

B.E. Eighth Semester (Aeronautical Engineering) (C.B.S.)
Elective - I : Reliability Centered Maintenance

P. Pages : 2

Time : Three Hours



NKT/KS/17/7647

Max. Marks : 80

- Notes :
1. All questions carry marks as indicated.
 2. Solve Question 1 OR Questions No. 2.
 3. Solve Question 3 OR Questions No. 4.
 4. Solve Question 5 OR Questions No. 6.
 5. Solve Question 7 OR Questions No. 8.
 6. Solve Question 9 OR Questions No. 10.
 7. Solve Question 11 OR Questions No. 12.
 8. Due credit will be given to neatness and adequate dimensions.
 9. Assume suitable data whenever necessary.
 10. Diagrams and chemical equations should be given whenever necessary.
 11. Illustrate your answers whenever necessary with the help of neat sketches.
 12. Use of non programmable calculator is permitted.

1. Define 14
- a) failure density (fd) b) failure rate (λ)
- c) reliability (R)
- and calculate, 'fd', ' λ ' & 'R' for given data

<u>Time</u> (t)	<u>no. of failure</u>
0	0
1	120
2	85
3	71
4	62
5	53
6	45
7	41
8	37
9	35
10	29
11	50
12	45

OR

2. a) Define reliability and discuss in detail 6
- b) In test involving continuous satisfactory performance of 110 electronic instrument under excessive vibration condition, the following failure frequencies were observed, the total test period being 6 hrs. 8

time interval (t)	0 – 1	1 – 2	2 – 3	3 – 4	4 – 5	5 – 6
no : of failures	3	16	22	42	11	9

Calculate MTTF.

3. a) Draw and explain various phase of an Equipment Life Cycle. 8
b) Define stand-by redundancy with suitable example. 6

OR

4. Discuss reliability of system in 10
i) a) Series
b) Parallel
c) Series-Parallel
d) Parallel-Series
e) K out of m system
ii) Discuss stand by redundancy and it's types. 4
5. a) Explain about evolution of RCM from Beginning. 7
b) Explain: 6
i) Fault tree analysis
ii) Markov method
iii) Decomposition method

OR

6. Describe all the types of system Evaluation methods in detail. 13
7. Explain in detail about FMEA and How it is developed into FMECA. 13

OR

8. Describe failure & failure modes. Explain in detail about all categories of failure modes. 13
9. Describe about various maintenance policies in detail. 13

OR

10. Distinguish between proactive maintenance – predictive task & proactive maintenance - preventive task. 13
11. a) What is RCM and mention it's History from Beginning. 8
b) How RCM is usefull in various field? Explain with a proper example. 5

OR

12. Describe application of RCM in. 13
i) Airlines industry.
ii) Military
iii) Nuclear power industry.
