

THE KAVERY ENGINEERING COLLEGE
(An Autonomous Institution)

B.E./B.TECH. DEGREE END SEMESTER THEORY EXAMINATIONS, APRIL-MAY 2025

Sixth Semester

Mechanical Engineering

CME339 – Additive Manufacturing

Regulations – 2021

Duration : 3 Hrs

Maximum : 100 Marks

PART – A (ANSWER ALL QUESTIONS) (Marks 10*2=20)

Q.No	Questions	BLT	CO	Marks
1.	Define rapid tooling.	L1	1	2
2.	State any two benefits of the additive manufacturing process.	L2	1	2
3.	Why do additive manufacturing parts show stair-stepping effects?	L2	2	2
4.	What is meant by model slicing?	L1	2	2
5.	Name any two limitations of SLA.	L2	3	2
6.	How is material delivered in the LENS process?	L1	3	2
7.	Name any two materials used in the SLM process.	L1	4	2
8.	Compare SLS process with FDM process.	L4	4	2
9.	List any two applications of the Binder Jetting process.	L1	5	2
10.	How does thermal bonding differ from adhesive bonding?	L2	5	2

PART – B (ANSWER ALL QUESTIONS) (Marks 5*16 = 80)

Q.No	Questions	BLT	CO	Marks
11.	a Explain in detail about various steps involved in additive manufacturing process chain with simple sketches.	L2	1	16
	Or			
	b Outline about the potential benefits and challenges of additive manufacturing in electronics and food printing applications with suitable examples.	L2	1	16
12.	a Explain the unique capabilities of Additive Manufacturing and how they influence product design.	L2	2	16

Or

	b	Explain STL file format used in AM. What are the common problems associated with STL files? Discuss the problems with a suitable sketch.	L2	2	16
13.	a	Apply the top-down and bottom-up approaches in Stereolithography apparatus to determine which method would be more suitable for printing a large dental model with high surface detail.	L3	3	16
		Or			
	b	Construct any one directed energy deposition method to repairing turbine blades.	L3	3	16
14.	a	Experiment with the process of Selective Laser Sintering with a neat sketch. Describe the powder fusion mechanism and list the commonly used materials and applications.	L3	4	16
		Or			
	b	Discuss the FDM process with a neat sketch. Mention the types of thermoplastics used, and discuss the major applications and limitations of FDM.	L3	4	16
15.	a	Analyze the trade-offs involved in using photopolymer-based materials in Material Jetting with respect to environmental safety, mechanical strength, and recyclability.	L4	5	16
		Or			
	b	Analyze the working principle of Laminated Object Manufacturing with a suitable sketch. How does the bonding mechanism influence the mechanical properties?	L4	5	16