

Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech. (Civil Engg./Mechanical Engg.) (Sem.-6)

MAINTENANCE AND RELIABILITY

Subject Code : BTME-617-18

M.Code : 79662

Date of Examination : 18-07-22

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write briefly :

- (a) Define breakdown maintenance. Why it's not suitable for critical components?
- (b) Define planning for maintenance.
- (c) Explain briefly, Cost of equipment v/s cost of replacement.
- (d) What is life cycle cost?
- (e) How Maintenance Record keeping can help to check impending failure?
- (f) Define the concept of system reliability.
- (g) How Reliability estimation can help to reduce Production cost?
- (h) What is maintainability and how the maintainability is improved?
- (i) Differentiate briefly between tie set and cut set methods of fault tree analysis.
- (j) How spare parts management is important to ensure system reliability?

SECTION-B

2. Write a note on various Maintenance Performance measuring parameters/indices.
3. Describe the need of maintenance planning for a production system and identify the benefits of effective maintenance.
4. A particular machine has a constant failure rate of $\lambda = 0.02$ hrs.
 - (a) What is the probability that it will fail within first 10 hours?
 - (b) Suppose that the machine has successfully operated for 100 hrs, what is the probability that it will fail during the next 10 hours of operation.
5. Write difference between MTTF and MTBF with suitable examples.
6. What is Total Productive Maintenance? Explain prerequisite for implementing TPM in any organization.

SECTION-C

7. What do you understand by diagnostic maintenance? How it can be applied to Railways? Discuss.
8. Define the concept of Failure Tree Analysis (FTA). Explain the key elements and steps involved in FTA. State some applications/uses of FTA.
9.
 - a) An electronic equipment is operated by six dry cells, each giving 1.5volts. The cells are connected in series. The probability of the successful operation of the cells under given operating conditions is 0.7, 0.6, 0.8, 0.9, 0.85 and 0.75, respectively. Calculate the reliability of the power system.
 - b) How reliability can be incorporated in the design of equipment/system? Explain.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.