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**Question Paper Code: 22013**

M.E. DEGREE EXAMINATION, MAY 2014.

Second Semester

CAD / CAM

01PCD 203 - APPLIED MATERIALS ENGINEERING

(Regulation 2013)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions.

PART A - (10 x 2 = 20 Marks)

1. Give examples for real crystals.
2. Differentiate: True Strain and Engineering Strain.
3. What are the factors that affect fatigue properties of metallic components?
4. Write down the Paris law for crack growth rate.
5. Name any two Electron Microscopes.
6. List out the principal components of Atomic Force Microscope.
7. What are the primary objectives of conducting a Tensile Testing?
8. What do you mean by Fatigue?
9. What is a Shape Memory Alloy (SMA)?
10. List out any two industrial application of nano materials.

PART - B (5 x 14 = 70 Marks)

11. (a) Explain the mechanism of plastic deformation of low carbon steel. (14)

Or

(b) Write short notes on:

(i) Super Plasticity (7)

(ii) Grain Boundary Strengthening. (7)

12. (a) (i) Explain the Griffith's Theory of brittle fracture. (10)

(ii) What are the differences between ductile and brittle failure? (4)

Or

(b) Explain any one mechanism of crack propagation study. (14)

13. (a) Explain the basic principle of Optical Microscopy. Also discuss the limitations of Optical Microscopy. (14)

Or

(b) (i) Explain the specimen preparation procedure for material characterization using SEM. (4)

(ii) Explain the working principle of Scanning Electron Microscope (SEM). (10)

14. (a) Describe the procedure of tensile test for metals. (14)

Or

(b) Discuss the procedure to select the material for

(i) Automobile applications and (7)

(ii) Marine applications. (7)

15. (a) What do you mean by Composite Materials? List the various advantages of Composite Materials over the Conventional materials. Also discuss the various types of Composite Materials. (14)

Or

(b) Write short notes on:

(i) Tungsten Carbide (7)

(ii) Silicon Carbide. (7)

PART - C (1 x 10 = 10 Marks)

16. (a) “Composite Materials have widespread applications in aircraft and spacecraft structures”. Justify this statement with a brief discussion. (10)

Or

(b) What are nano materials? List out any four nano materials. What is the significance of nano materials in industrial applications? (10)

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