G 6068

M.E. DEGREE EXAMINATION, MAY/JUNE 2007.

Elective

Computer Aided Design

CD 1622 — RAPID PROTOTYPING AND TOOLING

(Common to M.E-CAD/CAM, M.E.–Engineering Design and M.E.–Product Design and Development)

(Regulation 2005)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. List out the characteristics of successful product development and their challenges.

2. How are prototypes classified? Explain.

3. Write the advantages and limitations of SLS.

4. How do you avoid edge curling in SLA process?

5. What do you mean by BASS in FDM? Explain.

6. Can rapid prototyped parts be made of paper? Explain.

7. Which RP processes are best suited for production of ceramic parts? Why?

8. Explain the working principle of thermo jet printers.

9. What is tessellation?

10. Show the layer deposition for forming a component in LENS.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Explain 5-step concept generation methodology with a flow chart. (10)

(ii) What are the benefits of RP to the product designer and to the manufacturer? (6)

Or

(b) What is concept selection? Explain the six step selection process for concept selection. (16)

12. (a) (i) Explain the principle and process of Direct Metal Laser Sintering (DMLS) system. (10)

(ii) Discuss the practical applications of DMLS. (6)

Or

(b) (i) With a neat sketch explain the principle of stereolithography process. (10)

(ii) Discuss the material used in SLA. (6)

13. (a) Describe the FDM process with a suitable example and explain the influence of process parameters on quality of final product. (16)

Or

(b) (i) With a neat sketch, describe the LOM machine. (8)

(ii) Mention its advantages, limitations and applications. (8)

14. (a) With a neat diagram, explain the solid ground curing process and also list out the limitations and applications of the process. (16)

Or

(b) (i) Explain the working principle and material deposition process of 3-dimensional printers. (8)

(ii) Discuss the machine details and applications of Sander's model maker and JP system. (8)

15.

15. (a) Explain in detail about the medical applications of Rapid prototyping and the process involved. (16)

Or

(b) Write short notes on :

(i) Rapid tooling. (8)

(ii) Software for rapid prototyping. (8)