Reg. No.												

Question Paper Code	12182

B.E. / B.Tech. - DEGREE EXAMINATIONS, NOV / DEC 2023

Seventh Semester

Production Engineering

20PRPC701 - ADDITIVE MANUFACTURING

(Regulations 2020)

Duration: 3 Hours Max. Marks: 100

PART - A (10 × 2 = 20 Marks)

Answer ALL Questions

		Marks, K-Level, CO
1.	What is rapid prototyping?	*2,K1,CO1*
2.	List the additive manufacturing applications in Electronics Printing.	*2,K1,CO1*
3.	Write the advantages of stereo lithography.	*2,K1,CO2*
4.	What is Fused Deposition Modeling?	*2,K1,CO2*
5.	What is Powder Bed Fusion (PBF)?	*2,K1,CO3*
6.	What is one limitation of Binder Jetting compared to other 3D printing methods?	*2,K1,CO3*
7.	How is Material Jetting technology beneficial in the aerospace industry?	*2,K1,CO4*
8.	What is Directed Energy Deposition?	*2,K1,CO4*
9.	What are some common applications of LOM?	*2,K1,CO5*
10.	What is Ink-Based Direct Writing (DW)?	*2,K1,CO5*

PART - B (5 × 13 = 65 Marks)

Answer ALL Questions

11.	a)	Explain the rapid prototyping process in detail.	*13,K2,CO1*
		OR	
	b)	Explain the STL file format in detail.	*13,K2,CO1*
12.	a)	Explain the working principle of Fused Deposition Modeling (FDM) as an additive manufacturing technique.	*13,K2,CO2*
		OR	
	b)	Explain the fundamental principles of Digital Light Processing (DLP) as a 3D printing technology.	*13,K2,CO2*
13.	a)	Describe the basic process steps involved in Powder Bed Fusion (PBF).	*13,K2,CO3*
		OR	

b) Discuss the advantages and limitations of using titanium alloys in Electron Beam Melting (EBM) for aerospace applications. Include details about material properties, performance benefits, and any potential challenges. *13,K2,CO3*

14. a) Discuss the types of materials that can be used in Laser Engineered Net Shaping (LENS) and their significance in various applications. Highlight the advantages and limitations of different material choices in DED. *13,K2,CO4*

OR

b) Discuss the significance of resolution and layer thickness in Material Jetting. How do these factors affect the level of detail and precision achievable in 3D-printed objects? *13,K2,CO4*

15. a) Explain the step-by-step process of Laminated Object Manufacturing (LOM), highlighting the key stages involved in layering, bonding, and cutting. *13,K2,CO5*

OR

b) Discuss the fundamental principles of Ink-Based Direct Writing (DW) in additive manufacturing. *13,K2,CO5*

PART - C (1 × 15 = 15 Marks)

16. a) (i) Explain the top down and bottom up approaches in stereo lithography. *8,K3,CO2*

(ii) Explain the Development of Additive Manufacturing (AM) Technology. *7,K3,CO1*

OR

b) (i) List the advantages applications and limitations of Digital Light Processing. *8,K3,CO2*

(ii) Explain the rapid prototyping classification in detail. *7,K3,CO1*