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Question Paper Code : 81191

M.E. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2013.

First Semester

Computer Integrated Manufacturing

CI 9211/CI 911 — APPLIED MATERIALS ENGINEERING

(Common to M.E. CAD/CAM)

(Regulation 2009)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is deformation twinning?
2. Define superplasticity.
3. What is fatigue strength?
4. What is the principle of fracture mechanics?
5. How does hardness relate to toughness?
6. When would you use creep strength as a basis for structural design?
7. How to evaluate a casting process?
8. What is malleable iron?
9. List the application of HSLA steels?
10. What are nano sized materials?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Describe in detail how plastic deformation occurs by the motion of edge and screw dislocation in respect to applied shear stresses. (8)
(ii) Define slip system and discuss in detail slip in single crystal. (8)

Or

- (b) (i) Discuss on work hardening and solid solutionizing. (8)
- (ii) Discuss the effect of temperature, strain and strain rate on plastic behaviour. (8)

- 12. (a) (i) Describe the mechanism of crack propagation in both ductile and brittle modes of fracture. (8)
- (ii) Explain ductile to brittle transition in steel. (8)

Or

- (b) (i) Discuss on low cycle fatigue and high cycle fatigue. (8)
- (ii) What is the procedure for failure analysis? (8)

- 13. (a) Discuss the properties that must be reviewed when making material selection? What are the differences among the property of stiffness, strength and toughness. (16)

Or

- (b) Discuss the important properties to be considered for materials in automotive and marine applications. (16)

- 14. (a) Discuss the weldability of Aluminium and its alloys. (16)

Or

- (b) Describe in detail the process induced defects. (16)

- 15. (a) (i) What are Dual Phase Steels? List its applications. (8)
- (ii) What is the composition of Maraging steels? List its applications. (8)

Or

- (b) (i) Brief on the Shape Memory Alloys. (8)
- (ii) What is PVD process? Discuss on its application. (8)