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BME-025

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BACHELOR OF TECHNOLOGY IN MECHANICAL ENGINEERING (COMPUTER INTEGRATED MANUFACTURING)

Term-End Examination

June, 2010

BME-025 : CONDITION MONITORING AND MAINTENANCE ENGINEERING

Time : 3 hours *Maximum Marks : 70*

Note : *Answer **any seven** questions. All questions carry **equal** marks. Use of calculators is allowed.*

1. "Plant Engg. serves and concerns for everyone in the organization". Support the statement in case of a large scale process industry with suitable examples. **10**

2. Classify various planned and unplanned maintenance strategies and describe central themes of at least five of them. **10**

3. The Railway department has planned six railway lines which must undergo three stages viz. Track laying, Jointing and Inspection. The process times in days are estimated as given below : **10**

Railway line no.	1	2	3	4	5	6
Track laying	18	12	29	36	43	37
Jointing	7	12	11	2	6	12
Inspection	19	12	23	47	28	36

(a) Determine the total elapsed time and the idle time of each line.

(b) Prepart Gantt Chart.

Assume all lines are taken up now and the waiting time is counted from the time it is taken up.

4. Write short notes with illustrative examples. **5+2+3**

(a) A-B-C Analysis.

(b) V-E-D Analysis

(c) C-I-N Analysis

5. List out the Non Destructive Tests (NDT) to estimate the condition of the equipment and explain any two of them in detail. **10**

6. Explain why Condition Based Maintenance (CBM) is called Dynamic Predictive Maintenance (DPM). Describe the four pillars of Dynamic Predictive Maintenance. **10**

7. An electric company which generates and distributes electricity conducted a study on the life of poles. The appropriate life data are given in the following table for ten years. **10**

Year after installation	1	2	3	4	5	6	7	8	9	10
Percent failed	1	2	3	5	7	12	20	30	16	4

(a) If the company now installs 5000 poles and follows a policy of replacing the poles only when they fail, how many poles are expected to be replaced each year during next ten years ?

(b) If the cost of replacing is Rs. 160/- per pole and if we have a common group replacement policy, it costs Rs. 30/- per pole. Find out the optimal period of group replacement.

8. Give the step by step general procedure in Reliability Centered Maintenance Modeling and Analysis. **10**

9. The probability of functioning of each element in a parallel system of four components is given as 0.6, 0.7, 0.8 and 0.9 respectively. Find the overall reliability of the system. What will be the change in the system reliability if the reliability of the third component is (a) increased to 0.9 (b) decreased by 0.1. Give your comments on variation in the system reliability. **10**

10. Distinguish between TQM and TPM. What are the barriers in implementing the TPM ? **10**