

Roll No



**PRESIDENCY UNIVERSITY
BENGALURU**

SET A

**SCHOOL OF ENGINEERING
END TERM EXAMINATION – MAY / JUNE 2024**

Semester : Semester VIII - 2020

Course Code : MEC3015

Course Name : Reliability Engineering

Program : B.Tech.

Date : May 29, 2024

Time : 01.00pm to 04.00pm

Max Marks : 100

Weightage : 50%

Instructions:

- (i) Read all questions carefully and answer accordingly.
- (ii) Question paper consists of 3 parts.
- (iii) Scientific and non-programmable calculator are permitted.
- (iv) Do not write any information on the question paper other than Roll Number.

PART A

ANSWER ANY FIVE QUESTIONS

5QX2M=10M

1. What is Reliability Centered Maintenance?
(CO1) [Knowledge]
2. List the Cost Objectives of Maintenance.
(CO1) [Knowledge]
3. What is Parallel Forms Reliability method?
(CO2) [Knowledge]
4. What is Mean Failure Rate?
(CO2) [Knowledge]
5. What do you mean by System Reliability?
(CO3) [Knowledge]
6. Define Availability.
(CO4) [Knowledge]
7. What do you mean by Inherent Availability?
(CO4) [Knowledge]

PART B

ANSWER ANY FIVE QUESTIONS

5QX10M=50M

8. By implementing the Computers in Maintenance activities for an Indian Industry what are the benefits of computerization in Maintenance?
(CO1) [Comprehension]

9. What can MTBF tell you & How to improve MTBF? Discuss in detail (CO2) [Comprehension]
10. With an example discuss the Scheduled Downtime & Un-Scheduled Downtime (CO2) [Comprehension]
11. With an example explain how the Reliability of the series systems are calculated (CO3) [Comprehension]
12. Calculate the reliability of the following systems in which the probability of functioning of each component is given in the figure

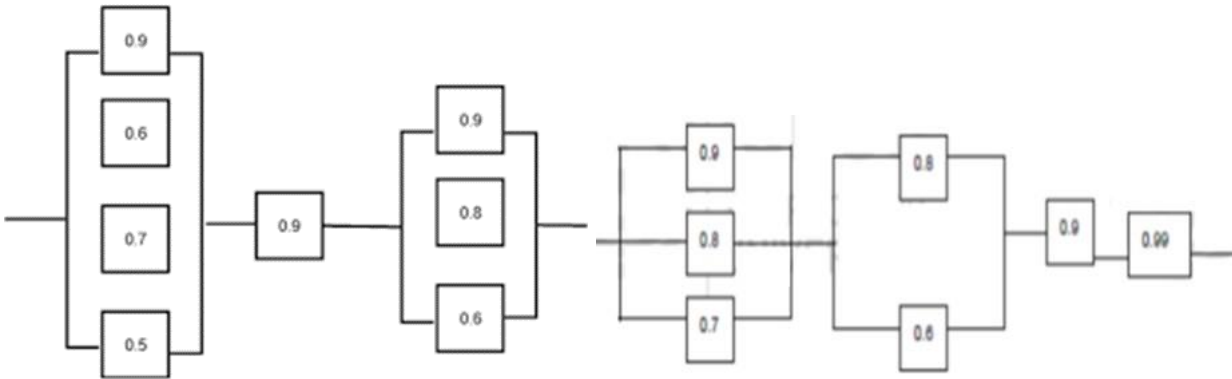


Figure (b)

Figure (a)

13. How the dependence of Availability on Reliability & Maintainability can be demonstrated by means of geometrical model? (CO4) [Comprehension]
14. What are all the factors which affects the Maintainability? Discuss in detail (CO4) [Comprehension]

PART C

ANSWER ANY TWO QUESTIONS

2QX20M=40M

15. How the implementation of Total Productive Maintenance & Total Quality Maintenance are helpful to the Industries? Explain with an example (CO1) [Application]
16. Consider a series of tests conducted under certain stipulated conditions on 500 electronic components. The total duration of the tests is 5 hours. The number of components that fail during each hourly interval is noted. The results obtained are shown in table below

Time	1	2	3	4	5
Number of Failures	140	115	93	84	68

Calculate 1) Failure Density, 2) Failure Rate 3) Reliability & 4) Probability of Failure

(CO2) [Application]

17. The reliabilities and corresponding costs of two sub components A and B of a system are given in the table. Find all possible system reliabilities and their costs. Give your comments to estimate the most optimal reliability for the system composed of two components A and B. Find the combination of components such that (a) reliability should not be less than 85% (b) cost should not be more than Rs. 150/-

Sub Component	Cost of Reliability		
	0.8	0.9	0.95
A	50	90	150
B	70	90	120

(CO3) [Application]