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EME052

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

PAPER ID : 2985 Roll No.

B.Tech.

(SEM. VIII) EVEN THEORY EXAMINATION 2012-13

MAINTENANCE ENGINEERING AND MANAGEMENT

Time : 3 Hours *Total Marks : 100*

Note :– (1) Attempt **all** questions.

(2) Be precise in your answers.

1. Attempt any **four** parts of the following : **(5×4=20)**

(a) What is maintenance ? What are its benefits ?

(b) Write a short note on operating life cycle with suitable example.

(c) What is maintainability ? Discuss the principle of maintainability.

(d) An aircraft has four independent, active and identical engines. At least two of the engines must operate successfully for the aircraft to fly successfully. The constant failure rate of each engine is 0.009 failures/h. Compute the reliability of the aircraft for a seven-hour flying mission.

(e) Explain reliability bath tub curve with suitable example.

(f) Explain following terms :

(i) MTBF

(ii) MTTF

(iii) MTTR.

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2. Attempt any **four** parts of the following : **(5×4=20)**

(a) Explain, how preventive maintenance policy differs from repair policy.

(b) What is predictive maintenance ? Discuss its various techniques.

(c) Explain planned lubrication. Discuss various methods for carrying out planned lubrication.

(d) What do you understand by 'Total Productive Maintenance' ? What are the basic implementation steps to achieve it ?

(e) What are the requirements so as to achieve zero breakdown ?

(f) What is designed out maintenance ? Explain.

3. Attempt any **two** parts of the following : **(10×2=20)**

(a) Explain replacement policy for equipment which deteriorates gradually considering time value of money.

(b) The cost of a machine is Rs. 6,100 and scrap value is Rs. 100. The maintenance cost found from experience is as follows :

Year	1	2	3	4	5	6	7	8
Maintenance cost (Rs.)	100	250	400	600	900	1200	1600	2000

When should the machine be replaced ?

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

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4. Attempt any **two** parts of the following : **(10×2=20)**

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

(b) In factory the machines breakdown on an average rate of 10 machines per hour. The idle time cost of machine is estimated to be Rs. 20 per hour. The factory works for 8 hours a day. The factory manager is considering 2 mechanics for repairing the machine. The mechanic A takes 5 min. to repair a machine and demands Rs. 10 per hour. The second mechanic B takes 4 min. in repairing the machine and demands Rs. 15 per hour. Which of the two mechanics will be preferred ?

(c) Elaborate the following :

(i) Hungarian Assignment Method

(ii) PERT and its relevance in network analysis.

5. Attempt any **four** parts of the following : **(5×4=20)**

(a) What are the objectives and function of maintenance management ?

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

(c) Explain objective criteria of evolution of maintenance management.

(d) Write short note on maintenance policies

(e) Discuss the importance of manpower planning in maintenance.

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