

## MCA1.1.4 PROBABILITY, STATISTICS & QUEUING THEORY

**Instruction: 3 Periods /week**

**Sessional Marks: 30**

**Univ-Exam : 3 Hours**

**Univ-Exam-Marks**

**Probability:** Definitions of probability, Addition theorem, Conditional probability, Multiplication theorem, Bayes theorem of probability and Geometric probability.

**Random variables and their properties:** Discrete Random variable, Continuous Random variable, Probability Distribution joint probability distributions their properties, Transformation variables, Mathematical expectations, probability generating functions.

**Probability Distributions / Discrete distributions :** Binomial, Poisson Negative binomial distributions and their properties. (Definition, mean, variance, moment generating function., Additive properties, fitting of the distribution.)

**Continuous distributions :** Uniform, Normal, exponential distributions and their properties.

**Multivariate Analysis :** Correlation, correlation coefficient, Rank correlation, Regression Analysis, Multiple Regression, Attributes, coefficient of Association,  $\chi^2$  – test for goodness of fit, test for independence.

**Estimation:** Sample, populations, statistic, parameter, Sampling distribution, standard error, unbiasedness, efficiency, Maximum likelihood estimator, notion & interval estimation.

**Testing of Hypothesis:** Formulation of Null hypothesis, critical region, level of significance, power of the test.

**Small Sample Tests :** Testing equality of means, testing equality of variances, test of correlation coefficient, test for Regression Coefficient.

**Large Sample tests:** Tests based on normal distribution

**Queuing theory :** Queue description, characteristics of a queuing model, study state solutions of M/M/1:  $\alpha$  Model, M/M/1 ; N Model, M/M/C: Model, M/M/C: N Model **Case studies**

**Text Books:**

Probability & Statistics for Engineers and Scientists, Walpole, Myers, Myers, Ye. Pearson Education.

Probability, Statistics and Random Processes T.Veerarajan Tata McGraw – Hill

**Reference Book:**

Probability & Statistics with Reliability, Queuing and Computer Applications, Kishor S. Trivedi, Prentice Hall of India ,1999