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Question Paper Code: 92014

M.E. DEGREE EXAMINATION, OCTOBER 2014.

Elective

CAD / CAM

01PCD524 – MATERIAL TESTING AND CHARACTERIZATION

(Regulation 2013)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions.

PART A - (10 x 2 = 20 Marks)

1. What is basic principle of optical microscopy?
2. What do you mean by quantitative metallography?
3. Define Bragg's law.
4. Write down the applications of electron diffraction method.
5. Mention any four applications of TEM.
6. What are imaging modes available in an AFM?
7. What are the different types of hardness methods?
8. What are the difference between Charpy & Izod impact test?
9. List out the stages developed in fatigue and fracture mechanics.
10. What are the applications of dynamics tests?

PART - B (5 x 14 = 70 Marks)

11. (a) Write brief notes on the following optical microscopy techniques:
 - (i) Specimen preparation techniques. (7)
 - (ii) Polarization techniques. (7)

Or

- (b) What are the different engineering materials? Discuss briefly about the steels with related to microstructure? (14)

12. (a) Explain the working principle of X-ray diffraction technique with suitable sketch. (14)

Or

(b) Discuss in detail about the analysis of diffraction patterns. (14)

13. (a) Discuss the following TEM techniques:

(i) Specimen preparation techniques. (7)

(ii) Imaging techniques. (7)

Or

(b) Explain the working principle of scanning electron microscopy with a neat sketch. (14)

14. (a) What are the different testing methods for hardness? Explain any two methods? (14)

Or

(b) Which technique is used for measurement of ductility of materials? In what way ductility connected to the toughness of the material? (14)

15. a) What is the basis of the stress-life method in a material? Explain with suitable diagram. (14)

Or

(b) Describe the creep tests and creep curve with suitable sketch. (14)

PART - C (1 x 10 = 10 Marks)

16. (a) Give a short note on the use of X-ray diffraction technique in a metal matrix composites. (10)

Or

(b) How can you use the AFM for particulate reinforced polymer composites? Explain. (10)