Hall Ticket Number:

Code No. : 16136 AS (E)

VASAVI COLLEGE OF ENGINEERING *(AUTONOMOUS)*, HYDERABAD

Accredited by NAAC with A++ Grade

B.E. VI-Semester Advanced Supplementary Examinations, August-2022

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.	List the newly proposed rapid prototyping data format by ASTM F42 committee.	2	1	1	5
2.	How would you define prototype in the context of modern product development?	2	1	1	1
3.	What do you mean by photopolymerization?	2	1	2	1
4.	What is the advantage of photomasking in solid ground curing?	2	2	2	1
5.	How cross-hatched patterns are act as a support structure in case of LOM process?	2	3	3	2
6.	Show FDM process with a sketch.	2	1	3	1
7.	List out the materials used in SLS process.	2	2	4	1
8.	How the binder selection will takes place in printing materials like polymers, ceramics and metals?	2	3	4	1
9.	Why is AM popular within the aerospace industry?	2	2	5	4
10.	What is the role of additive manufacturing in COVID-19 pandemic?	2	2	5	2
	Part-B (5 × 8 = 40 Marks)				
11. a)	Describe the historical development of Rapid Prototyping and its related technologies.	4	2	1	1
b)	Discuss the benefits of Additive manufacturing technology to various personnel in Industry.	4	3	1	2
12. a)	One of the main advantages of SLA is that we can use semi-transparent polymers, so that internal details of parts can be discerned readily. List and describe at least two parts where this feature is valuable.	4	3	2	2
b)	State and explain the process flow of Solid Ground Curing (SGC) process.	4	2	2	5
13. a)	Compare LOM and FDM processes from the point of view of (i) Process characteristics (ii)Advantages and (iii) Limitations	4	1	3	1
b)	Describe the process flow of Cubic's Laminated Object Manufacturing.	4	2	3	1

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14. a)	Using a sketch to illustrate your answer, describe the Selective Laser Sintering (SLS) process.	4	1	4	1
b)	Compare SLS and 3DP process from the point of view of (i) Process characteristics (ii) Limitations (iii) Advantages	4	2	4	2
15. a)	Explain how AM systems can be applied to traditional industries like the jewelry, coin and tableware industries.	4	3	5	2
b)	Describe an example of a successfully implanted prosthetic. List the material, AM process, and other characteristics of the example and why this prosthetic used AM rather than a traditional manufacturing technique.	4	4	5	5
16. a)	Distinguish cleaning, postcuring and finishing which are the various tasks of postprocessing.	4	3	1	1
b)	Regarding SLA process, justify your answer: (i) Why only UV range lasers are used? (ii) Why only photo-polymers are used as materials?	4	3	2	2
17.	Answer any ***two*** of the following:				
a)	Which of the following process produce more wastage. Justify your answer. (i) LOM (ii) FDM	4	3	3	2
b)	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	3	4	1
c)	How AM technology helpful in arts and architecture applications?	4	3	5	2

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

i)	Blooms Taxonomy Level – 1	20%
ii)	Blooms Taxonomy Level – 2	30%
iii)	Blooms Taxonomy Level – 3 & 4	50%

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