BOARD OF STUDIES FOR MATHEMATICS

MINUTES OF THE MEETING

The meeting of the Board of Studies for Mathematics was held on 20.08.2025 at 02:00 PM at CMR Technical Campus, Kandlakoya (V), Medchal Road, Hyderabad – 501 401.

The following members attended the meeting:

S. No	Name	Designation	Role	Signature
1	Dr. A. Raji Reddy	Director, CMR Technical Campus	Special Invitee	
2	Dr. V. Kesava Reddy	Professor & Head Department of Mathematics, CMR Technical Campus	Chairman	
3	Dr. M. N. Raja Shekar Reddy	Prof. of Mathematics, JNTUH University College of Engg. Jagtial.	University Nominated Member	
4	Dr. Ch Achi Reddy	Professor of Mathematics, MLR Institute of Technology, Hyderabad.	Subject Expert	
5	Dr. R Ramakrishna	Professor of Mathematics, Vidya Jyothi Institute of Technology, Hyderabad.	Subject Expert	
6	Dr. K. Bhagya Lakshmi	Assoc. Professor, Department of Mathematics, CMR Technical Campus, Hyderabad.	Subject Expert	
7	Dr. D T V Dharmajee Rao	Professor & Dean Academics, CMR Technical Campus Hyderabad.	Special Invitee	

Dr. V. Kesava Reddy, Professor of Mathematics & Chairman, Board of Studies welcomed all the members and presented the **R25** scheme & syllabus. The same has been thoroughly discussed in detail and approved as follows:

(P.T.O.)

CMR TECHNICAL CAMPUS

UGC AUTONOMOUS

B. Tech. I Year Syllabus

Common for CSE [AI & ML] & CSE[DS]

I SEMESTER

S. No	Course Code	Course Title	L	T	P	Credits
1	25MA101BS	Matrices and Calculus	3	1	0	4
2	25PH102BS	Advanced Engineering Physics	3	0	0	3
3	25EC103ES	Basic Electrical Engineering	3	0	0	3
4	25CS104ES	Programming for Problem Solving	3	0	0	3
5	25ME105ES	Computer Aided Engineering Graphics	0	1	2	2
6	25PH106BS	Advanced Engineering Physics Lab	0	0	2	1
7	25EC107ES	Basic Electrical Engineering Lab	0	0	2	1
8	25CS108ES	Programming for Problem Solving Lab	0	0	2	1
9	25CS109ES	Python Programming Lab	0	0	2	1
10	25CS110ES	IT Workshop	0	0	2	1
11		Induction Program				
		Total Credits	**12**	**2**	**12**	**20**

II SEMESTER

S. No	Course Code	Course Title	L	T	P	Credits
1	25MA201BS	Ordinary Differential Equations and Vector Calculus	3	1	0	4
2	25CH202BS	Engineering Chemistry	3	0	0	3
3	25EN203HS	English for Skill Enhancement	3	0	0	3
4	25EC204ES	Basic Electronics	3	0	0	3
5	25CS205ES	Data Structures	3	0	0	3
6	25CH206BS	Engineering Chemistry Lab	0	0	2	1
7	25EN207HS	English Language and Communication Skill Lab	0	0	2	1
8	25CS208ES	Data Structures Lab	0	0	2	1
9	25EC209ES	Idea & Innovation Lab	0	0	2	1
		Total Credits	**15**	**1**	**8**	**20**

R. Ramakrishna

CMR TECHNICAL CAMPUS

UGC AUTONOMOUS

B. Tech. I Year Syllabus

Common for CSE & ECE

I SEMESTER

S. No	Course Code	Course Title	L	T	P	Credits
1	25MA101BS	Matrices and Calculus	3	1	0	4
2	25CH102BS	Engineering Chemistry	3	0	0	3
3	25EN103HS	English for Skill Enhancement	3	0	0	3
4	25EC104ES	Basic Electronics	3	0	0	3
5	25CS105ES	Programming for Problem Solving	3	0	0	3
6	25CH106BS	Engineering Chemistry Lab	0	0	2	1
7	25EN107HS	English Language and Communication Skill Lab	0	0	2	1
8	25CS108ES	Programming for Problem Solving Lab	0	0	2	1
9	25EC109ES	Idea & Innovation Lab	0	0	2	1
10		Induction Program				
		Total Credits	**15**	**1**	**8**	**20**

II SEMESTER

S. No	Course Code	Course Title	L	T	P	Credits
1	25MA201BS	Ordinary Differential Equations and Vector Calculus	3	1	0	4
2	25PH202BS	Advanced Engineering Physics	3	0	0	3
3	25EC203ES	Basic Electrical Engineering	3	0	0	3
4	25CS204ES	Data Structures	3	0	0	3
5	25ME205ES	Computer Aided Engineering Graphics	0	1	2	2
6	25PH206BS	Advanced Engineering Physics Lab	0	0	2	1
7	25EC207ES	Basic Electrical Engineering Lab	0	0	2	1
8	25CS208ES	Data Structures Lab	0	0	2	1
9	25CS209ES	Python Programming Lab	0	0	2	1
10	25CS210ES	IT Workshop	0	0	2	1
		Total Credits	**12**	**2**	**12**	**20**

R. Ramakrishna

Matrices and Calculus

(Common to All Branches)

Code:25MA101BS
I Year I Semester

L	T	P	C
3	1	0	4

Pre-requisites: Mathematical Knowledge at pre-university level

Objectives:

To learn

- Applying basic operations on matrices and their properties,concept of a rank of the matrix and applying this concept to know the consistency and solving the system of linear equations.
- Concept of eigen values and eigen vectors and to reduce the quadratic form to canonical form
- Mean value theorems and their application to the mathematical problems
- Finding maxima and minima of functions of two and three variables.
- Evaluation of multiple integrals and their applications.

UNIT-I: Matrices **8 L**

Rank of a matrix by Echelon form and Normal form – Inverse of Non-singular matrices by Gauss-Jordan method. System of linear equations: Solving system of Homogeneous and Non-Homogeneous equations. Gauss jacobi and Gauss Seidel Iteration Method.

UNIT-II: Eigen values and Eigen vectorsp **10 L**

Linear Transformation and Orthogonal Transformation: Eigen values – Eigen vectors and their properties – Cayley-Hamilton Theorem (without proof) – Finding inverse and power of a matrix by Cayley-Hamilton Theorem. Quadratic forms and Nature of the Quadratic Forms – Reduction of Quadratic form to canonical form by Orthogonal Transformation.

UNIT-III: Single Variable Calculus **10 L**

Limit and Continuous of functions and its properties. Mean value theorems: Rolle's theorem – Lagrange's Mean value theorem – Cauchy's Mean value Theorem – Taylor's Series for single variable, Taylor's Series for function of two variables(All the theorems without proof).

20-8-25

21/8/2025

R. Ramakrishna

UNIT-IV: Multivariable Calculus (Partial Differentiation and applications) **10 L**

Definitions of Limit and continuity – Partial Differentiation: Euler's Theorem – Total derivative – Jacobian – Functional dependence & independence. Applications: Maxima and minima of functions of two variables and three variables using method of Lagrange multipliers.

UNIT-V: Multivariable Calculus (Integration) **10 L**

Evaluation of Double Integrals (Cartesian and polar coordinates) – change of order of integration (only Cartesian form) – Change of variables for double integrals (Cartesian to polar). Evaluation of Triple Integrals. Applications: Areas by double integrals and volume by Triple integrals.(simple examples)

Course outcomes:

After learning the contents of this paper, the student must be able to

- Write the matrix representation of a set of linear equations and to analyze the solution of the system of equations
- Find the Eigen values and Eigen vectors,Reduce the quadratic form to canonical form using orthogonal transformations.
- Solve the applications of the mean value theorems.
- Find the extreme values of functions of two variables with/ without constraints.
- Evaluate the multiple integrals and apply the concept to find areas,volumes.

Text Books

1. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010.
2. R.K. Jain and S.R.K. Iyengar, Advanced Engineering Mathematics, Narosa Publications, 5th Editon, 2016.

References

1. Erwin Kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.
2. G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9thEdition, Pearson, Reprint, 2002.
3. N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications, Reprint, 2008.
4. H. K. Dass and Er. Rajnish Verma, Higher Engineering Mathematics, S Chand and Company Limited, New Delhi.

20.8.25

21/8/2025

R. Ramakrishna

CMR TECHNICAL CAMPUS

UGC AUTONOMOUS

Accredited by NBA & NAAC with 'A' Grade

Approved by AICTE, New Delhi and JNTU Hyderabad

Computational Mathematics Lab

(Using Python/MATLAB software)

(common For All Branches)

(II Year I Sem for CSE allied branches)

(II Year II Sem for CSEbranche)

Code:25MA306BS

L	T	P	C
0	0	2	1

Pre-requisites: Matrices, Iterative methods and ordinary differential equations

Objectives:

To learn

- Solve problems of Eigen values and Eigen Vectors using Python/MATLAB.
- Solution of Algebraic and Transcendental Equations using Python/MATLAB
- Solve problems of Linear system of equations
- Solve problems of First-Order ODEs Higher order linear differential equations with constant coefficients

*** Visualize all solutions Graphically through programmes**

UNIT-I: Eigen values and Eigenvectors: **6P**

Programs:

- Finding real and complex Eigen values.
- Finding Eigen vectors.

UNIT-II: Solution of Algebraic and Transcendental Equations **6P**

Bisection method, Newton Raphson Method

Programs:

- Root of a given equation using Bisection method.
- Root of a given equation Newton Raphson Method.

UNIT-III: Linear system of equations: **6P**

Jacobi's iteration method and Gauss-Seidal iteration method

Programs:

- Solution of given system of linear equations using Jacobi's method
- Solution of given system of linear equations using Gauss-Seidal method

20.8.25

R. Ramabrish

UNIT-IV: First-Order ODEs **8P**

Exact and non-exact equations, Applications: exponential growth/decay, Newton's law of cooling.

Programs:

- Solving exact and non-exact equations
- Solving exponential growth/decay and Newton's law of cooling problems

UNIT-V: Higher order linear differential equations with constant coefficients **6P**

Programs:

- Solving homogeneous ODEs
- Solving non homogeneous ODEs

Course outcomes:

After learning the contents of this paper, the student must be able to

- Develop the code to find the Eigen values and Eigen Vectors using Python/MATLAB.
- Develop the code find solution of Algebraic and Transcendental Equations and Linear system of equations using Python/MATLAB
- Write the code to solve problems of First-Order ODEs Higher order linear differential equations with constant coefficients

Text Books

1. MATLAB and its Applications in Engineering, Rajkumar Basal, Ashok Kumar Geo, Manoj Kumar Sharama, Pearson publication.
2. Kenneth A. Lambert, The fundamentals of Python: First Programs, 2011, Cengage Learnings.
3. Think Python First Edition, by Allen B. Downey, Orielly publishing.
4. Introduction to Python Programming, William Mitchell, Povel Solin, Martin Novak et al., NCLab Public Computing, 2012.
5. Introduction to Python Programming, ©Jacob Fredslund, 2007.

References

1. An Introduction to Python, John C. Lusth, The University of Alabama, 2011.
2. Introduction to Python, ©Dave Kuhlman, 2008.

20.8.25

R. Ramalakshmi

Ordinary Differential Equations and Vector Calculus

(Common to CSE,CSM,CSD,ECE)

Code:25MA201BS
I Year II Semester

L	T	P	C
3	1	0	4

Pre-requisites: Mathematical Knowledge at pre-university level

Objectives:

To learn

- Methods of solving the differential equations of first and higher order.
- Concept, properties of Laplace transforms.
- Solving ordinary differential equations using Laplace transforms techniques.
- The physical quantities involved in engineering field related to vector valued functions
- The basic properties of vector valued functions and their applications to line, surface and volume integrals

Course outcomes:

After learning the contents of this paper, the student must be able to

- Identify whether the given differential equation of first order is exact or not
- Solve higher differential equation and apply the concept of differential equation to real world problems.
- Use the Laplace Transforms techniques for solving Ordinary Differential Equations.
- Evaluate gradient,divergence and curl of a vector differential operator
- Evaluate the Line, Surface and Volume integrals and converting them from one to another

UNIT-I: First Order Ordinary Differential Equations **8 L**

Exact differential equations – Equations reducible to exact differential equations – linear and Bernoulli's equations – Orthogonal Trajectories (only in Cartesian Coordinates). Applications: Newton's law of cooling – Law of natural growth and decay.

UNIT-II: Ordinary Differential Equations of Higher Order **10 L**

Higher order linear differential equations with constant coefficients: Non-Homogeneous terms of the type $e^{ax}, \sin ax, \cos ax$, polynomials in x, $e^{ax}V(x)$ and $x\,V(x)$ – Method of variation of parameters.

R. Ramakrishna 21/8/2025 20.8.25

UNIT-III: Laplace Transforms **10 L**

Laplace Transforms: Laplace Transform of standard functions – First shifting theorem – Laplace transforms of functions multiplied by 't' and divided by 't' – Laplace transforms of derivatives and integrals of function – Evaluation of integrals by Laplace transforms – Laplace transform of periodic functions – Inverse Laplace transform by different methods, convolution theorem (without proof). Applications: solving Initial value problems by Laplace Transform method.

UNIT-IV: Vector Differentiation **10 L**

Vector point functions and scalar point functions – Gradient – Divergence and Curl – Directional derivatives – Vector operators – Scalar potential functions – Solenoidal and Irrotational vectors.

UNIT-V: Vector Integration **10 L**

Line, Surface and Volume Integrals. Theorems of Green, Gauss and Stokes (without proofs) and their applications

Text Books

1. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010.
2. R.K. Jain and S.R.K. Iyengar, Advanced Engineering Mathematics, Narosa Publications, 5th Editon, 2016.

References

1. Erwin Kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.
2. G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9thEdition, Pearson, Reprint, 2002.
3. N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications, Reprint, 2008.
4. H. K. Dass and Er. Rajnish Verma, Higher Engineering Mathematics, S Chand and Company Limited, New Delhi.

21/8/2025

20.8.25

R. Ramakrishna

CMR TECHNICAL CAMPUS

UGC AUTONOMOUS

Accredited by NBA & NAAC with 'A' Grade

Approved by AICTE, New Delhi and JNTU Hyderabad

Mathematical and Statistical Foundations

(Common for CSE(AI&ML) and CSE(DS))

Code:25MA301BS
II Year I Semester

L	T	P	C
3	0	0	3

Pre-requisites: Mathematics courses of first year of study.

Objectives:

To learn

- The Probability distributions of Discrete Random variables.
- The Probability distributions of Continuous Random variables&sampling theory
- The Testing of hypothesis
- Making statistical inferences.
- The Number Theory basic concepts useful for cryptography etc

Course outcomes:

After learning the contents of this paper, the student must be able to

- Apply the concepts of Random variables.
- Analyse the concept of distributions to some case studies.
- Examine the given statistical Hypothesis.
- Fit the curve, correlation and regression for the given data.
- Apply the number theory concepts to cryptography domain.

UNIT-I: Random Variables and Probability Distributions **10L**

Concept of a Random Variable – Discrete Probability Distributions – Continuous Probability Distributions – Mean of a Random Variable – Variance of a Random Variable

Discrete Probability Distributions: Binomial Distribution – Poisson distribution

UNIT-II: Continuous Distributions and Sampling **10 L**

Normal Distribution – Areas under the Normal Curve – Applications of the Normal Distribution – Normal Approximation to the Binomial Distributions. **Fundamental Sampling Distributions:** Random Sampling – Some Important Statistics – Sampling Distributions – Sampling Distribution of Means – Central Limit Theorem.

UNIT-III: Tests of Hypotheses (Large and Small Samples) **10 L**

Statistical Hypotheses: General Concepts – Testing a Statistical Hypothesis. Single sample: Tests concerning a single mean. Two samples: Tests on two mean (Unknown for equal variance). One sample: Test on a single proportion. Two samples: Tests on two proportions. Two- sample tests concerning variances: F-distribution

R. Ramakrishna 21/8/2025 20.8.25

UNIT-IV: Applied Statistics **10 L**

Curve fitting by the method of least squares – Fitting of straight lines – Second degree parabolas and more general curves – Correlation and Regression – Rank correlation.

UNIT-V: Basics of Number Theory **10 L**

Greatest Common Divisors and Prime Factorization: Greatest common divisors – The Euclidean algorithm – The fundamental theorem of arithmetic – Factorization of integers and the Fermat numbers.

Text Books

1. Ronald E. Walpole, Raymond H. Myers, Sharon L. Myers, Keying Ye, Probability & Statistics for Engineers & Scientists, 9th Ed. Pearson Publishers.
2. S C Gupta and V K Kapoor, Fundamentals of Mathematical statistics, Khanna publications.
3. Kenneth H. Rosen, Elementary Number Theory & its Applications, sixth edition, Addison Wesley, ISBN 978 0-321-50031-1.
4. Dr.T.K.V. Iyengar, B.Krishna Gandhi, S. Ranganatham and Dr.M.V.S.S.N.Prasad, Probability and statistics , S.Chand, EigthRevisesed edition ,2020.

References

1. T.T. Soong, Fundamentals of Probability and Statistics for Engineers, John Wiley & Sons, Ltd, 2004.
2. Sheldon M Ross, Probability and statistics for Engineers and scientists, academic press
3. Miller and Freund's, Probability and Statistics for Engineers, 8th Edition, Pearson Educations.

24/8/2025 20-8-25

R. Ramakrishna

CMR GROUP OF INSTITUTIONS
EXPLORE TO INVENT

CMR TECHNICAL CAMPUS

UGC AUTONOMOUS
Accredited by NBA & NAAC with 'A' Grade
Approved by AICTE, New Delhi and JNTU Hyderabad

Numerical Methods and Complex Variables

(ECE)

Code:25MA401BS
II Year II Semester

L	T	P	C
3	0	0	3

Pre-requisites: Mathematics courses of first year of study.

Objectives:

To learn

- Expressing periodic function by Fourier series and a non-periodic function by Fourier transforms
- Various numerical methods to find roots of polynomial and transcendental equations.
- Concept of finite differences and to estimate the value for the given data using interpolation.
- Evaluation of integrals using numerical techniques and Solving ordinary differential equations of first order using numerical techniques.
- Differentiation and integration of complex valued functions.
- Evaluation of integrals using Cauchy's integral formula and Cauchy's residue theorem.Expansion of complex functions using Taylors and Laurents

UNIT-I: Fourier Series & Fourier Transforms **8 L**

Fourier series – Dirichlet's Conditions – Half-range Fourier series – Fourier Transforms: Fourier Integral Theorem (Only statements), Fourier Sine and Cosine transforms (Elementary illustrations)

UNIT-II: Numerical Methods-I **10 L**

Solution of polynomial and transcendental equations: Bisection method – Iteration Method – Newton-Raphson method and Regula-Falsi method. Finite differences: forward differences – backward differences – Interpolation using Newton's forward and backward difference formulae – Lagrange's method of interpolation.

UNIT-III: Numerical Methods-II **10 L**

Numerical integration: Trapezoidal rule - Simpson's 1/3rd and 3/8th rules.

Ordinary differential equations: Taylor's series – Euler's method – Runge-Kutta method of fourth order for first order ODE.

UNIT-IV: Complex Differentiation **10L**

Differentiation of Complex functions – Analyticity – Cauchy-Riemann equations (without proof) – Harmonic Functions – Finding harmonic conjugate – Milne-Thomson method .

R. Ramakrishna 21/8/2025 20-8-25

UNIT-V: Complex Integration **10 L**

Line integral – Cauchy's theorem – Cauchy's Integral formula – Zeros of analytic functions – Singularities , Taylor's series-Laurent's series(without proof),Residues – Cauchy Residue theorem (All theorems without Proof).

Course outcomes:

After learning the contents of this paper, the student must be able to

- Express any periodic function in terms of sine and cosine.
- Find the root of a given polynomial and transcendental equations.
- Estimate the value for the given data using interpolation
- Find the numerical solutions for a given first order ODE's
- Analyze the complex function with reference to their analyticity, integration using Cauchy's integral and residue theorems. Taylors and Laurents series expansion in complex functions

Text Books

1. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010.
2. S.S. Sastry, Introductory methods of numerical analysis, PHI, 4th Edition, 2005.
3. T.K.V. Iyengar, B. Krishna Gandhi, Engineering Mathematics, S. Chand Publishers .

References

1. Murray R. Spiegel, Ph.D., Seymour Lipschutz, Ph.D., John J. Schiller, Ph.D., Dennis Spellman, Ph.D., Complex Variables (Schaum's outline)
2. M. K. Jain, S.R.K. Iyengar, R.K. Jain, Numerical methods for Scientific and Engineering Computations, New Age International publishers.
3. Erwin Kreyszig, Advanced Engineering Mathematics, 9thEdition, John Wiley &Sons, 2006.
4. J. W. Brown and R. V. Churchill, Complex Variables and Applications, 7th Edition, Mc-Graw Hill, 2004

R. Ramabrin

CMR TECHNICAL CAMPUS

UGC AUTONOMOUS

Accredited by NBA & NAAC with 'A' Grade

Approved by AICTE, New Delhi and JNTU Hyderabad

Computer Oriented Statistical Methods

(CSE)

Code:25MA401BS
II Year II Semester

L	T	P	C
3	0	0	3

Pre-requisites: Mathematics courses of first year of study.

Objectives:

To learn

- The theory of Random Variables.
- The Probability distributions of Discrete & Continuous Random variables.
- The sampling theory and Estimation.
- The Testing of hypothesis
- Making statistical inferences.

Course outcomes:

After learning the contents of this paper, the student must be able to

- Apply the concepts of Random variable
- Analyse the concept of distributions to some case studies.
- Formulate and solve problems by apply statistical methods for analysing experimental data and demonstrate concept of estimation.
- Examine the given statistical Hypothesis.
- Fit the curve, correlation and regression for the given data.

UNIT-I: Random Variables and Probability Distributions **10 L**

Concept of a Random Variable – Discrete Probability Distributions – Continuous Probability Distributions – Mean of a Random Variable – Variance of a Random Variable.

UNIT-II: Discrete & Continuous Distributions **10L**

Discrete Probability Distributions: Binomial Distribution – Poisson distribution

Continuous Probability Distributions: Normal Distribution – Areas under the Normal Curve – Applications of the Normal Distribution – Normal Approximation to the Binomial Distributions.

UNIT-III: Sampling Distributions & Estimation **10L**

Fundamental Sampling Distributions: Random Sampling – Some Important Statistics – Sampling Distributions – Sampling Distribution of Means – Central Limit Theorem.

Estimation-Introduction – Statistical Inference – Classical Methods of Estimation – Single Sample: Estimating the mean – Standard error of a point estimate. Two samples: Estimating the difference between two means– Single sample: Estimating a proportion – Two samples: Estimating the difference between two proportions.

R. Ramalorien 21/8/2025 20-8-25

UNIT-IV: Tests of Hypotheses (Large and Small Samples) **10 L**

Statistical Hypotheses: General Concepts – Testing a Statistical Hypothesis. Single sample: Tests concerning a single mean. Two samples: Tests on two mean. One sample: Test on a single proportion. Two samples: Tests on two proportions.

Small Sample tests: Testing a Statistical Hypothesis. Single sample: Tests concerning a single mean. Two samples: Tests on two mean .Two- sample tests concerning variances: F-distribution.

UNIT-V: Applied Statistics **10 L**

Curve fitting by the method of least squares – Fitting of straight lines – Second degree parabolas and more general curves – Correlation and Regression – Rank correlation.

Text Books

1. Ronald E. Walpole, Raymond H. Myers, Sharon L. Myers, Keying Ye, Probability & Statistics for Engineers & Scientists, 9th Ed. Pearson Publishers.
2. S C Gupta and V K Kapoor, Fundamentals of Mathematical statistics, Khanna publications.
3. Dr.T.K.V. Iyengar, B.Krishna Gandhi, S. Ranganatham and Dr.M.V.S.S.N.Prasad, Probability and statistics , S.Chand, EigthRevisesed edition ,2020.

References

1. T.T. Soong, Fundamentals of Probability and Statistics for Engineers, John Wiley & Sons, Ltd, 2004.
2. Sheldon M Ross, Probability and statistics for Engineers and scientists, academic press
3. Miller and Freund's, Probability and Statistics for Engineers, 8th Edition, Pearson Educations.

21/8/25

20-8-25

R. Ramalakshmi