

Paper Code: BAS-202

L T C

Paper Title: Advanced Engineering Mathematics

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INSTRUCTIONS TO PAPER SETTERS:

Maximum Marks : 60

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 20 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should of 10 marks.

UNIT 1

Linear Algebra: Vector Space over real and complex, basis, dimension, Linear transformation, matrix representation.

Linear Programming: Geometry of linear programming, Graphical method, Linear programming (LP) in standard form, Solution of LP by simplex method.

(10 Hrs)

UNIT 2

Big M, Two phase methods and various cases like alternate, unbounded optimal solution, infeasible solutions. Duality theory : Weak duality, strong duality and complementary slackness theorems (without proof), Transportation and Assignment problems (methods only).

(10 Hrs)

UNIT 3

Transportation and Assignment problems (methods only).

Probability: Random Variables: Definition, Discrete and Continuous Random Variables, Probability functions, Distribution Functions, Cumulative distributions functions, expectation, moment generating functions and their first four moments, Uniform and Binomial distribution. (10 Hrs)

UNIT 4

Exponential, Poisson and Normal distributions.

Statistics : Linear Regression, Least Square principal and the Fitting models, Karl Pearson's Correlation Coefficient, Rank Correlation, Lines of Regression (two variables only). (10 Hrs)

Text Books:

1. Krishnamurthy, V.K., Mainra, V.P. and Arora, J.L., *An introduction to Linear Algebra*, Affiliated East West Press (1976).
2. Kambo N. S., *Mathematical Programming Techniques*, East-West Press Pvt. Ltd., 2005
3. Chandra S., Jayadeva, Aparna Mehra, *Numerical Optimization with Applications*, Narosa Publishing House, 2009
4. Meyer, P.L.. *Introductory Probability and Statistical Applications*, Oxford, 1970 2nd ed

References Books :

1. Gilbert Strang, *Linear Algebra and its Applications*, Cenage Learning, 4th ed. 2010.
2. Johnson, R., Miller, I. and Freund, J., *Miller and Freund's Probability and Statistics for Engineers*, Pearson Education, 2005, 7th ed.
3. Walpole, Ronald E., Myers, Raymond H., Myers, Sharon L. and, Keying Ye, *Probability and Statistics for Engineers and Scientists*, Pearson Education, 2007, 8thed.
4. Ross, S.M., *Introduction to probability and Statistics for Engineers and Scientists*, Academic Press, 2009.