

18BTMT402: Probability and Queuing Theory 3 1 0 4

CA: 40 Marks

FE: 60 Marks

No. of Total Lectures = 45 Hours

UNIT I 9

RANDOM VARIABLES

Discrete and continuous random variables – Probability density function, Moments, Moments generating functions, Binomial, Poisson, Geometric, Negative binomial, Uniform, Exponential, Gamma and Normal distribution.

UNIT II 9

TWO DIMENSIONAL RANDOM VARIABLES

Joint distributions - Marginal and conditional distributions – Covariance - Correlation and Regression -simple linear regression and Multiple linear regression, Transformation of random variables - Central limit theorem.

UNIT III 9

MARKOV PROCESS AND MARKOV CHAINS

Introduction, Properties of Markov chains, Classification - Stationary process - Markov process- Poisson process, Markov chains - Transition probabilities, Chapman Kolmogorov equations – Limiting distributions

UNIT IV 9

QUEUEING THEORY

Queuing system, transient and steady state, traffic intensity, distribution queuing system, concepts of queuing models (M/M/1:INFINITY/FCFS), (M/M/1:N/FCFS), (M/M/1:INFINITY/SIRO), Queues with finite waiting rooms.

UNIT V 9

MARKOVIAN QUEUES AND QUEUE NETWORKS

Introduction to Markovian and non-markovian queues, Multiple channel model: (M/M/S: INFINITY/FCFS), (M/M/S: N/FCFS), (M/M/S: S/FCFS), Single service counter and arrivals through multiple channels, open and closed networks.

TEXT BOOKS

1. O.C. Ibe, “Fundamentals of Applied Probability and Random Processes”, Elsevier, 1st Indian Reprint, 2007
2. D. Gross and C.M. Harris, “Fundamentals of Queueing Theory”, Wiley Student edition, 2004
3. Probability and Statistics for Engineers and Scientists by Ronald E, Walpole, Pearson Prentice Hall, 2007, 8th edition.

REFERENCES

1. A.O. Allen, "Probability, Statistics and Queueing Theory with Computer Applications", Elsevier, 2nd edition, 2005.
2. H.A. Taha, "Operations Research", Pearson Education, Asia, 8th edition, 2007.
3. K.S. Trivedi, "Probability and Statistics with Reliability, Queueing and Computer Science Applications", John Wiley and Sons, 2nd edition, 2002.
4. S.D. Sharma, "Operations Research" Theory, Methods and Applications, Kedarnath Ramnath Publication, Latest Edition.
5. Statistical Methods by S.P. Gupta, S. Chand & sons, 37th revised edition, 2008.
6. Probability and Statistics by T.S.R. Murthy, I.K. International Publishing house Pvt. Ltd, 2012 edition.