R09

Code No: 58017

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech IV Year II Semester Examinations, May - 2017
RELIABILITY ENGINEERING
(Common to EIE, BME, ECM)

Time: 3 Hours **Max. Marks: 75**

Answer any Five Questions
All Questions Carry Equal Marks
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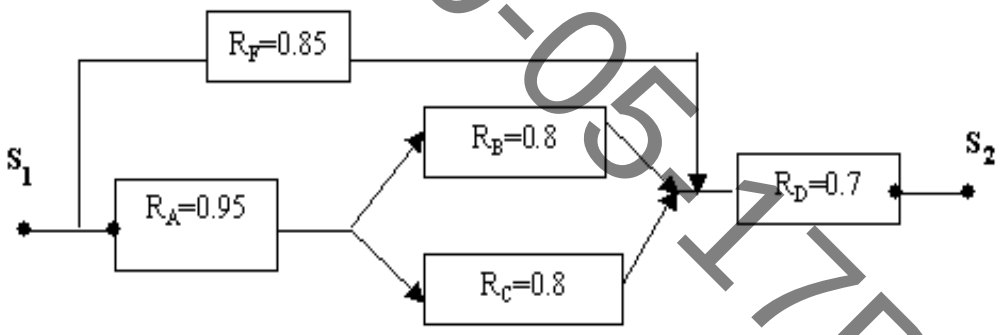
1.a) Explain probability density function and probability distribution function.
b) A die is thrown 6 times. Evaluate the probability of getting two spots on the upper face 0,1,2…,6 times and draw the probability density function and the probability distribution function. [7+8]

2.a) Explain the concept of hazard rate with examples.
b) Derive the expression for reliability in terms of hazard rate. [7+8]

3.a) Derive the expression for reliability evaluation of series and parallel systems.
b) Calculate the reliability for the system shown in Figure. [7+8]



4.a) Distinguish between Markov chain and Markov process.
b) The following Stochastic Transitional Probability Matrix P shows the transition states in per hour of a continuous Markov process

$$P = \begin{bmatrix} .90 & .05 & .05 \\ 0 & .95 & .05 \\ 0 & 0 & 1 \end{bmatrix}$$

i) Construct space diagram and discuss particular features of it.
ii) Evaluate MTTF given that system starts in state 1.
iii) Derive the differential equations of the system. [5+10]

5. Explain Tolerance Test Conditions and Tolerance of Instruments. [15]

6.a) Explain the methods for Accelerated Life Test (ALT) Data Quantifications.
b) Explain Stress Combinations in ALT. [8+7]

7.a) Explain Point and Interval Estimation
b) Write Properties of Estimators. [10+5]

8. Write short notes on
a) Exponential distribution.
b) Two component non-repairable system. [7+8]

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