

30/11/13

Roll No.

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

7

B.E / B.Tech (FullTime) DEGREE END SEMESTER EXAMINATIONS, NOV / DEC 2013

Mechanical Engineering

VII- Semester
(Elective)

MF9023 RAPID PROTOTYPING

(Regulation-2008)

Time: 3 Hours

Answer ALL Questions

Max. Marks 100

PART-A (10 x 2 = 20 Marks)

1. What are the basic steps in RP process?
2. List any four practical applications of rapid prototyping.
3. What is the fundamental principle of SLA process?
4. What is the function of support base in LOM process?
5. What is the principle of LENS process?
6. Why heat for infiltration and infiltration process are required in post processing in 3D printing.
7. In what form material can rapid prototyping systems be classified a solid based? Name three such systems.
8. List any four materials used in medical field RP process.
9. Distinguish between the active and passive techniques in reverse engineering.
10. List any four software used in reverse engineering.

Part – B (5 x 16 = 80 marks)

11. a) i) Compare the liquid and solid based process based on principle, material and products. (8)
ii) List the important elements in extrusion head in FDM process. With the help of simple sketch, explain the functions of each elements. (8)
12. a) i) Distinguish between prototype and rapid prototype. (4)
ii) Why rapid prototype is important? (4)
iii) With the aid of simple flow chart explain the data flow in rapid prototyping. (8)
(OR)
b) i) What is the principle of shape deposition process? (4)
ii) With the aid of simple sketches, explain the process of building parts in incremental layer allows as complete access (embed actuators, sensors etc.) to the internal geometry in shape deposition manufacturing. (12)
13. a) Compare and contrast the Laser based SLS process and the DSPC process. List the advantages, limitations and applications of each system. (16)
(OR)
b) i) Explain how the 3D printer used for manufacturing the multicolored parts. (10)
ii) What are the critical factors that influence the performance and functions of 3D printer (6)

14. a) i) What are the common materials available for the SLS process? What are their respective applications? (10)
ii) What are the challenges for selection of materials in RP system? (6)

(OR)

- b) i) Briefly explain how the Mueller four step approach helpful for selecting the RP materials? (12)
ii) List the common materials used in FDM process. (4)

15. a) i) State the need for reverse engineering (8)
ii) With the help of simple sketch, Explain the 3D photogram technique used in reverse engineering and also list the advantages of non-contact type measurement (8)

(OR)

- b) Write a short notes on related to reverse engineering (16)
i) Data collection procedure for CMM,
ii) Preprocessing of the point clouds,
iii) Surface fitting