

Reg. No. :

--	--	--	--	--	--	--	--	--	--

Question Paper Code: 12413

M.E. DEGREE EXAMINATION, MAY 2015.

Fourth 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 perfect crystals.
2. Define super plasticity.
3. List the toughening mechanisms.
4. Write down the Paris law for crack growth rate.
5. Define Bragg's law.
6. List out the principal components of scanning electron microscope.
7. What are the primary objectives of conducting a fracture test?
8. What do you mean by creep?
9. What is the difference between HSLA and TRIP steel.
10. List out any two industrial application of nano materials.

PART - B (5 x 14 = 70 Marks)

11. (a) Explain in detail about grain boundary strengthening? (14)

Or

(b) Explain in detail about the effect of temperature, strain and strain rate in plastic behaviour? (14)

12. (a) (i) Explain the Griffith's Theory of brittle fracture in detail. (14)

Or

(b) Explain in detail about the effect of surface and metallurgical parameters on fatigue. (14)

13. (a) Explain the basic principle of AFM. Also discuss the advantages of AFM. (14)

Or

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

(ii) Explain the working principle of Transmission Electron Microscope (TEM). (10)

14. (a) Describe the procedure of torsion and bending test for metals. (14)

Or

(b) Discuss the procedure to select the material for

(i) Aerospace applications (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) Discuss the advantages of using nano materials in industrial applications. (10)

Or

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