Reg. No. : | | | | | | | | | | | |

K 6068

M.E. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2007.

Second Semester

CAD/CAM

CM 1601 — APPLIED MATERIALS ENGINEERING

(Regulation 2005)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Distinguish between elasticity and plasticity

2. What is the difference between perfect crystal and real crystal?

3. Define Stress intensity factor and what is its significance.

4. How does a fractured surface differ in ductile fracture and brittle fracture?

5. Name two alloys that are used in nuclear applications.

6. List any four factors that are considered for selection for materials.

7. What are dual phase alloys?

8. What are the uses of metallic glasses?

9. What makes the non metallic materials to be used in structural applications?

10. Name the techniques used for production of foams.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Explain the elasticity behavior in metals and polymers and state their significance. (8)

(ii) Discuss the role of dislocations in plastic deformations. (8)

Or

(b) (i) Write short notes on work hardening and solid solution strengthening. (8)

(ii) Explain the effect of temperature and strain rate on plastic behaviors. (8)

12. (a) Explain the method of determination of static fracture toughness of high strength steels with a neat illustration and relevant sketches (16)

Or

(b) Distinguish between the following

(i) High cycle and low cycle fatigue (8)

(ii) Ductile fracture and Brittle fracture (8)

13. (a) Why are materials selected based on fracture toughness rather than yield strength? State its significance with relevant examples and illustration. (16)

Or

(b) Write short notes on the following

(i) Importance of corrosion on selection of materials (8)

(ii) Significance of Wear resistance in materials (8)

14. Write short notes on the following :

(a) (i) Micro alloyed steels ;

(ii) TRIP steels (8 + 8)

Or

(b) (i) Smart Materials;

(ii) Shape Memory steels. (8 + 8)

5. (a) List the production techniques of making foams and illustrate any on of them in detail. (16)

Or

(b) Discuss the various properties and applications of the following:

(i) WC,

(ii) TIC,

(iii) SIC and

(iv) CBN. (16)
