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**Reg. No. :**

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**Question Paper Code: 99718S**

B.E./B.Tech. DEGREE EXAMINATION, APRIL 2024

Elective

Mechanical Engineering

**19UME918- MAINTENANCE ENGINEERING**

(Regulations 2019)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. What is the third phase of equipment life cycle? CO1 - U  
(a) Intrinsic (b) Design defect  
(c) Wear out failure (d) None of the above
  
2. A systematic approach for maintenance is CO1 - U  
(a) Problem – Cause – Diagnosis – Rectification  
(b) Problem– Diagnosis – Cause – Rectification  
(c) Problem – Measure – Diagnosis – Rectification  
(d) Problem– Diagnosis – Measure – Rectification
  
3. With the increase in cost of preventive maintenance, the breakdown maintenance cost will \_\_\_\_\_ CO1 - U  
(a) Decrease (b) Increase at faster rate  
(c) No charge (d) Increase
  
4. lubricant oil is needed to run the machine \_\_\_\_\_ CO1 - U  
(a) Quickly (b) With increased friction  
(c) With cleanliness (d) Without noise

5. Pistol thermometer used to capture a CO1 - U  
 (a) Digital photographic image as a pressure value  
 (b) Digital photographic image as a velocity value  
 (c) Digital photographic image as a temperature value  
 (d) Digital photographic image as a resistance value
6. Which condition monitoring technology is not used to identify CO1 - U  
 problems with bearings  
 (a) Vibration analysis (b) Shock pulse method  
 (c) Thermography (d) Acoustic leakage monitoring
7. The failure rate is also known as CO1 - U  
 (a) Safety rate (b) Hazardous rate  
 (c) Defect rate (d) Distortion rate
8. Why failure occurs in bearing? CO1 - U  
 (a) Proper bearing selection (b) Improper lubrication  
 (c) Proper mounting (d) Sufficient lubricant quantity
9. Fork lifttruck is used for CO1 - U  
 (a) liftingandlowering (b) vertical transportation  
 (c) both (a) and (b) (d) None of the above
10. The following is used to transport materials having flat bottoms CO1 - U  
 (a) Belt conveyor (b) Roller conveyor  
 (c) Chain conveyor (d) None of the above

PART – B (5 x 2= 10Marks)

11. State the components of maintenance cost. CO1 - U
12. Name the five S principles used for implementations of TPM CO1 - U
13. What are three types of condition monitoring? CO1 - U
14. List out the steps of Event Tree Analysis (ETA) CO1 - U
15. Mention the use of work order backlog. CO1 - U

PART – C (5 x 16= 80Marks)

16. (a) Demonstrate how objectives and principles of planned maintenance leading to low maintenance cost? CO2 - U (16)
- Or
- (b) Discuss and choose a type of maintenance organization model among the two types of maintenance organization model with neat sketch. CO2 - U (16)
17. (a) Explain the Breakdown Maintenance with flow diagram. CO3 - U (16)
- Or
- (b) Explain the any two Scheduling Techniques with suitable examples. CO3 - U (16)
18. (a) What is the principle and uses of thermograph used in industries? How do you analyze thermographs obtained in thermal power station? CO4 - U (16)
- Or
- (b) Briefly explain the basic steps in conditional monitoring CO4 - U (16)
19. (a) Analysis the various repair methods of machine slide ways and spindles CO5 - U (16)
- Or
- (b) State and draw the various fault tree diagram and reliability block diagram. CO5 - U (16)
20. (a) List various Hydraulic and Pneumatic equipment used in material handling purposes. How to maintain it? CO6 - U (16)
- Or
- (b) Examine the preventive maintenance strategies for Conveyors. CO6 - U (16)

