

## Fourth Semester B.E./B.Tech. Degree Examination, Dec.2024/Jan.2025

### Additive Manufacturing

Time: 3 hrs.

Max. Marks: 100

*Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.  
2. M : Marks , L: Bloom's level , C: Course outcomes.*

Module – 1				M	L	C
Q.1	a.	Explain the various steps involved in Genetic AM process.	10	L1	CO2	
	b.	If Computer – Aided Design Technology is a boon for AM machine, then justify your statement.	10	L2	CO2	
OR						
Q.2	a.	Suppose you have a complex geometric design to produce, would you choose AM CNC machining and why?	10	L3	CO2	
	b.	Compare the benefits and demerits of AM and CNC machining in terms of design flexibility , material usage and production speed.	8	L3	CO3	
	c.	Tabulate Pros and Cons of 3D printing.	2	L3	CO4	
Module – 2						
Q.3	a.	With a neat schematic diagram, elaborate the process of selective laser sintering.	10	L1	CO2	
	b.	Elaborate the following powder Fusion Mechanisms : i) Solid State Sintering. ii) Liquid Phase Sintering and Partial Melting.	10	L1	CO2	
OR						
Q.4	a.	Elaborate EBM process with a neat schematic of an Electron Beam Apparatus.	10	L1	CO2	
	b.	Discuss the various types of materials used for FEM process.	5	L2	CO1	
	c.	Enlist the limitations of FDM process.	5	L2	CO3	
Module – 3						
Q.5	a.	Illustrate Research achievements in Printing Deposition.	10	L2	CO3	
	b.	Describe with a neat schematic of Ultrasonic consolidation sheet lamination process.	10	L2	CO2	
OR						
Q.6	a.	Tabulate benefits and drawbacks of Beam Deposition process.	8	L3	CO3	
	b.	Elucidate Electrochemical liquid deposition system with a neat sketch.	8	L2	CO2	

	c.	Discuss any one type of Material Delivery for a Beam Deposition Process.	4	L2	CO3
<b>Module – 4</b>					
<b>Q.7</b>	a.	With a neat flowchart, explain the Direct Digital Manufacturing System.	10	L1	CO2
	b.	Explain the process of Production Planning and Control in Additive Manufacturing.	10	L1	CO2
<b>OR</b>					
<b>Q.8</b>	a.	Elaborate the process of preparation of CAD models for an AM machine.	10	L1	CO2
	b.	Discuss the need for Surface Texture Improvements and its types.	5	L2	CO3
	c.	Describe the process of preparation of AM part for use as a pattern for molding (or) casting process.	5	L1	CO2
<b>Module – 5</b>					
<b>Q.9</b>	a.	If a patient is Deaf then, how to resolve it using DDM. Justify.	10	L1	CO2
	b.	Narrate the reasons for applying multiple material strategies for AM machine.	5	L2	CO3
	c.	Enlist any two application areas that don't involve conventional CAD modeling.	5	L2	CO3
<b>OR</b>					
<b>Q.10</b>	a.	Elaborate the technology used to move patient teeth as desired by Orthodontist.	10	L3	CO4
	b.	Analyze the impact of additive manufacturing on the life – cycle costing of parts.	10	L2	CO3

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