

# Indian Statistical Institute, Bangalore

M.S. (QMS) First Year

Second Semester - Reliability, Maintainability and Safety-II

Final Exam

Time: 3 hours

Date: 09/05/2022

Maximum Marks: 50

Answer all the questions

1. Obtain the reliability function for a stress strength model, assuming exponential distribution. Use usual notations and assumptions. [10]
2. A component has a strength which is normally distributed with a mean value of 5000N and a standard deviation of 400N. The load it has to withstand is also normally distributed with a mean value of 3500N and a standard deviation of 400N. What is the Reliability per load application? [5]
3. If the life time follows exponential distribution, write down the likelihood function for a progressive interval censoring scheme. [10]
4. Ten units were put on a life test until five failures were observed. The following failure times (in hours) were observed: 20, 35, 95, 40, 15. Suppose the lifetimes of the units follow exponential distribution. Find the maximum likelihood estimate (MLE) of the mean time to failure of the units. [10]
5. Write short note on the following
  - a. ROCOF
  - b. Accelerated Life Testing
  - c. NHPP Models[3x5 = 15]