(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 ?