M.E. Second Semester (Mechanical Engineering (Adv. Manu. & Mech. Sys. Desig.)) (New-CGS)

13470 : Rapid Prototyping and Tooling : 2 MMD 2

P. Pages : 2
Time : Three Hours

* 0 8 7 4 *

AX - 3557
Max. Marks : 80

Notes :
1. Answer **three** question from Section A and **three** question from Section B.
2. Due credit will be given to neatness and adequate dimensions.
3. Assume suitable data wherever necessary.
4. Diagrams and chemicals equations should be given wherever necessary.
5. Retain the construction lines.
6. Illustrate your answer necessary with the help of neat sketches.
7. Discuss the reaction, mechanism wherever necessary.

SECTION - A

1. a) What is the significance of prototype design in product development? How is digital prototyping advantageous? **8**

b) List & explain the steps involved in product development. **6**

2. a) State & describe the basic steps of conceptual product design process. **7**

b) What is the RP wheel? Explain its four primary aspects in details. **6**

3. a) Which step in the entire process chain is, in your opinion, the shortest? Most tedious? Most automated? Support your choice. **7**

b) Many terms have been used to mean RP. Discuss three such terms & explain why they have been used in place of RP. **6**

4. a) Describe SAL process & discuss the effects of process parameters on the quality of the final product. **7**

b) Explain the working principle & details of process parameters of an FDM machine. **6**

5. Explain the working principle & details of process parameters of a selective Laser Sintering process. Also explain how SLS process can be used to produce direct & in-direct prototypes. **13**

SECTION - B

6.	a)	Illustrate, with diagrams, the meaning of degenerate facets.	**7**
	b)	List several possible applications for RP in medical & biomedical engineering.	**6**
7.	a)	What are the RP systems that are suitable for sandcasting? Briefly explain why & how they are suitable for sand casting.	**7**
	b)	Define reverse engineering. Why is reverse engineering needed?	**6**
8.	a)	Describe LOM processes & discuss the effects of process parameters on the quality of the final product.	**8**
	b)	State the differences between rapid tooling, manufacturing & conventional tooling, manufacturing.	**6**
9.	a)	Discuss the process, strengths & limitations of the 3-D printing process.	**7**
	b)	Discuss with diagrams the selective lases molting & electron beam melting process compare & contrast these processes.	**6**
10.		Describe the working principle, process parameters, strengths & weakness of a Laser engineering net shaping process (LENS).	**13**

****