



OFFICE OF THE DEAN

Faculty of Science

Kakatiya University, Warangal – 506 009 (T.S.), India
(Accredited with “A” Grade by the NAAC)

Prof. K.David
Dean
Professor of Geology

Phone: (O) 0870 – 2461434

No.20 /DFS/KUW/2021

Date: 16-03-2021

ORDER

Sub: Faculty of Sciences - Ph. D. Programme in Department of Mathematics – for the
Academic year 2015-2016 - Regarding
Ref: 15/DFS/KUW/2018 dated 09/02/2018

On the recommendation of the Admission Committee and with the approval of the Vice-Chancellor, Kakatiya University, Warangal, the following candidates has been provisionally selected for admission to the Ph. D. Programme for the year 2015-2016 in the Department of Mathematics.

SL NO	Name of Cadidates	Social Statues	Title of the Ph.D Research topic	Name of the Research Supervisor	Research
1	Sambasiva Rao S	OC	A study on conformal mappings and bilinear transformations	Dr.R.Bharavi sharma	Part-Time
2	Kadire Sunitha	OC	A study on reliability models	Dr.T.Sumathi Uma Maheswari	Part- Time
3	Aalla Ravi Kumar	BC-D	Some problems of wave propagation in micro-elastic solids	Dr. K.Somaiah	Part-Time
4	Kumar Ragula	BC-B	Numerical methods for a class of singularly perturbed differential – difference equations	Dr.B.S.L.Soujanya G.	Part-Time
5	Dolledla Harika	OC	Investigation of steady state probability vector of positive definite regularized linear systems of stochastic matrices	Dr.L.P.Raj Kumar	Part-Time
6	M.Venu Gopal	BC-D	Wave propagation in poroelastic solids	Prof.P.Malla Reddy	Part-Time
7	D.Venkanna	BC-D	Investigation of various variants in fluid flow through porous medium	Prof.P.Malla Reddy	Part-Time
8	Laxman Kumar. T	OC	Internet router modeling multi server transient queuing models	Prof.P.Malla Reddy	Part-Time
9	T.Thirupathi	BC-D	Performance analysis of multi server queuing systems with disaster	Dr.L.P.Raj Kumar	Part-Time
10	Swamakar Dornala	OC	Numerical study of mutiparameter singular perturbation problems	Dr.B.S.L.Soujanya. G	Part-Time
11	A.Satyanarayana	BC-B	Study on estimating the reliability for stress-strength models	Dr.M.Tirumala Devi	Part-Time

12	Yakoobpasha.MD	BC-B	Reliability to develop the stress dependent reliability models	Dr.T.Sumathi Uma Maheswari	Part-Time
13	Sandhya Rani Kanukuntla	BC-B	Estimation of reliability on stochastic stress-strength models	Dr.T.Sumathi Uma Maheswari	Part-Time
14	Gonela Anitha	BC-B	Propagation of waves in rotating micro elastic solids	Dr.K.Somaiah	Part-Time
15	Ala Sindhuja	BC-D	Study on anisotropic pore elastic solids using wave based methods	Prof.P.Malla Reddy	Part-Time
16	Kondam Ravinder Reddy	OC	Mathematical modeling of retrieval queuing system under fuzzy environment	Dr.L.P.Raj Kumar	Part-Time
17	Yakaiah.K	BC-A	A Study on the coefficient inequalities for some subclasses of analytic functions	Dr.R.Bharavi sharma	Part-Time
18	Chepuri Rajitha	SC	Performance study on the dependent queuing system with server on vacation	Dr.L.P. Raj Kumar	Part-Time
19	Venkateswara Rao Burugu	SC	Studies of wave propagation problems in elastic solids	Dr. K. Somaiah	Part-Time
20	Narsimhara Rao Kandula	SC	Wave propagation in different elastic solids	Dr. K. Somaiah	Part-Time
21	Gouraveni Saritha	ST	Reliability estimation for stress-strength models	Dr.M.Tirumala Devi	Full-Time
22	Sameena Afreen	BC-E	Study on survival Analysis	Dr.M.Tirumala Devi	Part-Time
23	Poonem Latha madhuri	ST	Study of wave propagation on anisotropic poro elastic solids using biot extension theory	Prof.P.Malla Reddy	Part-Time
24	M.Jyothirmai	BC-C	Performance study of priority based internet router with self similar input traffic transient queuing system markovian modelled input process	Prof.P.Malla Reddy	Part-Time


 DEAN 24/03/23

Copy to:

- 1.The Principal, University College, KU.
- 2.The Head, Department of Mathematics , KU
- 3.The Chairperson, Board of Studies in Mathematics , KU
- 4.The Supervisors concerned
- 5.The Controller of Examinations, KU
- 6.The Member In-charge, University Library, KU
- 7.The Deputy Registrar, Academic Branch, KU
- 8.The Secretary to Vice-Chancellor, KU
9. The SF



Department of Mathematics
Kakatiya University
Pre-Ph.D (Mathematics)
Paper-I
Research Methodology and Technical Writing

Unit-I

Research Methodology

Meaning of Research, Objectives of Research, Motivation in Research, Types of Research, Significance of Research. Review of the Literature, Writing Strategies. Mathematics and Computer Science Citation, Mathematical Subject Classification (MSC).

Unit-II

Research Metrics

Journals, Science Citation Indexing (SCI), Engineering Indexing (EI) and Scopus Indexing, Impact Factor (IF), Immediacy Index, H-index, definition, purpose, calculation, advantages and disadvantages. Research ethics and morals, plagiarism, acknowledgement and its index, intellectual copy rights.

Unit-III

MSWord and LaTeX

Manuscript preparation using MSWord and LaTeX, Sample document, type style, environments, lists, centering, tables, verbatim, vertical and horizontal spacing, equation environments, fonts, hats and underlining, braces, arrays and matrices, customized commands, maths styles, document classes and overall structure, titles for documents, sectioning commands, packages, inputting files, pictures, making a bibliography, making an index, preparation of ppt slides.

Unit-IV

MATLAB

Arithmetic operations, Built-in-Math functions, scalar variables, creating arrays, Built- in-functions for handling arrays, Mathematical operations with arrays and matrices, script files, Programming in MATLAB, two dimensional plots, three dimensional plots, polynomial, curve fitting and interpolation.

Text Books:

1. C.R.Kothari: Research Methodology, New Age International Publishers.
2. John W. Creswart : Research Design, Sage Publications India Pvt. Ltd., Third Edition.
3. Charles Lipson: Cite Right, The University of Chicago Press.
4. www.wikipedia.org
5. Laslie Lamport: LATFX, Addison Wesley Publications Company (1994).
6. David F: Griffiths, Desmond J.Higham: Learning LATEX. Society for Industrial and Applied Mathematics, Philadelphia (1997).
7. Rudra Pratap: Getting Started with MATLAB, Oxford University Press, 2002.

KAKATIYA UNIVERSITY

Department of Mathematics

Syllabus for Pre-Ph.D(Mathematics) Examination

Paper - II (Applied Mathematics Stream)

(Continuum Mechanics and Partial Differential Equations)

Unit-I (2 Questions)

Theory of Strain : Continuum - Continuum material point - Deformation - Material and spatial methods of descriptions - Measure of strain deformation - Small strain tensor - Extension of a line element and shear between two line elements - Change in volume due to strain deformation - Strain quadric - Transformation of strain components. Principal strain - Strain invariants, equations of computability of strain components. Time rate of change of a vector and tensor properties - Relationship between spatial and material method of description - Steady and unsteady motion - Stream line and path line - Boundary surface - Time rate of change of line element and time rate of change of angle between two line elements.

Unit-II (2 Questions)

Strain-rate tensor - Time rate of change of extension of a line element and time rate of change of shear between two line elements - Time rate of change of volume element - rate of dilatation.

Forces - Specification of stress vector on an arbitrary plane at a point - Stress tensor - Stress quadric - Principal stress - invariants - Extremum normal stress and shearing stress - Resolution of any stress system into uniform tension and shearing stress - Constitutive equations.

Unit-III (2 Questions)

Partial differential equations of second order - Derivation of canonical forms, hyperbolic equations - Parabolic equations - Elliptic equations.

Wave equation

Wave equation in one dimension - Solution of wave equation in one dimension - D'Almbert's solution - Green's function for the wave equations.

Elastic Waves

Stress waves in a semi - Infinite beam - Plane waves in a half-space - Plane waves in unbounded elastic body - Rayleigh waves - Love waves.

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Unit-IV (2 Questions)**Potential equation**

Harmonic functions and complex variables - Green's identities - Properties of harmonic functions in bounded regions - Solution of the Laplace's equation by the method of separation of variables.

Heat equation

The boundary conditions - The maximum principle of the parabolic equation and consequences - Uniqueness theorems - Stability of the solution - Solution of the heat equation by the method of separation of variables.

Text Books:

1. Mathematical theory of Continuum Mechanics by Rabindranath Chatterje
2. Continuum Mechanics by D.S. Chandrasekharaiah, Lokenath Debnath
3. Analytical Methods in Engineering by J.B. Doshi.

KAKATIYA UNIVERSITY

Department of Mathematics

Syllabus for Pre-Ph.D(Mathematics) Examination

Paper - II (Pure Mathematics Stream)

Advanced Complex Analysis

Unit-I (Analytic and Harmonic Functions) (2 questions)

Analytic functions, Cauchy-Riemann equations, Harmonic functions, Borel-Carathodory theorem, Poisson's integral formula, Positive harmonic functions, Harnack's functions, Harnack's inequality, Harnack's principle.

Scope as in: Complex Variables - Herb Silverman, Complex Variables Theory and Applications - H.S. Kasana.

Unit-II (Conformal Mappings and Bilinear Transformations) (2 questions)

Introduction, Conformality theorem, Bilinear transformations, Special bilinear transformations, Exponential transformations, Trigonometric transformations, Normal families, Riemann mapping theorem.

Scope as in: Complex variables - Herb Silverman, Complex Variables Theory and Applications - H.S. Kasana.

Unit-III (Elementary Theory of Univalent Functions) (2 questions)

Definition of univalent functions and elementary properties, Area theorem, Coefficient conjecture, Coefficient estimates, Growth and distortion theorems to the class 'S', Function with positive real part.

Scope as in: Complex variables - Herb Silverman, Univalent Functions - P.L.Duren, Univalent Functions - A.W.Goodman (Vol.I).

Unit-IV (Sub Classes of 'S') (2 questions)

Starlike and convex functions, close to convex functions, spiral like functions, α -convex functions, α -spiral like functions, basic properties, coefficient estimates, rotation theorem.

Scope as in: Complex variables - Herb Silverman, Univalent functions - P.L.Duren, Univalent functions - A.W.Goodman.

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KAKATIYA UNIVERSITY

Department of Mathematics

Syllabus for Pre-Ph.D(Mathematics) Examination

Paper - II (Statistics Stream)

Markov Chains - Numerical Solutions

Unit-I (Poisson Process and Markov Chains) (2 questions)

Definition and examples of stochastic process, Poisson process, Markov chains, The Chapman-Kolmogorov equations, classification of states, Mathematical classification, The stationary distribution of ergodic chains, Balance equations for stationary probabilities, Uniqueness of stationary probabilities.

Sections 6.1, 6.2, 8.1.1 - 8.1.6 (Text book 1)

Unit-II (Markov Process) (2 questions)

Semi-Markov processes, Markov processes, Variation of M/M/1 queue, The G/M/1 queue, Uniformized Markov processes, The Chapman-Kolmogorov differential equations.

Sections 8.3 - 8.8 (Text book 1)

Unit-III (Matrix Geometric Solutions) (2 questions)

Matrix geometric systems, General matrix geometric solutions, Matrix geometric solutions for Markov chains, Phase distributions.

Sections 9.1 - 9.3, 9.5 (Text book 1)

Unit-IV (Numerical Solutions of Markov Chains with MATLAB) (2 questions)

Non-negative matrices, Non-negative decomposable matrices, The theorem of Perron Frobenius.

Iterative methods: The power method, Jacobi, Gauss-Seidal, Successive Over Relaxation (SOR), symmetric SOR, and related MATLAB programs.

Sections 1.5, 3.1, 3.2 (Text book 2)

Text Books:

1. Probability, Stochastic Processes, and Queueing Theory, Randolph Nelson, Springer-Verlag.
2. Introduction to the Numerical Solutions of Markov Chains, William J. Stewart, Princeton University Press.

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KAKATIYA UNIVERSITY

Department of Mathematics

Syllabus for Pre-Ph.D(Mathematics) Examination

Paper - II (Pure Mathematics Stream)

(Near Rings)

Unit-I (The Structure of Near-Rings (2 Questions))

Near-ring, the near-ring of all mappings on a group G , the near-ring of all zero respecting mappings on G , sub near ring, abelian near-ring, commutative near-ring, zero near-ring, zero symmetric near-ring, constant near-ring, trivial zero symmetric near-ring and trivial constant near-ring. Near-ring homomorphism and isomorphisms. Ideal (left, right) of a near-ring. Quotient near-ring, natural homomorphism associated with an ideal, Kernel of homomorphism, R -subgroup (left, right) of a near-ring R , simple near-ring.[Articles 1.1 to 1.40 of Chapter 1]

Unit-II (Near-Ring Modules (2 Questions))

R -module, faithful representation, centralizer near-ring. The right regular representation of a near-ring, R -submodule. Unital R -module, R -module homomorphism and isomorphism, quotient R -module. Annihilator of a subset.[Articles 2.1 to 2.37 of Chapter 2]

Unit-III (Primitive Near-Rings (2 Questions))

Monogenic R -module, R -module of type 0, R -module of type 1, R -module of type 2. V -primitive near-ring. The stabilizer. [Articles 3.1 to 3.37 of Chapter 3]

Unit-IV (More on 2-Primitive Near-Rings (2 Questions))

Rank, Projection, Minimal condition, Maximal condition, $DCCS$, $DCCR$, $DCCI$, $ACCS$, $ACCR$, $ACCI$. [Articles 4.1 to 4.28 of Chapter 4]

Text Book: Near-Rings and their Links with Groups by J. D. P. Meldrum

Research Notes in Mathematics-134 (Advanced Publishing Program, Pitman Publishing Limited, 128 Long Acre, London, WC2E, 9AN, UK.

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KAKATIYA UNIVERSITY

Department of Mathematics

Syllabus for Pre-Ph. D. (Mathematics) Examination

Paper - II (Applied Mathematics Stream)

(Numerical Analysis and Numerical Solutions of Differential Equations)

Unit-I (2 Questions)

The Solution of Numerical Algebraic and Transcendental Equations

Introduction, Finding Approximate Values of the Roots, Finding Roots by Repeated Application of Location Theorem, The Method of Interpolation, or of False Position (Regula- Falsi), Solution by Repeated Plotting on a Larger Scale, The Newton-Raphson method, A Special Procedure for Algebraic Equations, The Method of Iteration, Convergence of the Iteration Process, Convergence of the Newton-Raphson method.

Numerical Solution of Simultaneous Linear Equations

Solution by Successive Elimination of the Unknowns: The Method of Division by Leading Coefficients, The Method of Gauss, Another Version of the Gauss Method, Solution by Inversion of Matrices, Solution by Iteration: Systems Solvable by Iteration. (Scope as in 'Numerical Mathematical Analysis' by JAMES B SCARBOROUGH, 6th Edition Articles 67 - 71, 74, 75, 77, 78 and 94 - 102)

Unit-II (2 Questions)

Elements of Ordinary Differential Initial Value Problem Approximation

Introduction, Initial Value Problems, Difference Equations and Numerical Methods

Singlestep Methods

Introduction, Taylor Series Method, Runge - Kutta Methods: Second order, Third order and Fourth order Runge - Kutta Methods.

Multistep Methods

Introduction, Explicit Multistep Methods: Adams - Bashforth formulae ($j = 0$), Nystrom's formula ($j = 1$), Formulae for $j = 0, 1, 3, 5$.

(Scope as in 'Numerical Solution of Differential Equations' by M. K. Jain, Chapters 1.1, 1.2, 1.3, 1.4, 2.1, 2.2, 2.3 (2.3.1, 2.3.2, 2.3.3), 3.1 and 3.2 (3.2.1, 3.2.2, 3.2.3))

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Unit-III (2 Questions)

Difference Methods for Boundary Value Problems in Ordinary Differential Equations

Introduction, Approximate Methods: Shooting methods, Difference methods, Difference Approximation to derivatives, Nonlinear Boundary Value Problem $y'' = f(x, y)$: Difference scheme based on quadrature formulae, Second order linear boundary value problems, Solution of tridiagonal system.

Finite Element Methods

Introduction, Weighted Residual Methods: Least square method, Partition method, Galerkin method. Variational Methods: Ritz Method

(Scope as in 'Numerical Solution of Differential Equations' by M. K. Jain, Chapters 4.1, 4.2, 4.3(4.3.1, 4.3.2, 4.3.3), 8.1, 8.2 (8.2.1, 8.2.2, 8.2.3), 8.3)

Unit-IV (2 Questions)

The Numerical Solution of Partial Differential Equations

Introduction, Difference Quotients and Difference Equations: Difference Quotients, Difference Equations, The Method of Iteration: Solution of Difference Equations by Iteration, The Method of Relaxation: Solution of Difference Equations by Relaxation, Triangular Networks, Block Relaxation, The Iteration and Relaxation Methods Compared.

(Scope as in 'Numerical Mathematical Analysis' by JAMES B SCARBOROUGH, 6th Edition Articles 122, 123, 124, 125, 128, 129, 130 and 131)

Text Books:

1. Numerical Mathematical Analysis by JAMES B SCARBOROUGH
2. Numerical Solution of Differential Equations by M. K. JAIN



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Dated 07-06-2018

No.126/M/UC/KU/2018

To
The Dean
Faculty of Sciences
Kakatiya University, Warangal-506 009, Telangana

Sub:- Dept. of Mathematics – Ph.D. Candidates details – for the academic year 2015- 2016 ,
2016-2017 – Regarding.

Ref:- Your Ltr. No. 78/DFS/KU/2018 dated 29-05-2018.

Sir

With reference to the subject cited above, on the recommendations of the Departmental Research Committee (DRC) I am herewith submitting the Ph.D. Candidates details, Supervisor's Name and Title of the research topic for the academic years 2015-2016, 2016-2017.

Sl. No	Nam Of The Candidates	Name Of The Supervisor	Topic Of Research	Full Time Part Time
1.	S. Sambasiva Rao	Dr. R. Bharavi Sharma	A Study on conformal mappings and bilinear Transformations	Part-Time
2.	Kadire Sunitha	Dr. T. Sumathi Uma Maheshwari	A Study on Reliability Models	Part-Time
3.	Aalla Ravi Kumar	Dr. K. Somaiah	Some Problems of Wave Propagation In Micro-Elastic Solids	Part-Time
4.	Kumar Ragula	Dr. BSL Soujanya G	Numerical Methods for a Class of Singularly Perturbed Differential – Difference Equation	Part-Time
5.	Dolleda Harika	Dr. L.P. Rajkumar	Investigation of steady state Probability Vector of Positive Definite Regularized Linear Systems of Stochastic Matrices	Part-Time
6.	M. Venu Gopal	Prof. P. Malla Reddy	Wave Propagation in Poro elastic Solids	Part-Time
7.	D. Venkanna	Prof. P. Malla Reddy	Investigation of Various Variants in fluid flow Through Pours medium	Part-Time
8.	T. Laxman Kumar	Prof. P.Malla Reddy	Internet Router Modeling Multi server Transient Queuing models	Part-Time
9.	T. Thirupathi	Dr. L.P. Rajkumar	Performance Analysis of Multi server Queuing Systems with Disaster	Part-Time
10.	Swarnakar Dornala	Dr. BSL Soujanya G	Numerical Study of multi Parameter Singular Perturbation Problems	Part-Time
11.	A. Satyanarayana	Dr. M. Tirumala Devi	Study on Estimating the Reliability for Stress-Strength Models	Part-Time
12.	Yakoobpasha Md.	Dr. T. Sumathi Uma Maheshwari	Reliability to Develop the Stress Development reliability Models	Part-Time
13.	Sandhya Rani Kanukuntla	Dr. T. Sumathi Uma Maheshwari	Estimation of Reliability on Stochastic Stress-Strength Models	Part-Time
14.	Gonela Anitha	Dr. K. Somaiah	Propagation of Waves in Rotating Micro Elastic Solids	Part-Time
15.	Ala Sindhuja	Prof. P. Malla Reddy	Study of Anisotropic Pore Elastic Solids Using Wave based Methods	Part-Time
16.	Kondam Ravinder Reddy	Dr. L.P. Rajkumar	Mathematical Modeling of Retrieval Queuing System Under Fuzzy Environment	Part-Time
17.	Yakaiah K.	Dr. R. Bharavi Sharma	A Study on the coefficient inequalities for some subclasses of analytic function	Part-Time
18.	Chepuri Rajitha	Dr. L.P. Rajkumar	Performance Study on the Dependent Queuing Systems with Server on Vacation	Part-Time
19.	Venkateshwara Rao	Dr. K. Somaiah	Studies of wave propagation problems in elastic solids	Part-Time

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<i>S.No</i>	<i>Nam Of The Candidates</i>	<i>Name Of The Supervisor</i>	<i>Topic Of Research</i>	<i>Full Time Part Time</i>
20.	Narsimha RaoKandula	Dr. K. Somaiah	Wave propagation in different elastic solids	Part-Time
21.	Gouraveni Saritha	Dr. M. Tirumala Devi	Reliability Estimation for Stress-strength Models	Full-Time
22.	Sameena Afreen	Dr. M. Tirumala Devi	Study on Survival Analysis	Part-Time
23.	Poonem Latha Madhuri	Prof. P. Malla Reddy	Study of wave Propagation on anisotropic poro elastic solids using biot extension theory	Part-Time
24.	M. Jyothirmai	Prof. P. Malla Reddy	Performance Study of Priority based Internet Router With Self Similar Input Traffic Transient Queueing System Markovian Modelled Input Process	Part-Time

Thanking You,


Head