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**Reg. No. :**

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**Question Paper Code: 59719**

B.E. / B.Tech. DEGREE EXAMINATION, APRIL 2019

Elective

Mechanical Engineering

15UME919 - MAINTENANCE ENGINEERING

(Regulation 2015)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

- The time elapsed from the point the machine fails to perform its function to the point it is repaired and brought into operating condition is known as CO1- R  
(a) Down time    (b) Break Down time    (c) Both (A) and (B)    (d) Idle time
- Calculate the failure rate of a component from the following data: CO1- R  
Number of component tested = 750, Period of time = 1000hrs, No. of failures reported for the given period of time = 5.  
(a)  $6.67 \times 10^{-5}$  fail/hr    (b)  $6.67 \times 10^{-6}$  fail/hr    (c)  $5.67 \times 10^{-5}$  fail/hr    (d)  $5.67 \times 10^{-6}$  fail/hr
- Total Productive maintenance (TPM) approach has the potential of providing almost a seamless integration between CO2- U  
(a) Production and Quality    (b) Quality and Maintenance  
(c) Production and Maintenance    (d) All of the above
- With the increase in preventive maintenance cost, breakdown maintenance cost CO2- R  
(a) Increases    (b) Decreases    (c) Remain same    (d) Any of the above
- Materials used for RTDs are CO3- R  
(a) Nickel    (b) Tungsten    (c) Copper    (d) All the above

6. Energy Dispersive X-ray analysis (EDX) related to CO3- R  
 (a) Power (b) Wear (c) Torque (d) Roughness
7. Failure Model and Effects Analysis includes CO4- R  
 (a) System& Design (b) Service (c) Processes (d) All the above
8. The general failure mode in the gears are CO4- R  
 (a) Fatigue (b) Wear (c) Stress rupture (d) All of the above
9. Major stages in preventive maintenance of material handling equipments CO5- R  
 (a) Inspection (b) Repair (c) Overhaul (d) All the above
10. The primary objective of a material handling system is CO5- R  
 (a) Reduce the unit cost of production (b) Maintain cycle time  
 (c) Increase the inventory (d) Increase the damage

PART – B (5 x 2= 10 Marks)

11. What is meant by MTBF and MTTR? CO1-R
12. Define the term Preventive Maintenance? CO2- R
13. What is the use of correction monitoring? CO3- R
14. What are the methods for fault location? CO4- R
15. Define the term Computerized Maintenance Management System (CMMS). CO5- R

PART – C (5 x 16= 80 Marks)

16. (a) What are the objectives of maintenance organization and what different types of organizations are in use in Indian industries? CO1- U (16)
- Or
- (b) What do you mean by maintenance job planning? Discuss various steps of maintenance job planning. CO1- U (16)

17. (a) Distinguish between fixed time maintenance and connect based maintenance. Give the merits and demerits. CO2- U (16)
- Or
- (b) Briefly explain the procedure for TPM. CO2- U (16)
18. (a) What is leakage monitoring? Explain some of the leakage mediums used for condition monitoring. CO3-U (16)
- Or
- (b) What is thermal monitoring and what thermal monitoring are used in industries. Explain principles and uses of thermograph. CO3-U (16)
19. (a) Briefly explain the procedure for the repair cycle of gears and lead screw. CO4-U (16)
- Or
- (b) Explain the logical fault location methods. CO4-U (16)
20. (a) Explain various hydraulic and pneumatic equipment used in material handling purpose. CO5- U (16)
- Or
- (b) Explain repair methods of Material Handling Equipments . CO5- U (16)

