Mathematics III 16(MA 301)

Theory Marks - 100 **Pass Marks – 35** **Sessional Marks – 50**
Time: 3 hours

Unit 1: Calculus of Complex Variables: 25 Marks

Analytic functions, C-R equations, Conjugate functions, Harmonic functions, Orthogonal systems, Formation of analytic functions, Conformal mapping, complex integration, simply and multiply connected regions, Cauchy's integral theorem, Cauchy's integral formula.
Power series representation of complex functions: Taylor's series, Laurent's series, singularities, Residue theorem, Calculation of Residues.

Unit 2: Laplace Transforms: 20 Marks

Laplace transforms of some elementary functions, shifting theorems, change of scale property, Linearity, Inverse Laplace transforms, Laplace transforms of derivatives and integrals, Convolution theorem, Laplace transform of unit step function, Application to Differential equations.

Unit 3::Fourier Series: 15 marks
Fourier series expansion of f(x) in $c<x<c+2\pi$, Dirichlet's conditions, fourier series for discontinuous functions, change of intervals, half range series.

Unit 4: Probability and Statistics: 40 Marks
Curve fitting, correlation and Regression Analysis:
Bivariate distribution, Scatter diagram, fitting of straight lines by the method of least squares, Karl Pearsons co-efficient of correlation and co-efficient of linear regression and their properties, Lines of Regression.
Probability Distribution: Random experiment, Sample space, Laws of Probability, Baye's theorem, Random variable, Discrete & Continuous probability distribution, Mathematical expectation, probability density function, Mean and variance of probability distribution(discrete & continuous).
Theoretical distribution: Binomial, Poisson & normal distribution.
Joint probability distribution & Markov chains: Joint probability distribution, Marginal distribution, conditional probability distribution, statistical independence, covariance, correlation coefficient, stochastic process or random process, Marcov chain, Transition matrix, probability vector, stochastic matrix.

Text/References: -

1. A text book of Engineering Mathematics : Bali and Goyal:Laxmi Publications(P) Ltd.
2. Higher Engineering Mathematics : B.S. Grewal: Khanna Publishers
3. Lapalce and Fourier Transforms: M.D.Raisinghania: S.Chand & Company Ltd.
4. Schaum's outline series: Theory & Problems of statistics, M R Spiegel, McGraw Hill
5. Stochastic Process: Dr. J. Medhi
6. Hihger engineering mathematics: B. V. Ramanna, Tata McGraw Hill
7. ******