

Code: 22MEMD1T5C

**I M.Tech - I Semester – Regular Examinations - MARCH - 2023****RAPID PROTOTYPING  
(MACHINE DESIGN)**

Duration: 3 hours

Max. Marks: 60

Note: 1. This paper contains 4 questions from 4 units of Syllabus. Each unit carries 15 marks and have an internal choice of Questions.

2. All parts of Question must be answered in one place.

BL – Blooms Level

CO – Course Outcome

			BL	CO	Max. Marks
<b>UNIT-I</b>					
1	a)	Despite the increase in relative complexity of the shape and form of products, project times have been kept relatively shorter. Why?	L3	CO1 CO2	8 M
	b)	Discuss the evolution of RP system indicating the history and their growth rate in the industrial sector.	L2	CO1 CO2	7 M
<b>OR</b>					
2	a)	Describe the five steps involved in a general RP process chain. Which steps do you think are likely to be iterated?	L2	CO1 CO2	8 M
	b)	What are Fabrication processes? Explain.	L3	CO1 CO2	7 M

<b>UNIT-II</b>					
3	a)	Explain the principle process and advantages and disadvantages and applications involved in SLA.	L3	CO2	10 M
	b)	As opposed to many of the liquid-based RP systems which uses photosensitive polymer, water is used in the Rapid Freeze Prototyping (RFP). What are the pros and cons of using water?	L2	CO2	5 M
<b>OR</b>					
4	a)	Explain the principle, process, working, advantages & disadvantages and applications involved in Cubital's Solid Ground Curing (SGC).	L3	CO2	10 M
	b)	What are photopolymers? Explain about photo polymerization.	L2	CO2	5 M
<b>UNIT-III</b>					
5	a)	Explain various process parameters of FDM.	L3	CO3	7 M
	b)	Describe the critical factors that will influence the performance and functions of 3D Systems' MJM, What are the advantages and disadvantages of the system?	L2	CO3	8 M
<b>OR</b>					
6	a)	Explain the process of SDM. What are the advantages and disadvantages and applications of the system?	L3	CO3	7 M

	b)	Explain the principle, process, working, advantages & disadvantages and applications involved in MJM ?	L2	CO3	8 M
<b>UNIT-IV</b>					
7	a)	Explain the principle, process, working, advantages & disadvantages and applications involved in SLS?	L2	CO4	10 M
	b)	How would you differentiate between the following types of Rapid tooling processes: i) Direct soft tooling ii) Indirect soft tooling.	L3	CO4	5 M
<b>OR</b>					
8	a)	Discuss the advantages and disadvantages of powder-based RP systems compared with: i) Liquid-based RP systems, ii) Solid-based RP systems.	L2	CO4	8 M
	b)	Using a sketch to illustrate your answer, describe the Laser Engineered Net Shaping process and principle.	L3	CO4	7 M