APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

THIRD SEMESTER M.TECH DEGREE EXAMINATION, DECEMBER 2019

Mechanical Engineering (Thermal Engineering)

03ME 7013 Reliability Engineering Max. Marks: 60

Duration: 3 Hrs PART A ANSWER ALL QUESTIONS (4 x 5 = 20 Marks)

I. Distinguish the terms MTTF and MTBF with examples?

II. Derive expression for system reliability when the components are arranged in parallel in RBD

III. How do we compensate the availability of equipments when reliability cannot be improved?

IV. What are the general design guidelines for maintainability design

PART B (4 x 10 = 40 Marks)

V. The MTBF of equipment is 500 hours. What is the failure rate expressed in

a) Failures / hour
b) Failures / 10^6 hours
c) % failures / 1000 hours Is MTBF a guaranteed failure free period?

OR

VI How do we specify the reliability in electronic components? What are the ethical issues related to reliability design

VII Explain the significance of "The Weibul Model" in failure rate analysis

OR

VIII How do we obtain a bath tub curve related to hazard rate? Explain the three distinct stages in bath tub curve?

IX How software reliabilities are assessed? .How such studies help to improve software reliability

OR

X What are the different methods by which reliability can be improved? List and explain .

XI. What is de rating? How does it help to attain better reliability? What are the other design considerations of reliability?

OR

XII Why do we adopt the accelerated life testing in reliability analysis? Explain the process