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Code No. : 16147 (D) N/O

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS), HYDERABAD
Accredited by NAAC with A++ Grade

B.E. VI-Semester Main & Backlog Examinations, May/June-2023

Additive Manufacturing and its Applications (OE-IV)

Time: 3 hours

Max. Marks: 60

Note: Answer all questions from Part-A and any FIVE from Part-B

Part-A (10 × 2 = 20 Marks)

Q. No.	Stem of the question	M	L	CO	PO
1.	Classify the additive manufacturing processes according to ASTM F42 committee.	2	2	1	1
2.	List the commonly used terms of rapid prototyping.	2	1	1	1
3.	What do you mean by post-curing?	2	1	2	1
4.	What is the importance of milling process in solid ground curing?	2	2	2	1
5.	What do you mean by de-cubing process in LOM?	2	3	3	1
6.	Why FDM process is so popular for desktop printing?	2	3	3	1
7.	Why SLS powders are coated with low-melting materials?	2	2	4	1
8.	List four characteristics of a good binder material.	2	1	4	1
9.	Why is AM popular within the healthcare industry?	2	2	5	1
10.	What are the typical AM applications in design?	2	1	5	1
<i>Part-B (5 × 8 = 40 Marks)</i>					
11. a)	List the steps involved in rapid prototyping process. Which step in the entire process chain is, in your opinion, (i) the shortest? (ii) Most tedious? (iii) Most automated? Support your answer.	5	2	1	1
b)	Classify prototypes and explain the details.	3	3	1	5
12. a)	Compare and contrast the laser-based stereolithography systems and the solid ground curing systems. What are the advantages and disadvantages for each of the systems?	5	1	2	2
b)	How do you generate mask in SGC process? Explain its applications.	3	2	2	1

13. a)	State and explain the critical factors that will influence the performance and function of the following processes: (i) LOM (ii) FDM	5	3	3	2
b)	What are the advantages and disadvantages of solid-based systems compared with liquid-based systems?	3	2	3	1
14. a)	Compare and contrast the laser-based SLS process and the three-dimensional printing systems. What are the advantages and disadvantages for each of the systems?	4	2	4	2
b)	Explain how Z-Corp.'s 3D colour printer manufactures multi-colored parts. How do colourized prototypes add value to the AM part? Explain with a case study.	4	2	4	2
15. a)	Explain why and how AM is used in Coin making process?	4	3	5	1
b)	Describe how AM models can be used for pre-surgical operation planning. Use appropriate examples to illustrate your answer.	4	3	5	2
16. a)	STL files are problematic. Is this a fair statement to make? Discuss.	4	3	1	1
b)	Compare the applications of SLA and SGC processes.	4	3	2	2
17.	Answer any <i>two</i> of the following:				
a)	State and explain any one of the aerospace case studies of FDM process.	4	2	3	2
b)	Explain why support structures are not needed in the Selective Laser Sintering process.	4	3	4	1
c)	How AM technology is helpful in GIS applications?	4	3	5	1

M : Marks; L: Bloom's Taxonomy Level; CO; Course Outcome; PO: Programme Outcome

i)	Blooms Taxonomy Level - 1	20%
ii)	Blooms Taxonomy Level - 2	40%
iii)	Blooms Taxonomy Level - 3 & 4	40%
