

Code No: R22A0317

**MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY**

(Autonomous Institution – UGC, Govt. of India)

**III B.Tech I Semester (Honor) Regular Examinations, November 2025****Additive Manufacturing**

(ME)

<b>Roll No</b>									
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**Time: 3 hours****Max. Marks: 60****Note:** This question paper contains two parts A and B

Part A is compulsory which carries 10 marks and Answer all questions.

Part B Consists of 5 SECTIONS (One SECTION for each UNIT). Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 10 marks.

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**PART-A ( 10 Marks)****(Write all answers of this part at one place)**

			<b>BCLL</b>	<b>CO(s)</b>	<b>Marks</b>
<b>1</b>	A	Which AM technology uses filament extrusion?	<b>L1</b>	<b>CO-I</b>	<b>[1M]</b>
	B	Name two industries where Rapid Manufacturing is commonly applied.	<b>L2</b>	<b>CO-I</b>	<b>[1M]</b>
	C	Name the liquid material commonly used in Stereo lithography.	<b>L2</b>	<b>CO-II</b>	<b>[1M]</b>
	D	What is the basic principal of Fused Deposition Modeling (FDM)?	<b>L3</b>	<b>CO-II</b>	<b>[1M]</b>
	E	Expand 3DP in Additive Manufacturing.	<b>L3</b>	<b>CO-III</b>	<b>[1M]</b>
	F	Which laser type is commonly used in LENS technology?	<b>L4</b>	<b>CO-III</b>	<b>[1M]</b>
	G	Which material type is most suitable for biocompatible implants?	<b>L4</b>	<b>CO-IV</b>	<b>[1M]</b>
	H	Mention one ceramic material used in AM applications.	<b>L2</b>	<b>CO-IV</b>	<b>[1M]</b>
	I	Expand RT in manufacturing.	<b>L5</b>	<b>CO-V</b>	<b>[1M]</b>
	J	Differentiate between direct and indirect rapid tooling in one line.	<b>L4</b>	<b>CO-V</b>	<b>[1M]</b>

**PART-B ( 50 Marks)****SECTION-I**

<b>2</b>	A	Discuss the challenges and opportunities of implementing On-Demand Manufacturing in the aerospace supply chain.	<b>L5</b>	<b>CO-I</b>	<b>[5M]</b>
	B	Explain why post-processing is important in AM parts.	<b>L4</b>	<b>CO-I</b>	<b>[5M]</b>
		<b>OR</b>			
<b>3</b>	A	Assess the environmental impact of Additive Manufacturing compared to convention subtractive methods.	<b>L6</b>	<b>CO-I</b>	<b>[5M]</b>
	B	What are the limitations of current file formats (STL, AMF, 3MF) in handling complex AM designs?	<b>L4</b>	<b>CO-I</b>	<b>[5M]</b>

### **SECTION-II**

- |    |   |  |    |       |      |
|----|---|--|----|-------|------|
| 4  | A | How does Laminated Object Manufacturing (LOM) build parts layer by layer?                                  | L4 | CO-II | [5M] |
|    | B | Compare the advantages and limitations of SLA with FDM in terms of accuracy, speed, and cost.              | L5 | CO-II | [5M] |
| OR |   |  |    |       |      |
| 5  | A | SLA produces high accuracy but has material limitations. How can this be addressed in advanced AM systems? | L2 | CO-II | [5M] |
|    | B | Critically discuss the future scope of solid-based systems (FDM/LOM) in large-scale manufacturing.         | L3 | CO-II | [5M] |

### **SECTION-III**

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|----|---|--|----|--------|------|
| 6  | A | Analyze the strengths of DSPC compared to traditional casting processes.                           | L4 | CO-III | [5M] |
|    | B | How can e-manufacturing through laser sintering transform global supply chains?                    | L5 | CO-III | [5M] |
| OR |   |  |    |        |      |
| 7  | A | How does the choice of material affect product quality in SLS?                                     | L2 | CO-III | [5M] |
|    | B | Evaluate the significance of customized metal parts production using LENS in aerospace industries. | L5 | CO-III | [5M] |

### **SECTION-IV**

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|----|---|--|----|-------|------|
| 8  | A | Discuss one case study of AM using composite materials.  | L1 | CO-IV | [5M] |
|    | B | How does material selection impact the performance and durability of Am products?                  | L2 | CO-IV | [5M] |
| OR |   |  |    |       |      |
| 9  | A | Assess the role of multi-material printing (polymers + metal + ceramics) in future Am development. | L1 | CO-IV | [5M] |
|    | B | What are the research challenges in developing sustainable and recyclable materials for AM?        | L3 | CO-IV | [5M] |

### **SECTION-V**

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|----|---|--|----|------|------|
| 10 | A | Give one case study example of soft tooling application in product development.            | L4 | CO-V | [5M] |
|    | B | How does direct rapid tooling impact cost and product lifecycle in aerospace applications? | L2 | CO-V | [5M] |
| OR |   |  |    |      |      |
| 11 | A | Discuss how fabrication process in rapid tooling differs from traditional tooling.         | L5 | CO-V | [5M] |
|    | B | Compare the use of rapid tooling in automotive vs. electronics industries with examples.   | L4 | CO-V | [5M] |

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