Final Exam   Duration: 3 Hrs   Date: April 28, 2017   Max Marks: 50

1.   [4 + 8 = 12]

a. Explain NHPP models and its properties.

b. The failure time in operating days of a repairable system are as follows.

1.0, 4.0, 4.5, 92.0, 252.0, 277.0, 284.5, 374.0, 440.0, 444.0, 475.0, 536.0, 568.0, 744.0, 884.0, 904.0

Prepare a plot of ROCOF against time and offer your comments about the system.

2.   [5 + 5 = 10]

a. A mechanical system's MTTR is 3 hours. What is the probability that a repair will be completed in 4 hours, if the time to repair is exponentially distributed.

b. Assume that a system is composed of four repairable subsystems with respective failure rates 0.0015, 0.0023, 0.0031, 0.0038, 0.0042 failures per hour. The corresponding maintenance times of the sub systems are 0.5hr, 1.0hr, 1.5hr, 2.0hr and 2.5hr respectively. Calculate MTTR.

3.   [3 + 5 = 8]

a. Define availability.

b. Explain the importance of accelerated life testing. What are the commonly used relationship between failure rate and stress?

4.   [3 + 2 = 5]

a. What are the different components of repair cost?

b. What is the difference between reliability and maintainability?

5. Write short note on the following.   [3 x 5 = 15]

a. Stationary process

b. Warranty with storage limitation

c. Renewal process

d. ROCOF

e. Homogeneous poisson process