Code :R7410208

| **R7** |

IV B.Tech I Semester(R07) Supplementary Examinations, May/June 2011
RELIABILITY ENGINEERING & APPLICATION TO POWER SYSTEMS
(Electrical & Electronics Engineering)

Time: 3 hours
Max Marks: 80

Answer any FIVE questions
All questions carry equal marks

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1. (a) What is meant by the probability density functions and a probability distribution functions? Discuss their properties.

   (b) The stator and rotor of an electric motor are manufactured in two different sections and then assembled together. The probability that the stator detective is 0.06 and the rotor defective is 0.09 what is the probability that the assembled motor is not detective? Derive the formulae used.

2. (a) Obtain an expression for reliability of a three component series and parallel system.

   (b) Explain what is meant by k-out-of n redundancy .

3. (a) Define the functions $f(t), f(t), h(t)$ *and* $R(t)$ and develop the relationship between them.

   (b) Derive the relationship between MTTF and R(t).

4. (a) Develop as expression for limiting state probability of a two component repairable system with identical transitional rates and identical capacities.

   (b) Explain the concept of stochastic transitional probability matrix.

5. Evaluate the cumulative probabilities and frequencies and equivalent transitional rates for three component repairable model using markov process.

6. Find the cumulative probability and cumulative frequency of a three unit generating systems having capacities of 20 units of 25 MW each and one with 50 MW, having a failure rate of 0.01 failures/day and repair rate of 0.49 repairs/day.

7. (a) Discuss about the reliability indices obtain used in bulk power transmission system.

   (b) Derive the expressions for probability and frequency of failures at a bus in composite power system.

8. Explain about the basic and performance probability indices of a radial distribution using necessary expressions.

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