Code No: 157AB **R18**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech IV Year I Semester Examinations, December-2023/January-2024
ADDITIVE MANUFACTURING
(Mechanical Engineering)

Time: 3 Hours **Max. Marks: 75**

Note: i) Question paper consists of Part A, Part B.
ii) Part A is compulsory, which carries 25 marks. In Part A, Answer all questions.
iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

PART – A

(25 Marks)

1.a)	Name the three methods possible under the "Photo-curing" method.	[2]
b)	What are the three aspects of interests contained in the general definition prototype?	[3]
c)	What is photo polymerization?	[2]
d)	Why is wax used to fill the gaps in the cured resin in Solid Ground Curing?	[3]
e)	List the specifications of SLS.	[2]
f)	Differentiate between direct and indirect tooling.	[3]
g)	Write any two applications of RP in coin industry.	[2]
h)	Distinguish between missing facets, degenerate facets, and overlapping facets.	[3]
i)	Write the materials used for soft tooling and hard tooling?	[2]
j)	What are Form and fit models and where are they used?	[3]

PART – B

(50 Marks)

2.a) Write a note on the impact of AM on product development.
b) Explain the benefits of RP to the (i) Tooling and manufacturing engineer, (ii) Consumer. [5+5]

OR

3.a) Explain the parallels between the computer modeling process and prototyping process in a tabular form.
b) Describe the basic approach adopted by RP which is common to all the different techniques of RP. [5+5]

4.a) Briefly discuss the strengths, weaknesses, and applications of solid ground curing.
b) List out the applications, advantages, and disadvantages of Laminated Object Manufacturing (LOM). [5+5]

OR

5.a) Describe the process of fused deposition modeling and list the factors that affect the part quality.
b) Explain with a neat sketch the working principle of LOM process. [5+5]

6.a) Which rapid tooling techniques are best suited to produce ceramic parts. Explain anyone.
b) Discuss the advantages and disadvantages of powder-based RP systems compared with liquid-based RP systems. [5+5]

OR

7.a) Describe the working principle of three-dimensional printing along with its advantages.
b) Explain the role of indirect methods of rapid tool production. What are its limitations? [5+5]

8.a) Explain the important requirements that must be fulfilled during STL file generation.
b) Briefly discuss about 'Rhino' software. [5+5]

OR

9.a) Explain the salient features of 3 D doctor RP Software.
b) What are some of the limitations of the solutions, both generic and special cases, described to solve STL-related problems? Explain. [5+5]

10.a) Explain with a suitable example the application of Rapid Prototyping in Automotive Industry.
b) How is the application of RP models related to the purpose of prototyping? Explain.[5+5]

OR

11.a) Discuss the role of RP in medical applications.
b) Write the applications of additive manufacturing in forensic science and anthropology.[5+5]

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