



Anand Nagar, Krishnankoil - 626126, Srivilliputtur (via), Virudhunagar District, Tamilnadu.

**APPLICATION FOR ADMISSION TO Ph.D. PROGRAMMES**

Date of Application:03-07-2021

|                  |                       |                 |           |
|------------------|-----------------------|-----------------|-----------|
| Department       | CIVIL ENGINEERING     | Application No. | 202110120 |
| Area of Research | ENGINEERING MATERIALS | Research Mode   | PART TIME |

**Name** :JESSYMOL GEORGE  
**Date of Birth / Age** :13-05-1980 / 41 Years  
**Gender** :FEMALE  
**Category** :OC  
**e-Mail ID** :jessymolgeorge@amaljyothi.ac.in  
**Mobile** :9747821408



|   |                          |  |                        |
|---|--------------------------|--|------------------------|
| <b>Father's/Husband's Name</b>  | TITY M THOMAS            | <b>Father's/Husband's Occupation</b>   | HOSPITAL ADMINISTRATOR |
| <b>Family Income</b>  | 5 LAKHS                  | <b>Residential Type</b>  | RURAL                  |
| <b>Birth Place</b>  | RAJAKKAD, IDUKKI, KERALA | <b>Mother Tongue</b>   | MLAYALAM               |
| <b>Religion</b>   | CHRISTIAN                | <b>Martial Status</b>  | MARRIED                |
| <b>Aadhaar No.</b>  | 923959761617             | <b>PAN No.</b>   | AQMPG6267F             |
| <b>Physically Challenged</b>  | NO                       | <b>Type of Disability</b>  | -NA                    |
| <b>Address for Communication:</b><br>AMAL JYOTHI COLLEGE OF ENGINEERING<br>KOOVAPPALLY P.O., KANJIRAPPALLY<br>KANJIRAPPALLY<br>KOTTAYAM DISTRICT<br>KERALA<br>INDIA<br>Pin-686518 |                          | <b>Permenant Address:</b><br>MAILADIYIL HOUSE C/O, PADMAKUMAR P.B., PANTHAPLACKA<br>PANACHEPPALLY P.O., KOOVAPPALLY<br>KANJIRAPPALLY<br>KOTTAYAM DISTRICT<br>KERALA<br>INDIA<br>Pin-686518 |                        |

| Qualification       |                        |                                |             |          |             |         |
|---------------------|------------------------|--------------------------------|-------------|----------|-------------|---------|
| Degree              | Discipline             | College/university             | Year Passed | AVG/CGPA | Class       | Mode    |
| ME                  | STRUCTURAL ENGINEERING | ANNA                           | 2008        | 83       | DISTINCTION | REGULAR |
| AMIE SECTION A&B    | CIVIL ENGINEERING      | INSTITUTION OF ENGINEERS INDIA | 2006        | 65       | FIRST CLASS | REGULAR |
| POLYTECHNIC DIPLOMA | CIVIL ENGINEERING      | TECHNICAL EDUCATION KERALA     | 2001        | 80       | DISTINCTION | REGULAR |

| Experience                         |                     |                 |               |                  |  |
|------------------------------------|---------------------|-----------------|---------------|------------------|--|
| Organization                       | Designation         | Experience From | Experience TO | Work Nature      |  |
| AMAL JYOTHI COLLEGE OF ENGINEERING | ASSISTANT PROFESSOR | 2008-07-07      | 2021-07-03    | TEACHING FACULTY |  |

| Payment Details        |                |                     |        |         |
|------------------------|----------------|---------------------|--------|---------|
| Transaction ID         | Reference      | Date of transaction | Amount | Status  |
| 202110120_210703115509 | VSIB0086094210 | 03-07-2021          | 600    | SUCCESS |

# **EXPERIMENTAL STUDY OF OPTIMAL MIX DESIGN OF FLY ASH BASED GEOPOLYMER CONCRETE AND ITS DURABILITY STUDIES**

## **Abstract**

Geopolymer Concrete is a better option for construction, compared to Ordinary Portland Cement concrete. The main reason for this insinuation is GPC minimize the emission of harmful greenhouse gases and also it minimizes the cost of construction by using fly ash as a binder material. In the use of fly ash as a binder material we need a proper Mix Design Method which gives optimal strength and durability. As per the available literature a better quality GPC mix depends upon – proportioning of ingredients, proportioning of optimum Alkali activator ratio, molarity of the alkali activator ratio, aggregate type and total aggregate to fine aggregate ratio, admixtures, the curing regime and temperature. Research works in this field are ongoing, to find a better Mix Design and design methods. But, until now research in this field has not attained a satisfactory mix design as compared to OPC concrete.

## **Introduction**

Geopolymer Concrete primarily consists of binder paste (fly ash and alkaline solution), aggregates (both fine and coarse), and admixtures. Considering strength parameters class F fly ash perform well as compared to class C fly ash. Alkaline activators are the chemical solution used along with the fly ash to generate binder paste. The alkali activator ratio and its molarity play an important role to obtain an optimal mix. In GPC the main constituent is the aggregates (70 to 80 %) of volume compared to Portland cement concrete. So the selection of aggregate type, gradation and total aggregate to fine aggregate ratio enhance the strength parameters. Admixtures are chemical materials which are added in fresh concrete to improve its durability, early strength, workability, setting time etc.

## **Objective**

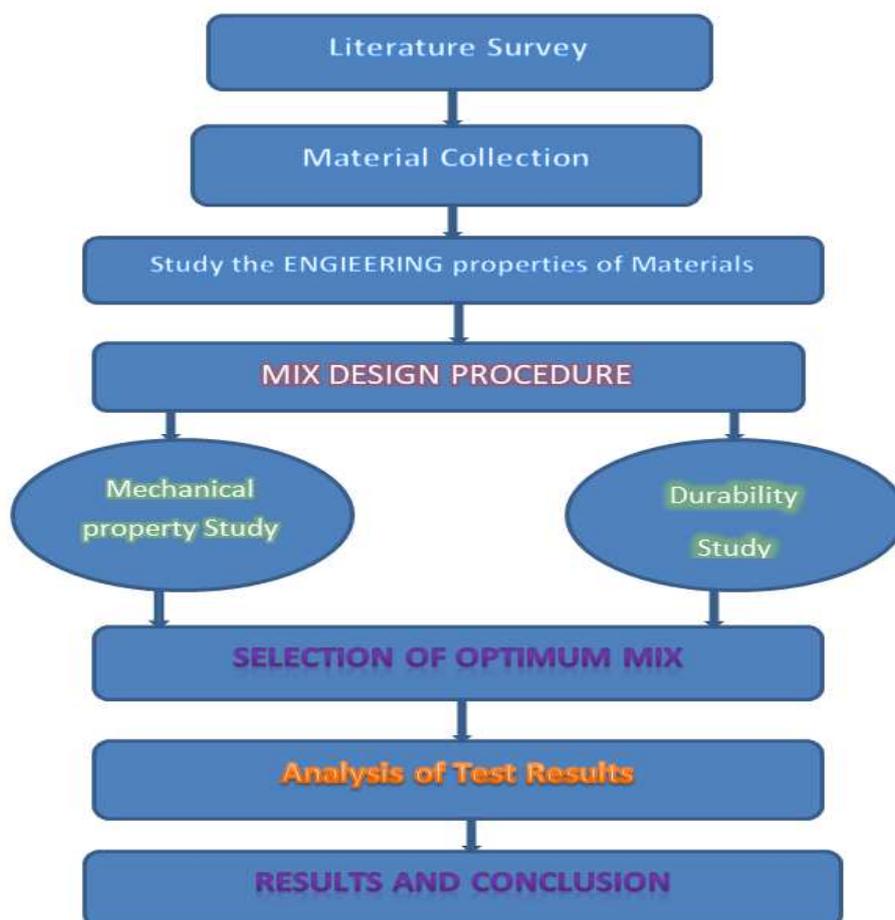
Main objective of the study is to find an optimum mix design using locally available materials. Here the material properties have a greater role in the mix strength. So the study should be started from the engineering properties of ingredients. Later the study lead is on design of an optimum mix of geopolymer concrete based on strength parameters such as compressive strength, splitting tensile strength and flexural strength. The next objective is to check the durability

parameters of the optimum mix such as permeability, sorptivity, acid and chemical resistance.

## Potential Applications

GPC is cost effective and is also a sustainable construction material as compared to Portland cement concrete. The main component of GPC, the fly ash, is an industrial by product and its use for construction is an effective mode of waste disposal and ecological sustainability.

## Methodology



## Conclusion

In order to reach an optimal mix designs the material proportioning must be appropriately correlated through the trial and error method. Alkali activator ratio and the molarity of alkaline solution also play an important role in the strength attainment. Here in our studies strength parameters along with durability parameters like permeability, sorptivity, accelerated corrosion, sulphate resistance,

acid resistance and serviceability parameters like cracks, deflexion etc. jointly determines the performance level of GPC and its use in huge construction are also thoroughly evaluated.

The searches for a substitute to ordinary Portland cement conferred the novel Geopolymer Concrete. Unearthing of a proper optimum mix design of GPC can reduce pollution due to manufacturing of OPC and the construction cost. From the available literature on Geopolymer concrete we understood that GPC is not only an environmental friendly construction material but also it possesses excellent mechanical properties, both in short term and long term. Further research is needed to understand the science behind geopolymer technology like microstructure, rheology of fresh concrete etc. The economic benefits and contributions of geopolymer concrete to sustainable development are evident. The reduced CO<sub>2</sub> emissions of GPC make them a good alternative to OPC. It can be said that the geopolymer concrete is good alternative as a construction material considering its strength and durability compared to OPC.

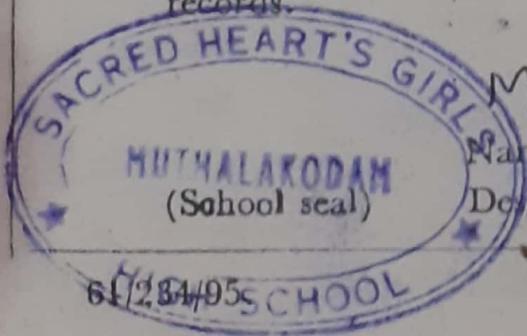
## References

1. Avinash Ojha, Praveen Aggarwal (2021) A review paper on fly ash based Geopolymer Concrete. Springer Nature B.V. 2021
2. Shriram Marathe, Mithanthaya, N Bhavani Shankar Rao (2016) A Review on Strength and Durability Studies on Geopolymer Concrete. IJIRSET
3. Salmabanu Luhar, Urvashi Khandelwal (2015) Durability Studies of Fly Ash Based Geopolymer Concrete. IJERA
4. Faiz Uddin Ahmed Shaikh (2016) Mechanical and durability properties of fly ash geopolymer concrete containing recycled coarse aggregates. International Journal of Sustainable Built Environment – ELSEVIER
5. Chithambar Ganesh.A, Muthukannan.M (2018) A Review of Recent Developments in Geopolymer Concrete. International Journal of Engineering & Technology



1. Name of Candidate... J.E.S.S.Y.MOL.GEORGE .....  
(In English, in block capitals, initials after the Name)  
(a) Expansion of initials, if any.....  
(b) Name in Regional Language. എ.ജി.എസ്.എം. ഗേ.ജി.ജി......
2. Sex (Male or Female)... Female.....
3. Religion. Christian..... 4. Caste... R.C.S.C......
5. Place of Birth... Vandamattam.....  
(a) Panchayat or Town. Kodikulam (b) Country... India.....
6. Nationality.. Indian.....
7. Date of Birth (in figures)... 13-5-1980.....  
(in words)... Thirteenth-May- Nineteen Eighty......
8. Name of Father... George T.J......
9. Name of Mother... Anice.....
10. Name of Guardian... George T.J......  
(as given in the admission register)
11. Relationship of the Guardian with the Pupil... Father.....
12. Occupation of the Parent/Guardian... Agriculture.....
13. Parent's or Guardian's Postal Address... Thattarkunnel.....  
Vandamattam P.O......
14. Mode of Presentation... Regular.....
15. Personal Marks of Identification  
(i) A black mole on the left fore arm.....  
(ii) Another mole on the left elbow.....

I certify that the entries in this page are accurate as per relevant school records.



Marysully K.M. [Signature]  
Name and Signature of Head of School with date  
Designation 29-3-96  
**S. H. GIRLS H. S.**  
**MUTHALAKODAM**

SI. No 80988

Register No. 980956

06/08/2003



STATE BOARD OF TECHNICAL EDUCATION

This is to certify that \_\_\_\_\_

JESSYMOL GEORGIE

is awarded the Diploma in CIVIL ENGINEERING

[THREE YEAR COURSE]

he/she having completed the prescribed course of study  
in the GOVERNMENT POLYTECHNIC, MUTTOM.

and having passed the Final Examination held in

APRIL 199 / 2001. He/She is placed

in the FIRST Class. WITH DISTINCTION.

KURIEN KOSHY  
DEPUTY DIRECTOR (GENERAL)  
IN CHARGE

JOINT CONTROLLER OF  
TECHNICAL EXAMINATIONS (KERALA)  
(Issued on behalf of the State Board of  
Technical Education, Kerala.)



Thiruvananthapuram,

13 SEP 2001  
.....200.....

GPT.

# The Institution of Engineers (India)

014634

ST419113-2



This is to certify that

**JESSY MOL GEORGE**

passed Sections A and B of the Institution Examinations  
in the **CIVIL** Engineering Branch  
in **WINTER 2003** and **WINTER 2005** respectively.



Kolkata

Dated **04.11.2006** President

Secretary and Director General

Government of India, in continuation to its earlier recognition, has recognised passing of Section A & B Examinations as revised, conducted by The Institution of Engineers (India), as equivalent to degree in the appropriate branch of engineering of the recognized universities in India and has notified in the Gazette of India, Part I, Section I, dated February 11, 2006.

# Anna University Chennai



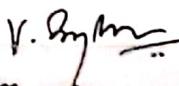
Reg. No.71206413008/RG

The Syndicate of the Anna University Chennai hereby makes known that **JESSYMOL GEORGE** has been admitted to the **DEGREE OF MASTER OF ENGINEERING** in **STRUCTURAL ENGINEERING** under the *Faculty of Civil Engineering*, having completed the prescribed programme of study and having been certified by the duly appointed examiners to be qualified to receive the same, and has been placed in **FIRST CLASS WITH DISTINCTION** at the Examination held in **JUNE 2008**.

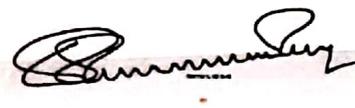
*Given under the Seal of the University*



Chennai 600 025  
India  
December 2008

  
Controller of Examinations

  
Registrar

  
Vice-Chancellor



# The Institution of Engineers (India)

8, GOKHALE ROAD, KOLKATA-700 020

|   |                                     |
|---|-------------------------------------|
| NAME AND ADDRESS OF THE CANDIDATE<br><b>MS JESSYMOL GEORGE<br/>         S/O SHRI GEORGE T J<br/>         THATTARUKUNNEL HOUSE<br/>         PO VANDAMATTAM CHERUNILAM THODUPUZHA<br/>         KERALA<br/>         685582</b> | MEMBERSHIP NO.<br><b>ST419113-2</b> |
|   | ROLL NO.<br><b>460423</b>           |

|   |                                 |                                       |   |
|---|---------------------------------|---------------------------------------|---|
| SESSION & YEAR<br>OF EXAMINATION<br><b>WINTER2005</b> | EXAMINATION<br><b>SECTION B</b> | BRANCH OF ENGINEERING<br><b>CIVIL</b> | DATE OF DECLARATION<br>OF RESULT<br><b>22/03/2006</b> |
|---|---------------------------------|---------------------------------------|---|

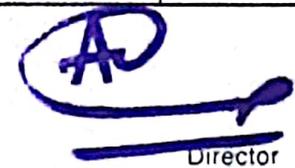
**Result of Examination :**

You have secured a final pass. The marks obtained by you are given below :

| SUBJECT   | Previous Exemption Marks | Current Exemption Marks |
|---|--------------------------|-------------------------|
| DESIGN AND MANUFACTURING                        |                          | 65                      |
| MANAGEMENT OF SYSTEMS                           | 66                       |                         |
| CONSTRUCTION AND FOUNDATION ENGINEERING         |                          | 62                      |
| THEORY OF STRUCTURES                            | 70                       |                         |
| WATER RESOURCES ENGINEERING                     |                          | 61                      |
| SURVEYING                                       | 76                       |                         |
| STRUCTURAL DESIGN                               |                          | 66                      |
| CONCRETE TECH, QUANTITY SURVEYING & VALUATION   | 61                       |                         |
| IRRIGATION ENGINEERING AND HYDRAULIC STRUCTURES |                          | 61                      |
| FLUID MECHANICS AND HYDRAULIC MACHINES          | 58                       |                         |
| <b>T O T A L</b>                                |                          | <b>646</b>              |



1. Full Marks : 100 in each subject.
2. Pass Marks : 35 in each subject.
3. Minimum aggregate marks : 50 percent of total marks.
4. Mathematics III : Minimum marks for pass : 50 (Marks obtained will not be included for assessment of results).

  
 Director

Education, Examinations & Accreditation

Shambhavi Forms Pvt. Ltd. Ph: 2213 1039 / 40



ANNA UNIVERSITY  
CHENNAI  
M.E.-DEGREE EXAMINATIONS

Folio No. FSS0555

JUNE/JULY 2008

CONSOLIDATED STATEMENT OF MARKS

| NAME OF THE CANDIDATE      |              | JESYMOL GEORGE                                | REGISTER NO.                    |     | 71206413008   |                         |
|----------------------------|--------------|---|---------------------------------|-----|---------------|-------------------------|
| COLLEGE OF STUDY           |              | 712, Kamarajuru College of Technology         | MONTH & YEAR OF LAST APPEARANCE |     | June 2008     |                         |
| PROGRAMME & SPECIALIZATION |              | M.E. Structural Engineering                   | REGULATIONS                     |     | 2005          |                         |
| SEM.                       | SUBJECT CODE | SUBJECT TITLE                                 | MAX                             | MIN | MARKS SECURED | MONTH & YEAR OF PASSING |
| 01                         | MA1602       | Applied Mathematics                           | 100                             | 50  | 085           | NOV 2006                |
| 01                         | ST1601       | Experimental Methods and Model Analysis       | 100                             | 50  | 082           | NOV 2006                |
| 01                         | ST1602       | Structural Dynamics                           | 100                             | 50  | 073           | NOV 2006                |
| 01                         | ST1603A      | Constitutive Models and Modes of Failure      | 100                             | 50  | 074           | NOV 2006                |
| 01                         | ST1630       | Maintenance and Rehabilitation of Structures  | 100                             | 50  | 073           | NOV 2006                |
| 01                         | ST1632       | Prestressed Concrete                          | 100                             | 50  | 069           | NOV 2006                |
| 02                         | ST1651       | Concrete Structures                           | 100                             | 50  | 077           | JUN 2007                |
| 02                         | ST1652       | Design of Substructures                       | 100                             | 50  | 077           | JUN 2007                |
| 02                         | ST1653       | Steel Structures                              | 100                             | 50  | 076           | JUN 2007                |
| 02                         | ST1654       | Computational Methods                         | 100                             | 50  | 068           | JUN 2007                |
| 02                         | ST1624       | Design of Bridges                             | 100                             | 50  | 077           | JUN 2007                |
| 02                         | ST1633       | Stability of Structures                       | 100                             | 50  | 079           | JUN 2007                |
| 02                         | ST1655       | Structural Engineering Laboratory             | 100                             | 50  | 097           | JUN 2007                |
| 03                         | ST1622       | Aseismic Design of Structures                 | 100                             | 50  | 080           | NOV 2007                |
| 03                         | ST1623       | CAAD for Structures                           | 100                             | 50  | 067           | NOV 2007                |
| 03                         | ST1626       | Design of Steel Concrete Composite Structures | 100                             | 50  | 096           | NOV 2007                |
| 03                         | ST1715       | Practical Training                            | 100                             | 50  | 100           | NOV 2007                |
| 03                         | ST1720       | Seminar                                       | 100                             | 50  | 100           | NOV 2007                |
| 04                         | ST1751       | Project Work                                  | 600                             | 300 | 542           | JUN 2008                |

\*\*\*End of Statement\*\*\*

**Classification : FIRST CLASS WITH DISTINCTION**  
**Total Marks : 1992 / 2400**  
**Percentage (rounded to nearest integer) : 83**



Medium of Instruction : ENGLISH

Chennai - 600 025.  
Date : 07/08/2008

Controller of Examinations

# Kumaraguru College of Technology

( Approved by AICTE, New Delhi and Affiliated to Anna University, Chennai )

Post Box No. 2034 : Coimbatore - 641 006

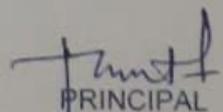
## TRANSFER CERTIFICATE

TC No. ....7952... Roll No. ....06MSE08..... Admission No. ..0609/PG/06-07..

1. (i) Name of the Student : **JESSYMOL GEORGE**
- (ii) Sex : FEMALE
2. Name of the Parent / Guardian : T.J.GEORGE
3. Nationality, Religion, Caste & Community : INDIAN, CHRISTIAN, RCSC [OC]
4. Date of Birth as entered in Admission Register : 13-05-80  
[Thirteenth May Nineteen Eighty]
5. (i) Date of Admission : 07-08-06
- (ii) Class in which the student admitted : First Year M.E.Structural Engineering
6. (i) Date on which the student actually left the College : 02-07-08
- (ii) Class in which the student was studying at the time of leaving : Final Year M.E.Structural Engineering
7. Whether qualified for promotion to a higher class : Refer Mark Sheet
8. Whether the student has paid all the fees due to the College : YES
9. Date on which Application for Transfer Certificate was made : 05-07-08
10. Reason for leaving : Course Completed

Date : 05-07-08



  
PRINCIPAL



AMAL JYOTHI  
COLLEGE OF ENGINEERING

B Tech in ECE & EEE  
Accredited by NBA  
**NBA**  
NATIONAL BOARD  
OF ACCREDITATION

Accredited by

**NAAC**  
NATIONAL ASSESSMENT AND  
ACCREDITATION COUNCIL

'A'  
Grade

NO.PS/EC/CE/0370/2021/154

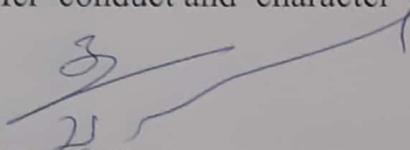
28, June 2021

### Experience Certificate

This is to certify that Ms. Jessymol George, Thattarukunnel, Kaliyar P O, Thodupuzha Idukki Kerala - 685582 has been working in this institution as Assistant Professor from 07 July 2008 in the Department of Civil Engineering.

This certificate is issued on her request for the purpose of applying for the PhD Entrance Exam.

Her conduct and character are very good

  
PRINCIPAL

Dr. Z. V. LAKAPARAMPIL  
PRINCIPAL  
AMAL JYOTHI COLLEGE OF ENGINEERING  
KOOVAPPALLY P.O., KANJIRAPPALLY  
KERALA - 686 518

#### Contact Info

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Kerala

Approved by  
AICTE, Delhi

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AMAL JYOTHI  
COLLEGE OF ENGINEERING

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OF ACCREDITATION

Accredited by  
**NAAC**  
NATIONAL ASSESSMENT AND  
ACCREDITATION COUNCIL  
| 'A'  
Grade

NO: PS/NOC/CE/0370/2021  
June 28, 2021

### NO OBJECTION CERTIFICATE

The College has no objection in Ms. Jessymol George, Assistant Professor in the Department of Civil Engineering, who has been working in this College from 07 July 2008, in applying for PhD studies.

PRINCIPAL

Copy to : HoD CE, Registrar, Deans, Principal

Dr. Z. V. LAKADARAMPIL  
PRINCIPAL  
AMAL JYOTHI COLLEGE OF ENGINEERING  
KOOVAPPALLY P.O., KANJIRAPPALLY  
KERALA - 686 518

#### Contact Info

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Technological University  
Kerala

Approved by  
AICTE, Delhi

[www.amaljyothi.ac.in](http://www.amaljyothi.ac.in)

आयकर विभाग  
INCOME TAX DEPARTMENT



भारत सरकार  
GOVT. OF INDIA

JESSYMOL GEORGE

GEORGE

13/05/1980

Permanent Account Number

AQMPG6267F

Signature



03022009



सर्वोच्च न्यायालय

GOVERNMENT OF INDIA



ജെസ്സീമോൾ ജോർജ്ജ്  
Jessymol George  
ജനന വർഷം/YoB:1980  
സ്ത്രീ Female



9239 5976 1617

ആധാർ - സാധാരണക്കാരന്റെ അവകാശം

Jessy

ANNEXURE-I

CERTIFICATE FROM THE ORGANISATION WHERE THE CANDIDATE IS EMPLOYED

Certified that Mr./Ms./Mrs. JESSYMOL GEORGE is employed as Assistant Professor (Designation) in the Civil Engineering (Department/Division Name) of Amal Jyothi College of Engineering (Institution/Industry Name).

We have no objection in forwarding his/her application for the Ph.D. Research Programme.

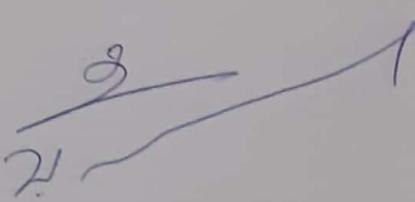
FOR FULL TIME:

The candidate will be sanctioned leave for the duration of the research programme and will be relieved from duty from x to x to x to undertake the full time research work in the University.

FOR PART TIME:

The candidate will be permitted to undertake part time study in the University/College and will be allowed to be present for discussions with the supervisor, attending course works, conduct of experiments and participations in seminars and related presentations. Further the required facilities at our organization will also be provided to the candidate for doing research.

Date: 29/06/2021

  
Signature of the Head of Organization with office seal

Dr. Z. V. LAKAPARAMPIL  
PRINCIPAL  
AMAL JYOTHI COLLEGE OF ENGINEERING  
KODUAPPALLY, KANJIRAPPALLY  
KERALA-686518

