji Kirubagari Aneeshia**  
Assistant Professor & Vice Principal  
St. Mary's College, Theotokubudhi  
on



**Dr. R. Janet Rani**  
Assistant Professor & IOD  
Sadakathulrah Appa College  
Tirunelveli






**Mr. Arif Ali & Mr. Tarik Ali**  
Directors, Eastern Bio-Tech  
Solutions Pvt. Ltd.  
Madhurai, Assam





**Sadakathullah Appa College (Autonomous)**  
Rahmath Nagar, Tirunelveli - 627011

1	Name of the Faculty with Designation, Staff ID	:	<u>Dr. K. Hema</u> Assistant Prof. of English Staff ID : ATEN04
2	Name of the Collaborating Faculty with Designation	:	<u>Dr. S. Viji</u> Assistant Prof. of English
3	Name of the Collaborating Organization	:	Sri Sarada College, Tirunelveli
4	Nature of Collaboration (Academic / Research / Faculty Exchange / Student Exchange / Project / Internship / On-the Job Training)	:	Research
5	Nature / Details of Outcome (Guest Lecture / DC member / Co-guide / Project Reports / Other Reports/Publications)	:	<u>Publication</u> 'Female Distinctiveness in Terry Mcmillan's 'Who asked You'
6	Period of Collaboration	:	From : 14.3.2017 To: 31.1.2022
7	Financial Involvement (if any)	:	—
8	Proof Attached	:	Yes / No
 Signature of Principal		 Signature of the Collaborating Faculty	
		 Signature of the Faculty	



**FEMALE DISTINCTIVENESS IN TERRY MCMILLAN'S *WHO ASKED YOU*****Mrs. Viji. S**

Ph.D.Reg.No.12542, Assistant Professor of English

Sri Sarada College for Women, Tirunelveli, Tamil Nadu, India.

Affiliated to Manonmaniam Sundaranar University Abishekapatti,

Tirunelveli-627012, Tamil Nadu, India.

**Dr. K. Hema**

Research Supervisor and Assistant Professor of English

SadakathullahAppa College, Tirunelveli, Tamil Nadu, India.

Affiliated to Manonmaniam Sundaranar University Abishekapatti,

Tirunelveli-627012, Tamil Nadu, India.

**Abstract**

The emergence of Black Women writers is the platform for investigating and examining female identity and experiences along with the issues related to gender roles. These women-writers prefer writing about their experiences and the society instead of supporting male domination. In the contemporary genre of fiction, Terry McMillan has a stable place for herself as a leading writer of novels. Her main aim is to delineate the issues of black women from metropolitan surroundings. Her speciality is to elect distinctive form and essence for her novels. She differs from other black writers in spotlighting her exclusive point of view in her novels. She wants to depict the issues of women in a practical and constructive way. In her novels, McMillan presents her female characters as bold, intelligent and through them she discloses the flexibility of the black women. The main focus of McMillan's novel is to hypothesize the entangled problems of African American relationships and her novels are extremely fortunate for they depict the inner-city occurrences of African American women with men. Her interesting stories, attractive characters and the happy ending for her fictions are the major contribution to the present popular literature. Though she portrays her protagonists as sufferers, McMillan is very particular in giving fruitful ending for her female characters through their efficiency to tackle their problems and face the challenges in the society. This paper inspects the problems of the protagonist Betty Jean as a mother and a grandmother in providing a positive future for her children and grandsons.

Key words: flexibility, sufferers, tackle, struggle, grandmother.

PANDEMIC DISEASES AND DISORDERS IN LITERATURE



**Sadakathullah Appa College (Autonomous)**  
Rahmath Nagar, Tirunelveli - 627011

1	Name of the Faculty with Designation, Staff ID	:	Dr. K. Hema, Assistant Prof. of English, Staff ID : ATEN04
2	Name of the Collaborating Faculty with Designation	:	Dr. K. Shanmuga Sundar Raj Assistant Prof. of English Government Arts & Science College
3	Name of the Collaborating Organization	:	Kovilpatti. Government Arts & Science College.
4	Nature of Collaboration (Academic / Research / Faculty Exchange / Student Exchange / Project / Internship / On-the Job Training)	:	Co-guide (Research)
5	Nature / Details of Outcome (Guest Lecture / DC member / Co-guide / Project Reports / Other Reports/Publications)	:	Co-guide (1 scholar)
6	Period of Collaboration	:	From : August 2017 To: till date
7	Financial Involvement (if any)	:	—
8	Proof Attached	:	Yes / No ✓
Signature of Principal		Signature of the Collaborating Faculty	
		Signature of the Faculty	





MANONMANIAM SUNDARANAR UNIVERSITY  
CENTRE FOR RESEARCH  
ABISHEKAPATTI, TIRUNELVELI - 627 012, TAMILNADU, INDIA



**DR. K. SENTHAMARAI KANNAN**  
**DIRECTOR**

REF : MSU/RES/R1/JUNE2017

Date : August 10, 2017

**Ph.D., Programme Commencement Order**

To

SUMATHY M  
48A, Sudalaimadan Koil Street, Tirunelveli Town  
Tamil Nadu, Thirunelveli, Pincode - 627006  
Mobile No. : 9952485854, Email ID : msg2suma@gmail.com

Sir/Madam,

Sub: Registration for doing Ph.D., programme - Date of Commencement of Research work -  
Intimation - Reg

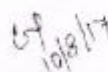
Ref: Counseling attended by the candidate.

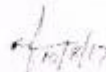
\*\*\*\*\*

With reference to the above, you are provisionally registered for Ph.D., Programme as detailed below :

1. Name of the Scholar : SUMATHY M
2. Registration No. : 17211194012008
3. Discipline : English
4. Gender : Female
5. Social Category (Community) : OC
6. Nationality : Indian
7. PWD Status : Not Applicable
8. Admission Based On : M.Phil
9. Name of the Supervisor : DR K SHANMUGA SUNDARA RAJ
10. Name of the Co-Supervisor : Dr K HEMA
11. Mode : FULL TIME
12. Research Centre : Sadakathullah Appa College, Tirunelveli.
13. Date of Commencement : 10.08.2017
14. Proposed Title : SLAVERY, CRUELTY, AND THE RISE OF HUMANITARIANISM IN SLAVE NARRATTIVES
15. Doctoral Committee Members Details :
  1. DR KANNA MUTHIAH  
Assistant Professor & Research Head, Department of English,  
Sadakathullah Appa College, Tirunelveli  
Mobile No. : 9629245342, Email ID :  
kanna25naga@yahoo.co.in
  2. DR R JEYASUNDARAJ  
Associate Professor, Department of English, St. John's College,  
Tirunelveli  
Mobile No. : 9994192446, Email ID :  
rajayasundar@gmail.com

  
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10/08/17  
DIRECTOR



MANONMANIAM SUNDARANAR UNIVERSITY  
CENTRE FOR RESEARCH  
ABISHEKAPATTI, TIRUNELVELI - 627 012, TAMILNADU, INDIA



**DR. K. SENTHAMARAI KANNAN**  
**DIRECTOR**

Copy to :

<b>Guide :</b> DR K SHANMUGA SUNDARA RAJ Assistant Professor Department of English Government Arts and Science College, Kovilpatti Tamil Nadu Thoothukudi, Pincode - 628503 Mobile No. : 8903426664 Email ID : drckssraj@gmail.com	<b>Co-Guide :</b> Dr K HEMA Assistant Professor Department of English Sadakathullah Appa College Tamil Nadu, Thirunelveli Pincode - 627011 Mobile No. : 9486379448 Email ID : hemaselvan11@gmail.com
<b>DC Member 1 :</b> DR KANNA MUTHIAH Assistant Professor & Research Head, Department of English, Sadakathullah Appa College, Tirunelveli	<b>DC Member 2 :</b> DR R JEYASUNDARA Associate Professor, Department of English, St. John's College, Tirunelveli
<b>The Principal, Sadakathullah Appa College, Tirunelveli.</b>	

**Instructions**

- All communication (letter) to this University should be forwarded by Supervisor / Co-Supervisor (wherever applicable)
- Candidates with M.Phil., qualification should earn 8 credits in the following options: 2 course works of 4 credits each (or) one course work of 4 credits and 1 mini project of 4 credits
- Research Centre Fee of Rs. 2400/- (per annum) to be paid to the Research Centre
- Fee of Rs. 5000/- for every sitting of Doctoral Committee meeting should be paid to the University before the conduct of every meeting
- TA / DA payable to the Doctoral Committee member by the Scholar/Supervisor/Co-Supervisor is to and fro II AC Railway fare and sitting fee of Rs. 500/- and refreshment / contingency cost of Rs.500/- (Bills to be submitted) which will be reimbursed on submission of bills.
- You should pay the Research fee of Rs. 12000 /- per annum on or before June 30th of every year till the submission of thesis to the University through Demand Draft drawn in favour of "The Registrar Manonmaniam Sundaranar University", payable at Tirunelveli issued by any nationalised bank or through challan in Indian Bank. M.S University branch or through challan in state bank of India, Power Jothi account to MSU A/c 32723606944.
- For full-time scholars with M.Phil. qualification minimum period of the programme is 2 years and for PG holders 3 years.
- For part-time scholars with M.Phil. qualification minimum period is 3 years and for PG holders 4 years. The maximum period for all scholars is 6 years.
- It is also informed that the entire duration of the Ph.D., Research work is governed by the Ph.D., Regulations of 01.07.2016.
- For Details of functions of Doctoral Committee refer revised Ph.D., Research Guidelines w.e.f 01.07.2016 under the Head Doctoral committee(1.7)

Phone : 0462 - 2333741, 2338721, 9487996692, 9487907000, FAX: 2322973, Website : msuniv.ac.in





**Sadakathullah Appa College (Autonomous)**  
Rahmath Nagar, Tirunelveli - 627011

1	Name of the Faculty with Designation, Staff ID	:	Dr. K. Hema, Assistant Prof. of English, Staff ID : ATENO4
2	Name of the Collaborating Faculty with Designation	:	Dr. D. Nalina Paulin Assistant Prof. of English,
3	Name of the Collaborating Organization	:	St. John's College, Palayamkottai, Tirunelveli
4	Nature of Collaboration (Academic / Research / Faculty Exchange / Student Exchange / Project / Internship / On-the Job Training)	:	Research
5	Nature / Details of Outcome (Guest Lecture / DC member / Co-guide / Project Reports / Other Reports/Publications)	:	DC Member (1 scholar)
6	Period of Collaboration	:	From : 07.02.2018 To: fill date
7	Financial Involvement (if any)	:	—
8	Proof Attached	:	Yes / No
Signature of Principal		Signature of the Collaborating Faculty	
Signature of the Faculty		Signature of the Faculty	



**DR. K. SENTHAMARAI KANNAN**  
**DIRECTOR**

REF : MSU/RES/R1/JANUARY2018

Date : January 10, 2018

**Ph.D., Programme Commencement Order**

To

SYED ALI FATHIMA R  
32 PERINBAM STREET, SAMADHANAPURAM  
PALAYAMKOTTAI  
Tamil Nadu, Thirunelveli, Pincode - 627002  
Mobile No. : 8754301141, Email ID : amihtafas@gmail.com

Sir/Madam,

Sub: Registration for doing Ph.D., programme - Date of Commencement of Research work -  
Intimation - Reg

Ref: Counseling attended by the candidate.

\*\*\*\*\*

With reference to the above, you are provisionally registered for Ph.D., Programme as detailed below :

- |   |  |
|---|--|
| 1. Name of the Scholar                    | : SYED ALI FATHIMA R   |
| 2. Registration No.                       | : 18121274012013   |
| 3. Discipline                             | : English  |
| 4. Gender                                 | : Female   |
| 5. Social Category (Community)            | : BCM  |
| 6. Nationality                            | : INDIAN   |
| 7. PWD Status                             | : Not Applicable   |
| 8. Admission Based On                     | : PG   |
| 9. Name of the Supervisor                 | : Dr.D.Nalina Palin  |
| 10. Name of the Co-Supervisor             | : NIL  |
| 11. Mode                                  | : PART TIME INTERNAL   |
| 12. Research Centre                       | : St. John's College, Palayamkottai  |
| 13. Date of Commencement                  | : 10.01.2018   |
| 14. Proposed Title                        | : RESISTANCE TOWARDS IDEOLOGICAL CONSTRUCTION OF<br>IDENTITY AND DYSTOPIAN STATE OF POWER : A POST-COLONIAL<br>READING OF THE HUNGER GAMES AND DIVERGENT   |
| 15. Doctoral Committee<br>Members Details | : 1. B BENESON THILAGAR CHRISTADOSS<br>ASSOCIATE PROFESSOR / ENGLISH , ST. JOHNS COLLEGE,<br>PALAYAMKOTTAI-627002<br>Mobile No. : 9366700261, Email ID :<br>godisgood1968@gmail.com<br>2. K HEMA<br>ASSISTANT PROFESSOR / ENGLISH, SADAKATHULLA APPA<br>COLLEGE, TIRUNELVELI-627011<br>Mobile No. : 9486379448, Email ID :<br>hemaselvan11@gmail.com |

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**DR. K. SENTHAMARAI KANNAN**  
**DIRECTOR**

Copy to :

<b>Guide :</b> Dr.D.Naline Palli ASSOCIATE PROFESSOR, DEPARTMENT OF ENGLISH ST JOHNS COLLEGE Tamil Nadu Thirunelveli, Pincode - 627002 Mobile No. : 9944217195 Email ID : nalinearulraj@gmail.com	<b>Co-Guide :</b> NIL
<b>DC Member 1 :</b> B BENESON THILAGAR CHRISTADOSS ASSOCIATE PROFESSOR / ENGLISH , ST. JOHNS COLLEGE, PALAYAMKOTTAI-627002	<b>DC Member 2 :</b> K HEMA ASSISTANT PROFESSOR / ENGLISH, SADAKATHULLA APPA COLLEGE, TIRUNELVELI-627011
<b>The Principal, St. John's College, Palayamkottai</b>	

#### Instructions

- All communication (letter) to this University should be forwarded by Supervisor / Co-Supervisor (wherever applicable)
- Candidates with PG qualification should earn 16 credits in the following option. 4 course works of 4 credits each (or) 3 course works of 4 credits each and 1 mini project of 4 credits
- Research Centre Fee of Rs. 3000/- (per annum) to be paid to the Research Centre
- Fee of Rs. 5000/- for every sitting of Doctoral Committee meeting should be paid to the University before the conduct of every meeting
- TA / DA payable to the Doctoral Committee member by the Scholar/Supervisor/Co-Supervisor is to and fro II AC Railway fare and sitting fee of Rs. 500/- (Bills to be submitted) which will be reimbursed on submission of bills.
- You should pay the Research fee of Rs. 11000 /- per annum on or before January 31st of every year till the submission of thesis to the University through Demand Draft drawn in favour of "The Registrar Manonmaniam Sundaranar University", payable at Tirunelveli issued by any nationalised bank or through challan in Indian Bank, M.S University branch or through challan in state bank of India, Power Jothi account to MSU A/c: 6596950914.
- For full-time scholars with M.Phil. qualification minimum period of the programme is 2 years and for PG holders 3 years.
- For part-time scholars with M.Phil. qualification minimum period is 3 years and for PG holders 4 years. The maximum period for all scholars is 6 years.
- It is also informed that the entire duration of the Ph.D., Research work is governed by the Ph.D., Regulations of 01.07.2016.
- For Details of functions of Doctoral Committee refer revised Ph.D., Research Guidelines w.e.f. 01.07.2016 under the Head Doctoral committee(1.7)
- First Doctoral Committee meeting should be convened within two week from the date of Registration.



**Sadakathullah Appa College (Autonomous)**  
Rahmath Nagar, Tirunelveli - 627011

1	Name of the Faculty with Designation, Staff ID	:	<u>Dr. K. Iema</u> Assistant Prof. of English Staff ID: ATEND4
2	Name of the Collaborating Faculty with Designation	:	<u>Dr. P. Premalatha</u> Associate Prof. of English
3	Name of the Collaborating Organization	:	Kumara Guru Swamikal Arts & Science College Srivaikundam, Tirunelveli
4	Nature of Collaboration (Academic / Research / Faculty Exchange / Student Exchange / Project / Internship / On-the Job Training)	:	Research
5	Nature / Details of Outcome (Guest Lecture / DC member / Co-guide / Project Reports / Other Reports/Publications)	:	DC Member for (2 scholars) Geo Pragatha. E Reg. No: 172240140126
6	Period of Collaboration	:	From: 10.8.2017 To: till date
7	Financial Involvement (if any)	:	—
8	Proof Attached	:	Yes/No
Signature of Principal		Signature of the Collaborating Faculty <u>Dr. P. Premalatha</u> HEAD & ASSOCIATE PROFESSOR DEPARTMENT OF ENGLISH SRI KGS ARTS COLLEGE SRIVAIKUNTAM.	
		Signature of the Faculty <u>Iema</u> 04/02/2022	





**DR. K. SENTHAMARAI KANNAN**  
**DIRECTOR**

REF : MSU/RES/R1/JUNE2017

Date : August 10, 2017

**Ph.D., Programme Commencement Order**

To

GEO PRAGATHA E  
14-2-25 St Antonys Church Street, Agarakattu  
Kadayanallur Taluk  
Tamil Nadu, Thirunelveli, Pincode - 627852  
Mobile No. : 9360616216, Email ID : remijoe27@gmail.com

Sir/Madam,


Sub: Registration for doing Ph.D., programme - Date of Commencement of Research work -  
Intimation - Reg

Ref: Counseling attended by the candidate.

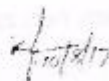
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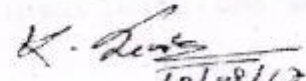
With reference to the above, you are provisionally registered for Ph.D., Programme as detailed below :

- |   |   |
|---|---|
| 1. Name of the Scholar                    | : GEO PRAGATHA E  |
| 2. Registration No.                       | : 17224014012126  |
| 3. Discipline                             | : English   |
| 4. Gender                                 | : Female  |
| 5. Social Category (Community)            | : BC  |
| 6. Nationality                            | : INDIAN  |
| 7. PWD Status                             | : Not Applicable  |
| 8. Admission Based On                     | : PG  |
| 9. Name of the Supervisor                 | : DR P PREMLATHA  |
| 10. Name of the Co-Supervisor             | : DR R VASUHI   |
| 11. Mode                                  | : PART TIME INTERNAL  |
| 12. Research Centre                       | : Manonmaniam Sundaranar University, Tirunelveli.   |
| 13. Date of Commencement                  | : 10.08.2017  |
| 14. Proposed Title                        | : RELIGION AND LITERATURE: THE THEME OF TAGORE'S GITANJALI<br>AS THE REVELATION OF THE RELATION OF LOVE BETWEEN THE<br>ABSOLUTE AND THE INDIVIDUAL SELF   |
| 15. Doctoral Committee<br>Members Details | : 1. DR SELVI<br>Associate Professor, Department of English, S.T.C,<br>Palayamkottai.<br>Mobile No. : 9443378738, Email ID : selviarum09@yahoo.com<br>2. DR K HEMA<br>Assistant Professor, Department of English, Sadakathullah<br>Appa College, Tirunelveli<br>Mobile No. : 9486379448, Email ID :<br>hemaselvan11@gmail.com |

  
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AR

  
10/08/17  
DIRECTOR



**DR. K. SENTHAMARAI KANNAN**  
**DIRECTOR**

Copy to :

<b>Guide :</b> DR P PREMLATHA Associate Professor Department of English Sri KGS Arts College, Srivaikuntam Tamil Nadu Thoothukudi, Pincode - 628619 Mobile No. : 9486777704 Email ID : premlathia68@gmail.com	<b>Co-Guide :</b> DR R VASUHI Assistant Professor Department of English Manonmaniam Sundaranar University Tamil Nadu, Thirunelveli Pincode - 627012 Mobile No. : 8870019491 Email ID : rvasuhi@gmail.com
<b>DC Member 1 :</b> DR SELVI Associate Professor, Department of English, S.T.C, Palayamkottai.	<b>DC Member 2 :</b> DR K HEMA Assistant Professor, Department of English, Sadakathullah Appa College, Tirunelveli
<b>Head of Department, English</b>	

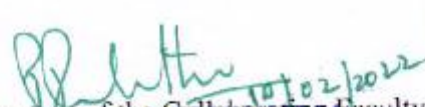
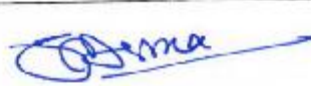
### Instructions

- I D C - 21/12/2017
- All communication (letter) to this University should be forwarded by Supervisor / Co-Supervisor (wherever applicable)
  - Candidates with PG qualification should earn 16 credits in the following option. 4 course works of 4 credits each (or) 3 course works of 4 credits each and 1 mini project of 4 credits
  - Fee of Rs. 5000/- for every sitting of Doctoral Committee meeting should be paid to the University before the conduct of every meeting
  - TA / DA payable to the Doctoral Committee member by the Scholar/Supervisor/Co-Supervisor is to and fro II AC Railway fare and sitting fee of Rs. 500/- and refreshment / contingency cost of Rs.500/- (Bills to be submitted) which will be reimbursed on submission of bills.
  - You should pay the Research fee of Rs. 14000 /- per annum on or before June 30th of every year till the submission of thesis to the University through Demand Draft drawn in favour of "The Registrar Manonmaniam Sundaranar University", payable at Tirunelveli issued by any nationalised bank or through challan in Indian Bank, M.S University branch or through challan in state bank of India, Power Jothi account to MSU A/c 32723605944.
  - For full-time scholars with M.Phil. qualification minimum period of the programme is 2 years and for PG holders 3 years.
  - For part-time scholars with M.Phil. qualification minimum period is 3 years and for PG holders 4 years. The maximum period for all scholars is 6 years.
  - It is also informed that the entire duration of the Ph.D., Research work is governed by the Ph.D., Regulations of 01.07.2016.
  - For Details of functions of Doctoral Committee refer revised Ph.D., Research Guidelines w.e.f 01.07.2016 under the Head Doctoral committee(1.7)





**Sadakathullah Appa College (Autonomous)**  
Rahmath Nagar, Tirunelveli - 627011

1	Name of the Faculty with Designation, Staff ID	:	<u>Dr. K. Hema</u> Assistant Prof. of English Staff ID: ATEN04
2	Name of the Collaborating Faculty with Designation	:	<u>Dr. P. Premalatha</u> Associate Prof. of English
3	Name of the Collaborating Organization	:	Kumara Guru Swamikal Arts & Science College, Srivaikundam, Tirunelveli.
4	Nature of Collaboration (Academic / Research / Faculty Exchange / Student Exchange / Project / Internship / On-the Job Training)	:	Research
5	Nature / Details of Outcome (Guest Lecture / DC member / Co-guide / Project Reports / Other Reports/Publications)	:	<u>DC Member for</u> <u>Karpagavalli.T</u> Reg No: 17224014012043
6	Period of Collaboration	:	From : To:
7	Financial Involvement (if any)	:	—
8	Proof Attached	:	Yes / No
Signature of Principal		Signature of the Collaborating Faculty	
		 <b>Dr. P. PREMALATHA</b> HEAD & ASSOCIATE PROFESSOR DEPARTMENT OF ENGLISH SRI KGS ARTS COLLEGE SRIVAIKUNTAM.	
		 Signature of the Faculty	



MANONMANIAM SUNDARANAR UNIVERSITY  
CENTRE FOR RESEARCH  
ABISHEKAPATTI, TIRUNELVELI - 627 012, TAMILNADU, INDIA



**DR. K. SENTHAMARAI KANNAN**  
**DIRECTOR**

REF : MSU/RES/R1/JUNE2017

Date : August 10, 2017

**Ph.D., Programme Commencement Order**

To

KARPAGAVALLI T  
324, George Road  
Tamil Nadu, Thoothukudi, Pincode - 628002  
Mobile No. : 9487049284, Email ID : karpaga\_hari@yahoo.com

Sir/Madam,


Sub: Registration for doing Ph.D., programme - Date of Commencement of Research work -  
Intimation - Reg

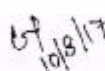
Ref: Counseling attended by the candidate.

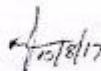
\*\*\*\*\*

With reference to the above, you are provisionally registered for Ph.D., Programme as detailed below :

- |   |  |                  |
|---|--|------------------|
| 1. Name of the Scholar                    | : KARPAGAVALLI T   | IDC - 21/12/2017 |
| 2. Registration No.                       | : 17224014012043   |                  |
| 3. Discipline                             | : English  |                  |
| 4. Gender                                 | : Female   |                  |
| 5. Social Category (Community)            | : BC   |                  |
| 6. Nationality                            | : Indian   |                  |
| 7. PWD Status                             | : Not Applicable   |                  |
| 8. Admission Based On                     | : M.Phil   |                  |
| 9. Name of the Supervisor                 | : Dr P Premalatha  |                  |
| 10. Name of the Co-Supervisor             | : Dr R Vasuhi  |                  |
| 11. Mode                                  | : PART TIME INTERNAL   |                  |
| 12. Research Centre                       | : Manonmaniam Sundaranar University, Tirunelveli.  |                  |
| 13. Date of Commencement                  | : 10.08.2017   |                  |
| 14. Proposed Title                        | : INTERIOR ODYSSEY- LIFE SUSTAINING MATRIX OF THE<br>PROTAGONISTS IN THE SELECT NOVELS OF BHARATHI<br>MUKHERJEE AND NERGIS DALAL   |                  |
| 15. Doctoral Committee<br>Members Details | : 1. DR JEYASUNDARRAJ<br>Associate Professor, Department of English, St. Johns College,<br>Tirunelveli.<br>Mobile No. : 9994192448, Email ID :<br>rajjeysundar@gmail.com<br>2. DR K HEMA<br>Assistant Professor, Department of English, Sadakathulleh<br>Appa College, Palayamkottai.<br>Mobile No. : 9486379448, Email ID : NIL |                  |

  
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10/08/17  
DIRECTOR





MANONMANIAM SUNDARANAR UNIVERSITY

CENTRE FOR RESEARCH

ABISHEKAPATTI, TIRUNELVELI - 627 012, TAMILNADU, INDIA



**DR. K. SENTHAMARAI KANNAN**  
**DIRECTOR**

Copy to :

<b>Guide :</b> Dr P Premalatha Associate Professor Department of English Sri KGS Arts College, Sri Vaikuntam Tamil Nadu Thoothukudi, Pincode - 628619 Mobile No. : 9486777704 Email ID : premlatha68@gmail.com	<b>Co-Guide :</b> Dr R Vasuhi Assistant Professor and Head ic Department of English Manonmaniam Sundaranar University Tamil Nadu, Thirunelveli Pincode - 627012 Mobile No. : 8870019491 Email ID : rvasuhi@gmail.com
<b>DC Member 1 :</b> DR JEYASUNDARRAJ Associate Professor, Department of English, St. Johns College, Tirunelveli.	<b>DC Member 2 :</b> DR K HEMA Assistant Professor, Department of English, Sadakathullah Appa College, Palayamkottai.
<b>Head of Department, English</b>	

**Instructions**

I DC - 21/12/2017

- All communication (letter) to this University should be forwarded by Supervisor / Co-Supervisor (wherever applicable)
- Candidates with M.Phil. qualification should earn 8 credits in the following options: 2 course works of 4 credits each (or) one course work of 4 credits and 1 mini project of 4 credits
- Fee of Rs. 5000/- for every sitting of Doctoral Committee meeting should be paid to the University before the conduct of every meeting
- TA / DA payable to the Doctoral Committee member by the Scholar/Supervisor/Co-Supervisor is to and fro II AC Railway fare and sitting fee of Rs. 500/- and refreshment / contingency cost of Rs.500/- (Bills to be submitted) which will be reimbursed on submission of bills.
- You should pay the Research fee of Rs. 14,000 /- per annum on or before June 30th of every year till the submission of thesis to the University through Demand Draft drawn in favour of "The Registrar Manonmaniam Sundaranar University", payable at Tirunelveli issued by any nationalised bank or through challan in Indian Bank. M.S University branch or through challan in state bank of India, Power Jothi account to MSU A/c 32723606944.
- For full-time scholars with M.Phil. qualification minimum period of the programme is 2 years and for PG holders 3 years.
- For part-time scholars with M.Phil. qualification minimum period is 3 years and for PG holders 4 years. The maximum period for all scholars is 6 years.
- It is also informed that the entire duration of the Ph.D., Research work is governed by the Ph.D., Regulations of 01.07.2016.
- For Details of functions of Doctoral Committee refer revised Ph.D., Research Guidelines w.e.f 01.07.2016 under the Head Doctoral committee(1.7)

Phone : 0462 - 2333741, 2338721, 9487999692, 9487907000, FAX: 2322973, Website : msuniv.ac.in



**Sadakathullah Appa College (Autonomous)**  
Rahmath Nagar, Tirunelveli - 627011

1	Name of the Faculty with Designation, Staff ID	:	<u>Dr. K. Hema</u> Assistant Prof. of English Staff ID: ATEN04
2	Name of the Collaborating Faculty with Designation	:	<u>Dr. A. Parvathavarthini</u> Assistant Prof. of English
3	Name of the Collaborating Organization	:	Aditanar College of Arts & Science Tiruchendur
4	Nature of Collaboration (Academic / Research / Faculty Exchange / Student Exchange / Project / Internship / On-the Job Training)	:	Research
5	Nature / Details of Outcome (Guest Lecture / DC member / Co-guide / Project Reports / Other Reports/Publications)	:	DC Member for <u>Mrs. K. Muneeswari</u> Reg. No: 17222024012003
6	Period of Collaboration	:	From: 10.8.2017 To: till date
7	Financial Involvement (if any)	:	—
8	Proof Attached	:	Yes / No
Signature of Principal		Signature of the Collaborating Faculty	
		Signature of the Faculty	

Dr. A. PARVATHAVARTHINI, M.A., Ph.D., D.G.T.  
ASSISTANT PROFESSOR OF ENGLISH  
ADITANAR COLLEGE OF ARTS AND SCIENCE  
VEERAPANDIANPATNAM, TIRUCHENDUR-620 216





**MANONMANIAM SUNDARANAR UNIVERSITY**  
**CENTRE FOR RESEARCH**  
**ABISHEKAPATTI, TIRUNELVELI - 627 012, TAMILNADU, INDIA**



**DR. K. SENTHAMARAI KANNAN**  
**DIRECTOR**

REF : MSU/RES/R1/JUNE2017

Date : August 10, 2017

**Ph.D., Programme Commencement Order**

To

MUNEESWARI K  
 242, Raj Kanna Nagar, Virapandianpatnam  
 Tiruchendur  
 Tamil Nadu, Thoothukudi, Pincode - 628216  
 Mobile No. : 9677643590, Email ID : eswarimunees@gmail.com

Sir/Madam,

Sub: Registration for doing Ph.D., programme - Date of Commencement of Research work -  
 Intimation - Reg

Ref: Counselling attended by the candidate.

\*\*\*\*\*

With reference to the above, you are provisionally registered for Ph.D., Programme as detailed below :

- |  |  |
|--|--|
| 1. Name of the Scholar                 | : MUNEESWARI K   |
| 2. Registration No.                    | : 17222024012003   |
| 3. Discipline                          | : English  |
| 4. Gender                              | : Female   |
| 5. Social Category (Community)         | : SCA  |
| 6. Nationality                         | : Indian   |
| 7. PWD Status                          | : Not Applicable   |
| 8. Admission Based On                  | : M.Phil   |
| 9. Name of the Supervisor              | : Dr A PARVATHAVARTHIINI   |
| 10. Name of the Co-Supervisor          | : NIL  |
| 11. Mode                               | : PART TIME INTERNAL   |
| 12. Research Centre                    | : Aditanar College of Arts & Science, Tiruchendur  |
| 13. Date of Commencement               | : 10.08.2017   |
| 14. Proposed Title                     | : FAMILIAL DISQUISITION ON THE SELECT NOVELS OF MANJU KAPUR AND JAISHREE MISRA   |
| 15. Doctoral Committee Members Details | : 1. DR K THANIKASALAM<br>Head & Associate Professor, Department of English, Aditanar College, Tiruchendur<br>Mobile No. : 9443022444, Email ID : thanika10@yahoo.com<br>2. DR K HEMA<br>Assistant Professor, Department of English, Sadakathullah Appa College<br>Mobile No. : 9486379448, Email ID :<br>hemaselvan11@gmail.com |

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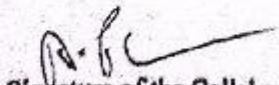
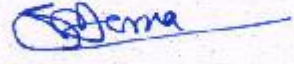
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10/8/17  
 AR

10/08/17  
 DIRECTOR



**Sadakathullah Appa College (Autonomous)**  
Rahmath Nagar, Tirunelveli - 627011

1	Name of the Faculty with Designation, Staff ID	:	<u>Dr. K. Hema,</u> Assistant Prof. of English Staff ID: ATEN04
2	Name of the Collaborating Faculty with Designation	:	<u>Dr. A. Parvathavarthini</u> Assistant Prof. of English
3	Name of the Collaborating Organization	:	Aditanar College of Arts & Science Tiruchendur
4	Nature of Collaboration (Academic / Research / Faculty Exchange / Student Exchange / Project / Internship / On-the Job Training)	:	Research
5	Nature / Details of Outcome (Guest Lecture / DC member / Co-guide / Project Reports / Other Reports/Publications)	:	DC Member for <u>J. Sathiyalakshmi</u> Reg. No. 17222024012005
6	Period of Collaboration	:	From: 10.08.2017 To: till date
7	Financial Involvement (if any)	:	—
8	Proof Attached	:	Yes / No
 Signature of Principal		 Signature of the Collaborating Faculty	
		 Signature of the Faculty	

Dr. A. PARVATHAVARTHINI, M.A., Ph.D., DGT.  
ASSISTANT PROFESSOR OF ENGLISH  
ADITANAR COLLEGE OF ARTS AND SCIENCE  
VEERAPANDIANPATNAM, TIRUCHENDUR-620 216





MANONMANIAM SUNDARANAR UNIVERSITY  
CENTRE FOR RESEARCH  
ABISHEKAPATTI, TIRUNELVELI - 627 012, TAMILNADU, INDIA



**DR. K. SENTHAMARAI KANNAN**  
**DIRECTOR**

REF : MSU/RES/R1/JUNE2017

Date : August 10, 2017

**Ph.D., Programme Commencement Order**

To

SATHIYALAKSHMI J  
13, C Block, Sivanthi Aditanar Staff Quarters  
Kumarapuram, Tiruchendur  
Tamil Nadu, Thoothukudi, Pincode - 628215  
Mobile No. : 9597544849, Email ID : rajesh84sathiya@gmail.com

Sir/Madam,

Sub: Registration for doing Ph.D., programme - Date of Commencement of Research work -  
Intimation - Reg

Ref: Counseling attended by the candidate.

\*\*\*\*\*

With reference to the above, you are provisionally registered for Ph.D., Programme as detailed below :

1. Name of the Scholar : SATHIYALAKSHMI J
2. Registration No. : 17222024012005
3. Discipline : English
4. Gender : Female
5. Social Category (Community) : BC
6. Nationality : INDIAN
7. PWD Status : Not Applicable
8. Admission Based On : M.Phil
9. Name of the Supervisor : PARVATHAVARTHINI A
10. Name of the Co-Supervisor : NIL
11. Mode : PART TIME INTERNAL
12. Research Centre : Aditanar College of Arts & Science, Tiruchendur
13. Date of Commencement : 10.08.2017
14. Proposed Title : VICTIMISATION TO EMANCIPATION OF WOMEN IN ANITA NAIRS  
SELECTED NOVELS
15. Doctoral Committee Members Details :
  1. DR K THANIKASALAM  
ASSOCIATE PROFESSOR, ADITANAR COLLEGE OF ARTS AND  
SCIENCE, TIRUCHENDUR  
Mobile No. : 9443022444, Email ID : thanka10@yahoo.com
  2. DR K HEMA  
ASSISTANT PROFESSOR, SADAKABTHULLAH APPA COLLEGE,  
TIRUNELVELI  
Mobile No. : 9486379448, Email ID :  
hemaselvan11@gmail.com

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10/08/17  
DIRECTOR



MANONMANIAM SUNDARANAR UNIVERSITY  
CENTRE FOR RESEARCH  
ABISHEKAPATTI, TIRUNELVELI - 627 012, TAMILNADU, INDIA



**DR. K. SENTHAMARAI KANNAN**  
**DIRECTOR**

Copy to :

<b>Guide :</b> PARVATHAVARTHINI A VIRAPANDIANPATNAM TIRUCHENDUR Tamil Nadu Thoothukudi, Pincode - 628216 Mobile No. : 9944190509 Email ID : apvathini@gmail.com	<b>Co-Guide :</b> NIL
<b>DC Member 1 :</b> DR K THIANKASAI AM ASSOCIATE PROFESSOR, ADITANAR COLLEGE OF ARTS AND SCIENCE, TIRUCHENDUR	<b>DC Member 2 :</b> DR K HEMA ASSISTANT PROFESSOR, SADAKABTHULLAH APPA COLLEGE, TIRUNELVELI
<b>The Principal, Aditanar College of Arts &amp; Science, Tiruchendur</b>	

**Instructions**

- All communication (letter) to this University should be forwarded by Supervisor / Co-Supervisor (wherever applicable)
- Candidates with M.Phil., qualification should earn 8 credits in the following options: 2 course works of 4 credits each (or) one course work of 4 credits and 1 mini project of 4 credits
- Research Centre Fee of Rs. 3000/- (per annum) to be paid to the Research Centre
- Fee of Rs. 5000/- for every sitting of Doctoral Committee meeting should be paid to the University before the conduct of every meeting
- TA / DA payable to the Doctoral Committee member by the Scholar/Supervisor/Co-Supervisor is to and fro II AC Railway fare and sitting fee of Rs. 500/- and refreshment / contingency cost of Rs.500/- (Bills to be submitted) which will be reimbursed on submission of bills.
- You should pay the Research fee of Rs. 11000 /- per annum on or before June 30th of every year till the submission of thesis to the University through Demand Draft drawn in favour of "The Registrar Manonmaniam Sundaranar University", payable at Tirunelveli issued by any nationalised bank or through challan in Indian Bank, M.S University branch or through challan in state bank of India, Power Jochi account to MSU A/c 32723606944.
- For full-time scholars with M.Phil. qualification minimum period of the programme is 2 years and for PG holders 3 years.
- For part-time scholars with M.Phil. qualification minimum period is 3 years and for PG holders 4 years. The maximum period for all scholars is 6 years.
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- For Details of functions of Doctoral Committee refer revised Ph.D., Research Guidelines w.e.f 01.07.2016 under the Head Doctoral committee(1.7)

Phone : 0462 - 2333741, 2338721, 9487999692, 9487907000, FAX: 2322973, Website : msuniv.ac.in





**Sadakathullah Appa College (Autonomous)**  
Rahmath Nagar, Tirunelveli - 627011

1	Name of the Faculty with Designation, Staff ID	:	Dr. K. Hema Assistant Prof. of English Staff ID: ATEN04
2	Name of the Collaborating Faculty with Designation	:	Dr. A. Parvathavarthini Assistant Prof. of English
3	Name of the Collaborating Organization	:	Aditanar College of Arts & Science Tiruchendur
4	Nature of Collaboration (Academic / Research / Faculty Exchange / Student Exchange / Project / Internship / On-the Job Training)	:	Research
5	Nature / Details of Outcome (Guest Lecture / DC member / Co-guide / Project Reports / Other Reports/Publications)	:	DC Member for G. Ebenezer Helan Reg. No: 17222024012002
6	Period of Collaboration	:	From: 10.08.2017 To: till date
7	Financial Involvement (if any)	:	—
8	Proof Attached	:	Yes / No
Signature of Principal		Signature of the Collaborating Faculty	
		Signature of the Faculty	

Dr. A. PARVATHAVARTHINI, M.A., Ph.D., D.C.T.  
ASSISTANT PROFESSOR OF ENGLISH  
ADITANAR COLLEGE OF ARTS AND SCIENCE  
VEERAPANDIANPATNAM, TIRUCHENDUR-628 216





MANONMANIAM SUNDARANAR UNIVERSITY  
CENTRE FOR RESEARCH  
ABISHEKAPATTI, TIRUNELVELI - 627 012, TAMILNADU, INDIA



**DR. K. SENTHAMARAI KANNAN**  
**DIRECTOR**

REF : MSU/RES/R1/JUNE2017

Date : August 10, 2017

**Ph.D., Programme Commencement Order**

To

EBENEZAR HELAN C  
11A, Samuel Street, Nazareth  
nil  
Tamil Nadu, Thoothukudi, Pincode - 628617  
Mobile No. : 9750787179, Email ID : helanganaraj06@gmail.com

Sir/Madam,

Sub: Registration for doing Ph.D., programme - Date of Commencement of Research work -  
Intimation - Reg

Ref: Counseling attended by the candidate.

\*\*\*\*\*

With reference to the above, you are provisionally registered for Ph.D., Programme as detailed below :

1. Name of the Scholar : EBENEZAR HELAN C
2. Registration No. : 17222024012002
3. Discipline : English
4. Gender : Female
5. Social Category (Community) : BC
6. Nationality : Indian
7. PWD Status : Not Applicable
8. Admission Based On : M.Phil
9. Name of the Supervisor : Dr Parvathavarthini A
10. Name of the Co-Supervisor : nil
11. Mode : PART TIME INTERNAL
12. Research Centre : Aditanar College of Arts & Science, Tiruchendur
13. Date of Commencement : 10.08.2017
14. Proposed Title : SOCIAL POLITICAL AND PSYCHOLOGICAL EXPATiation IN THE  
SELECT NOVELS OF INDIRA PARATHASARATHY
15. Doctoral Committee Members Details : 1. DR K THANIKASALAM  
DEPT OF ENGLISH, ADITANAR COLLEGE OF ARTS AND  
SCIENCE  
Mobile No. : 9443022444, Email ID : thanika10@yahoo.com  
2. DR K HFMA  
DEPT OF ENGLISH, SADAKATHULLAH APPA COLLEGE  
Mobile No. : 9486379448, Email ID :  
hemaselvan11@gmail.com

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10/8/17

DIRECTOR





MANONMANIAM SUNDARANAR UNIVERSITY  
CENTRE FOR RESEARCH  
ABISHEKAPATTI, TIRUNELVELI - 627 012, TAMILNADU, INDIA



Sep 15  
14-3-2017

**DR. K. SENTHAMARAI KANNAN**  
**DIRECTOR**

Copy to :

<b>Guide :</b> Dr Parvathavarthini A Assistant Professor Aditanar college of arts and science Tiruchendur Tamil Nadu Thoothukudi, Pincode - 628216 Mobile No. : 9944190609 Email ID : apvarthini@gmail.com	<b>Co-Guide :</b> nil nil nil nil Tamil Nadu, Thoothukudi Pincode - 628216 Mobile No. : Email ID :
<b>DC Member 1 :</b> DR K THANIKASALAM DEPT OF ENGLISH, ADITANAR COLLEGE OF ARTS AND SCIENCE	<b>DC Member 2 :</b> DR K HEMA DEPT OF ENGLISH, SADAKATHULLAI APPA COLLEGE
<b>The Principal, Aditanar College of Arts &amp; Science, Tiruchendur</b>	

#### Instructions


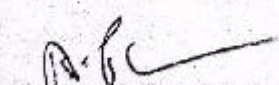
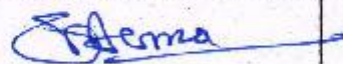
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- Fee of Rs. 5000/- for every sitting of Doctoral Committee meeting should be paid to the University before the conduct of every meeting
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Phone : 0462 - 2333741, 2338721, 9487993692, 9487907000, FAX: 2322973, Website : msuniv.ac.in





**Sadakathullah Appa College (Autonomous)**  
Rahmath Nagar, Tirunelveli - 627011

1	Name of the Faculty with Designation, Staff ID	:	<u>Dr. K. Hema,</u> Assistant Prof. of English Staff ID : ATENO4
2	Name of the Collaborating Faculty with Designation	:	<u>Dr. A. Parvathavarthini</u> Assistant Prof. of English
3	Name of the Collaborating Organization	:	Aditanar College of Arts & Science Tiruchendur
4	Nature of Collaboration (Academic / Research / Faculty Exchange / Student Exchange / Project / Internship / On-the Job Training)	:	Research
5	Nature / Details of Outcome (Guest Lecture / DC member / Co-guide / Project Reports / Other Reports/Publications)	:	DC Member for <u>Sivasankari</u> Reg. No: 17222024012007
6	Period of Collaboration	:	From: 10.8.2017 To: till date
7	Financial Involvement (if any)	:	—
8	Proof Attached	:	Yes / No
 Signature of Principal		 Signature of the Collaborating Faculty	
		 Signature of the Faculty	

Dr. A. PARVATHAVARTHINI, M.A., PH.D., D.G.T.  
ASSISTANT PROFESSOR OF ENGLISH  
ADITANAR COLLEGE OF ARTS AND SCIENCE  
VEERAPANDIANPATNAM, TIRUCHENDUR-628 216





**DR. K. SENTHAMARAI KANNAN**  
**DIRECTOR**

REF : MSU/RES/R1/JUNF2017

Date : August 10, 2017

**Ph.D., Programme Commencement Order**

To  
SIVASANKARI  
51D4 Masilamani Nagar, First Street, Ambai Road  
Kulavanigarpuram  
Tamil Nadu, Thirunelveli, Pincode - 627005  
Mobile No. : 9003333739, Email ID : shivaasankari.25@gmail.com

Sir/Madam,


Sub: Registration for doing Ph.D., programme - Date of Commencement of Research work -  
Intimation - Reg

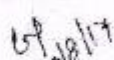
Ref: Counseling attended by the candidate.

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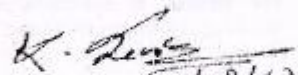
With reference to the above, you are provisionally registered for Ph.D., Programme as detailed below :

- |   |  |
|---|--|
| 1. Name of the Scholar                    | : SIVASANKARI  |
| 2. Registration No.                       | : 17222024012007   |
| 3. Discipline                             | : English  |
| 4. Gender                                 | : Female   |
| 5. Social Category (Community)            | : BC   |
| 6. Nationality                            | : Indian   |
| 7. PWD Status                             | : Not Applicable   |
| 8. Admission Based On                     | : M.Phil   |
| 9. Name of the Supervisor                 | : DR A PARVATHAVARTHINI  |
| 10. Name of the Co-Supervisor             | : NIL  |
| 11. Mode                                  | : PART TIME INTERNAL   |
| 12. Research Centre                       | : Aditanar College of Arts & Science, Tiruchendur  |
| 13. Date of Commencement                  | : 10.08.2017   |
| 14. Proposed Title                        | : DIASPORIC STUDY IN THE SELECT NOVELS OF CHITRA BANERJE :<br>DIVYAKARUNI  |
| 15. Doctoral Committee<br>Members Details | : 1. DR K THANIKASALAM<br>Associate Professor and Head, Department of English, Aditanar<br>College of Arts and Science, Tiruchendur - 628 216.<br>Mobile No. : 9443022444, Email ID : thanika10@yahoo.com<br>2. DR K HEMA<br>Assistant Professor, Department of English, Sadakathullah<br>Appa College, Tirunelveli - 627 011.<br>Mobile No. : 9486379448, Email ID : d.jockim@gmail.com |

  
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SUPDT

  
10/8/17  
AR

  
10/08/17  
DIRECTOR



MANONMANIAM SUNDARANAR UNIVERSITY  
CENTRE FOR RESEARCH  
ABISHEKAPATTI, TIRUNELVELI - 627 012, TAMILNADU, INDIA



**DR. K. SENTHAMARAI KANNAN**  
**DIRECTOR**

Copy to :

<b>Guide :</b> DR A PARVATHAVARTHINI Assistant Professor Department of English Aditanar College of Arts and Science, Tiruchendur Tamil Nadu Thoothukudi, Pincode - 628215 Mobile No. : 9944190609 Email ID : apvarthini@gmail.com	<b>Co-Guide :</b> NIL
<b>DC Member 1 :</b> DR K THANIKASALAM Associate Professor and Head, Department of English, Aditanar College of Arts and Science, Tiruchendur - 628 216.	<b>DC Member 2 :</b> DR K HEMA Assistant Professor, Department of English, Sadakathullah Appa College, Tirunelveli - 627 011.
<b>The Principal, Aditanar College of Arts &amp; Science, Tiruchendur</b>	

**Instructions**

- All communication (letter) to this University should be forwarded by Supervisor / Co-Supervisor (wherever applicable)
- Candidates with M.Phil., qualification should earn 8 credits in the following options: 2 course works of 4 credits each (or) one course work of 4 credits and 1 mini project of 4 credits
- Research Centre Fee of Rs. 3000/- (per annum) to be paid to the Research Centre
- Fee of Rs. 5000/- for every sitting of Doctoral Committee meeting should be paid to the University before the conduct of every meeting
- TA / DA payable to the Doctoral Committee member by the Scholar/Supervisor/Co-Supervisor is to and fro II AC Railway fare and sitting fee of Rs. 500/- and refreshment / contingency cost of Rs.500/- (Bills to be submitted) which will be reimbursed on submission of bills.
- You should pay the Research fee of Rs. 11000 /- per annum on or before June 30th of every year till the submission of thesis to the University through Demand Draft drawn in favour of "The Registrar Manonmaniam Sundaranar University", payable at Tirunelveli issued by any nationalised bank or through challan in Indian Bank, M.S University branch or through challan in state bank of India, Power Jothi account to MSU A/c 32723506944.
- For full-time scholars with M.Phil. qualification minimum period of the programme is 2 years and for PG holders 3 years.
- For part-time scholars with M.Phil. qualification minimum period is 3 years and for PG holders 4 years. The maximum period for all scholars is 5 years.
- It is also informed that the entire duration of the Ph.D., Research work is governed by the Ph.D. Regulations of 01.07.2016.
- For Details of functions of Doctoral Committee refer revised Ph.D., Research Guidelines w.e. 01.07.2016 under the Head Doctoral committee(1.7)