BACHELOR OF TECHNOLOGY IN MECHANICAL ENGINEERING (COMPUTER INTEGRATED MANUFACTURING)

Term-End Examination

December, 2012

BME-025 : CONDITION MONITORING AND MAINTENANCE ENGINEERING

Time : 3 hours　　　　　　*Maximum Marks : 70*

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

1. (a) Define and explain the term maintenance engineering. Also explain the objectives of maintenance management.

   (b) List the various functions of maintenance department. Briefly explain each one of them.　　　　　　　**2x5=10**

2. (a) What is maintenance planning ? Explain different stages involved in maintenance planning.

   (b) Discuss various types of maintenance strategies that are aimed to prevent the occurrence of failures.　　**2x5=10**

3. Distinguish between :   2x5=10

   (a) Productive maintenance and Predictive maintenance.

   (b) Planned maintenance and scheduled maintenance.

4. (a) There are 7 jobs each of which has to be done using M/C 1 and M/C 2 in order M1 and M2. Processing time (in hrs) are given below. Determine the sequence that will minimise the elasped time and prepare the time Schedule chart and Gantt chart :   2x5=10

Table : 1

Job	1	2	3	4	5	6	7
M1	3	12	15	6	10	11	9
M2	8	10	10	6	12	1	3

   (b) In a pipe fabrication shop, the time required for cutting and welding operation for 6 different sizes of pipes are given. Determine the order in which those pipes should be processed in order to minimise the total time for processing all the pipes :

Table : 2

Operation	1	2	3	4	5	6
Cutting time	3	12	5	2	9	11
Welding time	8	10	9	6	3	1

5. Find the sequence that minimises total elapsed **10** time. The data is :

Table : 3

Tasks	A	B	C	D	E	F
M1	4	9	8	5	10	9
M2	5	4	3	6	2	5
M3	7	8	6	12	6	7

6. (a) What is A-B-C Analysis ? Explain the step-by-step method to conduct the ABC Analysis.

   (b) What is standardisation ? Explain its significance in maintenance spare parts management. **2x5=10**

7. What is condition based maintenance (CBM) ? **10** What benefits are obtained by implementing a CBM system in any plant ?

8. Calculate the reliability of the following systems **10** in which the probability of functioning of each component is given in the figure itself.
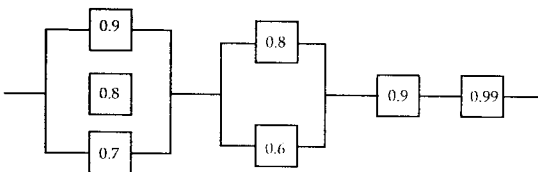

Figure : 1

9. (a) Define the term availability. Enumerate the factors affecting the availability of the equipment. **2x5=10**

(b) Define the term maintenability. List out the factors affecting the maintenability.

10. Write short notes on the following : **4x2.5=10**

(a) Total Productive Maintenance (TPM)

(b) Reliability

(c) Bath tub Curve

(d) Spare Parts Inventory Management

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