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V 4248

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2008.

Eighth Semester

Mechatronics Engineering

MH 1005 — RAPID PROTOTYPING

(Regulation 2004)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. 'Product development team is cross - functional' – Explain with any two factor.

2. List any four major characteristics common for all products.

3. How are RP manufacturing systems classified?

4. What are the specific advantages laser in RP technology?

5. List the process parameters in fusion deposition modeling (FDM) influence on prototype quality.

6. Enumerate limitations of laminated object manufacturing.

7. State the reasons why solid ground curing method is not widely practised.

8. List the expected defects in RP by 'Thermojet printing method.

9. Explain the applications of object Quadra system.

10. What do you mean by 'near-net-shaping'? Explain.

PART B — (5 × 16 = 80 marks)

11. (a) Explain the process, principle, applications and limitations of Direct metal laser sintering system.

Or

(b) Discuss on, with suitable sketch, the process of making a prototype a novel mobile phone panels. Select suitable process.

12. (a) Assuming, two-wheeler petrol tank as a prototype model, with suitable flow charts, explain how it can be developed. The new tank is expected to have novel shape and novel features.

Or

(b) (i) What are the needs time compression is product incubation time?

(ii) Explain how conceptual design is carried out from forecasting and customer needs.

13. (a) Explain, following procedural steps, how a prototype of a proposed steering wheel of a car, can be made by FDM process.

Or

(b) Discuss on the method, principle, advantages and applications of laminated manufacturing technique. Draw suitable sketches.

14. (a) Explain, with suitable example as prototype, the principle, application of solid ground curing technique.

Or

(b) Make a table and compare the process parameters and their influence on product quality for the processes such as LOM, 3-dimensional printing, Thermojet printing and selective laser sintering method.

15. (a) (i) Explain 'LENS' in RP technology. What are its applications? (6)

(ii) Discuss on 'Rapid manufacturing', and its requirements. (6)

(iii) List the different types of softwares used in RP and their application. (4)

Or

(b) (i) Having, human skull as model for RP, explain how the skull can be prototyped for medical applications. Explain with suitable flow diagram. (10)

(ii) Discuss on the process and applications of Ballistic Particle Manufacturing. (6)
