Code: 9A10702

B.Tech IV Year I Semester (R09) Regular & Supplementary Examinations December 2015

RELIABILITY ENGINEERING

(Common to E.Con.E and EIE)

Time: 3 hours
Max. Marks: 70

Answer any FIVE questions
All questions carry equal marks
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1 (a) Derive an expression for expected value of a random event that follows binomial distribution.
   (b) There are three boxes A, B, C in which there are bulbs. There are 1000 bulbs in box A with 6% probability of defective ones, 1500 in box B with 7% and 2100 in box C with 4% defective ones respectively. Find the probability that the picked bulb is good.

2 (a) Derive symbolic unreliability expressions for parallel connected system with fully redundant configuration.
   (b) A system consists of two components when they are connected in series, the reliability of the combination is 0.54 and while they are in parallel, reliability is 0.96. Find the individual reliabilities of the components.

3 (a) Define basic time dependent probability functions and explain.
   (b) Show that reliability function is an exponentially decaying one with constant hazard rate model of the failure of the components.

4 (a) Develop the expressions for time dependant probabilities of states of one component repairable system.
   (b) Consider the one component repairable model with state transitions: from state 1 to state 2 is 0.2 and from state 2 to state 1 is 0.6. Develop the state transition diagram and hence obtain the state transition probabilities up to three intervals considering that the system is initially in state.

5 Give a brief notes on maintainability distributions.

6 (a) What is Terotechnology? Explain briefly.
   (b) Discuss about reliability centered maintenance.

7 Give the design considerations for maintainability.

8 Describe the importance of product knowledge and product reliability.

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