AMCT07 PROBABILITY AND STATISTICS

UNIT-1 RANDOM VARIABLES

1.1 Discrete and Continuous random variables

1.2 Moments- Moment generating functions

1.3 Binomial, Poisson, Geometric, Uniform, Exponential, Gamma,

1.4 Weibull and Normal distributions

1.5 Functions of a random variable.

UNIT-2 TWO-DIMENSIONAL RANDOM VARIABLES

2.1 Joint distributions

2.2 Marginal and Conditional distribution- Covariance-

2.3 Correlation and Linear regression

2.4 Transformation of random variables-

2.5 Central limit theorem (for independent and identically distributed random variables).

UNIT-3 TESTS OF SIGNIFICANCE

3.1 Sampling distributions

3.2 Tests for single mean, proportion,

3.3 Difference of means (large and small samples)-

3.4 Tests for single variance and equality of variances – χ^2-test for goodness of fit

3.5 Independence of attributes

3.6 Non-parametric tests: Test for Randomness and Ranksum test (Wilcoxon test).

UNIT-4 DESIGN OF EXPERIMENTS

4.1 Completely randomized design

4.2 Randomized block design

4.3 Latin square design- 2^2- factorial design-

4.4 Taguchi's robust parameter design.

UNIT-5 STATISTICAL QUALITY CONTROL

5.1 Control charts for measurements (X and R charts)

5.2 Control charts for attributes (p, c and np charts)

5.3 Tolerance limits - Acceptance sampling.

References Books:

1. Devore, J.L., "Probability and Statistics for Engineering and the Sciences", Thomson Brooks/Cole, International Student Edition, New Delhi, 7th Edition, 2008.
2. Walpole, R.E., Myers, R.H., Myers, S.L. and Ye, K., "Probability and Statistics for Engineers and Scientists", Pearson Education, Asia, 8th Edition, 2007.
3. Ross, S.M., "Introduction to Probability and Statistics for Engineers and Scientists", Elsevier, New Delhi, 3rd Edition, 2004.