Roll No. | | | | | | | | | | |

ANNA UNIVERSITY (UNIVERSITY DEPARTMENTS)

B.E. - END SEMESTER EXAMINATIONS, NOV/DEC 2021

DEPARTMENT OF MANUFACTURING ENGINEERING

MF7071- ADDITIVE MANUFACTURING TECHNOLOGY

(Regulation 2015)

Time: 3 hrs | Max.Marks: 100

PART- A (10 x 2 = 20 Marks)
(Answer all Questions)

Q. No	Questions	Marks
1	Can you classify additive manufacturing techniques? If so, how?	2
2	How is additive manufacturing different from traditional manufacturing methods?	2
3	Name a design tool used in additive manufacturing preparation.	2
4	What is the significance of part orientation in additive manufacturing?	2
5	What is the suitable process to 3D print Titanium? Justify your answer.	2
6	What is SLA in additive manufacturing, and what materials does it use?	2
7	Describe briefly the FDM technology in additive manufacturing.	2
8	How does LOM differ from FDM in additive manufacturing?	2
9	Provide an example of a medical application benefiting from additive manufacturing.	2
10	Can you explain briefly the process of beam deposition in additive manufacturing?	2

PART- B (5 x 13 = 65 Marks)

Q. No	Questions	Marks
11 (a)	Describe the Additive manufacturing process chain and elaborate on each step involved, highlighting how these steps interconnect to produce a final product.	13
	(OR)	
11 (b)	Present a detailed case study of an Additive Manufacturing project, outlining the problem addressed, the AM technology used, the process followed, and the benefits realized.	13
12 (a)	Explain how CAD models are prepared for Additive Manufacturing (AM). Discuss why part orientation and support structure generation are crucial in AM, and how they affect the final print quality.	13
	(OR)	
12 (b)	What is Design for Additive Manufacturing (DFAM)? Describe its goals and how it leverages AM's unique capabilities to enhance part quality. Provide	13

	examples of DFAM in medical applications and highlight the benefits of using AM in this field.	
13 (a)	Describe SLA photo polymerization, including materials, solidification process, advantages, and common applications in additive manufacturing.	**13**
	(OR)	
13 (b)	Contrast SLS and EBM in additive manufacturing, covering process, materials, parameters, and typical applications.	**13**
14 (a)	Explain FDM's principle, materials, applications, limitations, and Bioextrusion significance.	
	(OR)	
14 (b)	Compare LOM's gluing and thermal bonding, emphasizing strengths, weaknesses, and application suitability.	**13**
15 (a)	Explain droplet formation technologies, including Continuous and Drop on Demand modes, and discuss 3D printing advantages, materials, and applications.	**13**
	(OR)	
15 (b)	Describe Beam Deposition Process, like LENS, covering material delivery, parameters, materials, and applications in manufacturing sectors.	**13**

PART- C (1 x 15 = 15 Marks)

(Q.No. 16 is Compulsory)

Q. No	Questions	Marks
16 (i)	Explain the various Powder bed fusion mechanisms involved in SLM Process with neat sketches.	**16**