Printed Pages : 3

* 1 4 0 8 5 2 *

EME052

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 140852

Roll No.

B. Tech.

(SEM. VIII) THEORY EXAMINATION, 2014-15

MAINTENANCE ENGINEERING & MANAGEMENT

Time : 3 Hours] [Total Marks : 100

Note : Attempt all questions as per instructions.

1 Attempt any **four** questions : 5×4=20

(a) Define maintenance. What are its objectives?

(b) Explain about MTTF, MTBF.

(c) Explain reliability bath tub curve with example.

(d) What is maintainability? Discuss the principle of it.

(e) Write about operating life cycle with example.

(f) Write short note on hazard model.

2 Attempt any **two** questions. 10×2=20

(a) What do you mean by corrective and proactive maintenance? Also write short notes on vibration monitoring.

(b) What do you understand by total productive maintenance? What are the basic implementation steps to achieve it?.

(c) Differentiate: I. Abrasive and adhesive wear, 2. Splash, circulating lubrication.

3 Attempt any **two** questions. **10×2=20**

(a) A machine X costs Rs. 5000. Its maintenance cost is Rs. 1000 in each of the first four years and then it increases by Rs. 200 every year. Assuming that the machine has no salvage value and the maintenance cost is incurred in the beginning of each year, determine the optimal replacement time for the machine assuming that the time value of money is 10 % p.a.

(b) A truck owner finds from his past records that the maintenance costs Rs. 200 for the first year and then increases by Rs. 2000 every year. The cost of the truck type A is Rs. 9000. The best age at which to replace the truck. Truck B type costs Rs. 10000. Annual maintenance costs are Rs. 400 and increases by Rs. 800 every year.

(c) Explain group replacement policy for non-repairable items.

4 Attempt any **two** questions. **10×2=20**

(a) Explain the Hungarian Assignment Method to find out optimal solution to an assignment problem.

(b) What factors affect maintenance during specifications, design, manufacturing, commissioning and operations? Explain them all.

(c) The activities in a PERT project are given in the table below :

Activity		Duration (days)		
		a	m	b
A	1-2	2	6	10
B	1-3	14	10	30
C	2-4	12	6	12
D	3-5	3	18	3
E	3-6	4	8	6
F	5-7	4	6	8
G	6-7	3	6	15
H	7-8	2	5	14
I	4-8	2	5	8

a = optimistic time, m = most likely time, b = pessimistic time

(i) Draw a network diagram using the above data.

(ii) Calculate the earliest and latest event times for all nodes and find the critical path.

(iii) Find the probability of completing the project before 36, after 40 days.

What impact do you think will be there on the critical path if the most likely time of activity F is changed to 12 from 6 days?

5 **Attempt any two questions.** **10×2=20**

(a) **Discuss the method and importance of spare parts planning in maintenance.**

(b) What are the objectives and functions of maintenance management?

(c) How the cost analysis of a typical maintenance department is carried out?