BACHELOR OF TECHNOLOGY IN MECHANICAL ENGINEERING (COMPUTER INTEGRATED MANUFACTURING)

Term-End Examination

June, 2013

BME-025 : CONDITION MONITORING AND MAINTENANCE ENGINEERING

Time : 3 hours   *Maximum Marks : 70*

Note : *Answer **any seven** questions. Use of calculator is permitted.*

1. (a) Differentiate between TPM and TQM. **2x5=10**

    (b) Explain the terms zero defects, zero breakdown with reference to TPM.

2. (a) Explain the 5-S frame work for work place organisation. **2x5=10**

    (b) Deduce the expression for the over all reliability of a circuit containing 'n' components connected in series.

3. (a) Find the reliability of the following combination of the components who's reliabilities are shown in the blocks of the diagram. **2x5=10**
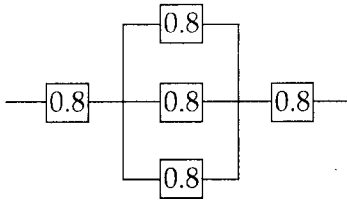
Figure - 1

(b) An old electronic system consists of five vacuum tubes whose MTBF is 10,000 hrs. Now, when the system is fitted with 20 IC'S, The MTBF increases to 80,000 hrs. Find the effect of the IC's on reliability of the system. If the transistors are used instead of IC'S we require 40 transistors.

Evaluate Reliability if the transistors can be used .

4. (a) What do you understand by maintenance strategies and objectives ? **2x5=10**

(b) What is terotechnology ? How is it related to maintenance management ?

5. The initial cost of equipment is Rs. 5000. The **10** running cost varies as given here.

Table

Year	1	2	3	4	5	6	7
Running Cost Rs.	400	500	700	1000	1300	1700	2100

allowing a discount rate of 10%, find optimal replacement interval

6. Distinguish between process FMEA and design **10** FMEA. Also Discuss the merits and demerits of FMEA.

7. A firm is thinking of replacing a particular **10** machine whose cost price is Rs. 12,200. The Scrap price of this M1 is only Rs 200/-. The maintenance cost are estimated to be as follows :

Table : 2

Year	1	2	3	4	5	6	7	8
Maintenance	220	500	800	1200	1800	2500	3200	4000

Determine when the firm should get the machine replaced.

8. What is codification ? What is its significance in **10** maintenance spare parts management ? What are the advantages of codification ?

9. Find the sequence that minimises total elapsed **10** time .

Tasks	A	B	C	D	E	F	G
Time in M_1	3	8	7	4	9	8	7
M_2	4	3	2	5	1	4	3
M_3	6	7	2	11	5	6	12

10. Write short notes on the following :   **2.5x4=10**

   (a)   Preventive maintenance

   (b)   V.E.D Analysis

   (c)   Kaizen

   (d)   Time based maintenance.

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