

Register Number:

M.E DEGREE EXAMINATIONS: JUNE 2012

Second Semester

CAD/CAM

CCM506: Applied Materials Engineering

Time: Three Hours

Maximum Marks: 100

Answer all the Questions:-

PART A (10 x 2 = 20 Marks)

1. Define grain boundary.
2. What are dislocations?
3. Give the critical stress required for crack propagation in a brittle material
4. State the Paris law.
5. Define Strength of a material.
6. Give any two examples of tough materials
7. What do you mean by transformation induced plasticity steel?
8. Give the properties of Shape Memory Alloys.
9. Define a polymer.
10. Give any two examples of natural polymeric materials.

PART B (5 x 16 = 80 Marks)

11. a) Explain dislocation and plastic deformation in detail.

(OR)

- b) Explain the strengthening mechanism of metal by

- (i) Grain size reduction (8)
- (ii) Solid solution (8)

12. a) (i) Briefly explain Larson-Miller parameter (4)
(ii) Briefly explain rupture, intergranular and transgranular creep fracture. (12)

(OR)

- b) Give in detail, a general failure analysis procedure

13. a) Explain any four mechanical properties of metals in detail.

(OR)

- b) Perform a case study in the selection of materials for a bicycle

14. a) Give the composition, properties and applications of the (i) Dual Phase, (ii) Micro alloyed and (iii) High strength low alloy steel.

(OR)

b) Explain the properties and applications of (i) Piezoelectric materials and (ii) shape memory alloys (12)

(iii) Write short notes on nano crystalline materials (4)

15. a) Give the structure, properties and applications of any two engineering polymers.

(OR)

b) Give the properties, processing and applications of any two advanced structural ceramics.
