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Question Paper Code	12608
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B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2024

Seventh Semester

Mechanical Engineering

20PROE907 - TESTING OF MATERIALS

Regulations - 2020

Duration: 3 Hours

Max. Marks: 100

PART - A (10 × 2 = 20 Marks)

Answer ALL Questions

- | | Marks | K-
Level | CO |
|---|-------|-------------|-----|
| 1. What are the benefits of testing? | 2 | K1 | CO1 |
| 2. Explain the testing standard organization followed in India. | 2 | K2 | CO1 |
| 3. What are various failure modes of materials? | 2 | K1 | CO2 |
| 4. What kind of indenter suitable for Vickers hardness? | 2 | K1 | CO2 |
| 5. Explain aids used for visual testing. | 2 | K2 | CO3 |
| 6. What is the principle of working in acoustic emission test? | 2 | K1 | CO3 |
| 7. What is the need for material characterization? | 2 | K1 | CO4 |
| 8. State the principle of SEM. | 2 | K1 | CO4 |
| 9. Define thermal analysis. | 2 | K1 | CO5 |
| 10. What are the purposed of chemical analysis? | 2 | K1 | CO5 |

PART - B (5 × 13 = 65 Marks)

Answer ALL Questions

- | | | | |
|--|----|----|-----|
| 11. a) Summarize the steps to be followed during selection of materials. | 13 | K2 | CO1 |
| OR | | | |
| b) Explain in detail about the testing organizations & its committee with suitable example. | 13 | K2 | CO1 |
| 12. a) Explain the working principle of the machine used for tension test. What care should be taken while performing a test on UTM? | 13 | K2 | CO2 |
| OR | | | |
| b) Summarize with neat sketch, explain the various stages of creep. | 13 | K2 | CO2 |
| 13. a) Explain the penetration test with step process and its application. What are the various advantages and disadvantages? | 13 | K2 | CO3 |
| OR | | | |
| b) Summarize the working principle of radiography testing with suitable diagram. | 13 | K2 | CO3 |

14. a) Explain with suitable sketch, principle, and working of TEM analysis. 13 K2 CO4

OR

b) What are the different types of spectroscopy? Explain in detail about UV Spectroscopy with its advantages and disadvantages. 13 K2 CO4

15. a) Explain differential scanning calorimetry with its working principle and limitations. 13 K2 CO5

OR

b) Explain the various loading conditions in thermo mechanical analysis. 13 K2 CO5

PART - C (1 × 15 = 15 Marks)

16. a) In the construction site of steel cell phone tower, the quality engineers need to check the bolt quality for connection purpose. What test can be used for checking bolt that is used in connection? Explain the experimental procedure with its advantages and limitations. 15 K2 CO2

OR

b) Choose a suitable case study on material characterization using SEM analysis. 15 K3 CO4