Vidyalankar

S.E. Sem. IV [ETRX]

Advanced Engineering Mathematics

SYLLABUS

Time : 3 Hrs. **Theory :** 100 Marks

1. **Random variables**
   1. Discrete and continuous random variable, Probability mass and density function for random variables.
   2. Expected value, Variance, Moments and moment generating functions.
   3. Relation between Raw and central moments.

2. **Probability distributions**
   1. Binomial, Poisson and Normal distribution.
   2. Introduction to distribution such as 't' and 'χ^2', central limit theorems and problems based on this theorem.

3. **Sampling theory**
   1. Large and small samples, Test of significance for both samples.
   2. Paired 't' test.
   3. Application for χ^2 distribution.

4. **Discrete structure**
   1. Relation and function (Equivalence relation, Injective, Surjective and Bijective functions)
   2. Poset, Lattice (Bounded, Complemented and Distributive lattice)
   3. Algebraic structure : Group, Ring, Field.

5. **Matrices**
   1. Cayley Hamilton theorem, eigen values and eigen vectors (without proof).
   2. Similar matrices, orthogonally similar matrices, reduction to the diagonal form.

6. **Complex Integration**
   1. Cauchy's theorem and Cauchy's integral formula.
   2. Taylor's and Laurent's formula, Singularities and poles.
   3. Residue theorem.

References :

1. Text book Applied Mathematics *(P.N. Wartikar/J.N. Wartikar)* Pune Vidyarthi Griha Prakashan
2. Theory of complex variable *(Shantinarayan)*
3. Engineering Mathematics *(S.S. Sastri)*
4. Fundamental of Mathematicals Statistics *(S.C. Gupta and V.K.Kapoor)*
5. Probability and Statistics, Schum Series)
6. Discrete Mathematics *(Kolman, Busby, Sharon Rus)*
7. Function of discrete Mathematics *(K.D.Joshi)*

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