Printed Pages—4 EME052

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

PAPER ID : 2985 Roll No.

B.Tech.

(SEM. VIII) THEORY EXAMINATION 2011-12

MAINTENANCE ENGINEERING AND MANAGEMENT

Time : 3 Hours *Total Marks : 100*

Note :—Attempt **all** questions.

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

   (a) Explain the operating life cycle taking the example of radio and transistor.

   (b) How does reliability helps in performance of maintenance function ?

   (c) Explain the following briefly :

      (i) Redundancy

      (ii) Availability

      (iii) Maintainability.

   (d) A system is composed of 5 identical independent elements in parallel. What should be the reliability of each element to achieve a system reliability of 0.96 ?

   (e) A five-component system is connected as shown in figure. Draw logic diagram for evaluating the system reliability. If all the components are identical and independent with a reliability of 0.8, determine the system reliability.

   (f) What do you understand by Failure rate curve ?

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

   (a) Do maintenance management principles have any relevance in the service industry ?

   (b) What do you understand by break down maintenance ? Discuss the various features of breakdown maintenance management ?

   (c) How is preventive maintenance different from break down maintenance ?

   (d) What is the need for better maintenance ? What are the elements of maintenance planning ?

   (e) What are the responsibilities of maintenance planning and scheduling ?

   (f) What do you understand by the term 'Total Productive Maintenance' ? What are the main features of Total Productive Maintenance ?

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

   (a) Explain how the theory of replacement is used in the following problems :

      (i) Replacement of items whose maintenance cost varies with time ?

      (ii) Replacement of items that completely fail ?

(b) In what kind of situation will 'group replacement' find an application ?

(c) Suppose a special purpose type of light bulb never lasts longer than two weeks. There is a chance of 0.3 that a bulb will fail at the end of the next week. Initially there are 100 new bulbs. The cost per bulb for individual replacement is Re. 1 and the cost per bulb for a group replacement is Re. 0.50. Is it cheapest to replace all bulbs :

(i) Initially,

(ii) Every week,

(iii) Every second week

(iv) Every third week ?

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

(a) Can there be multiple optimal solutions to an assignment problem ? How to identify such situations ?

(b) Explain PERT and its importance in network analysis. What are the requirements for application of PERT techniques ?

(c) Discuss the various features of breakdown maintenance planning ? What are the reasons for breakdown maintenance ?

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

(a) What is the objective of Manpower Planning ?

(b) Do maintenance management principles have any relevance in the service industry ?

(c) Does maintenance management differ from Production management ? If yes, in what way ?

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

(e) In a computerized inventory system, what are the typical data files and what kind of output reports generated ?

(f) What are typical down time costs which are associated with breakdown ?