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**BTECH**  
**(SEM VII) THEORY EXAMINATION 2024-25**  
**ADDITIVE MANUFACTURING**

TIME: 3 HRS

M.MARKS: 100

**Note:** Attempt all Sections. If case of any missing data; then choose suitably.

## SECTION A

1. Attempt *all* questions in brief.

2 x 10 = 20

S No.	Particulars	Level
a.	Define additive manufacturing.	K1
b.	List two differences between additive manufacturing and CNC machining.	K1
c.	What is the significance of prototyping in additive manufacturing?	K2
d.	Mention any two processes used in vat photo-polymerization.	K1
e.	Write a short note on powder fusion mechanisms.	K2
f.	What is the importance of CAD in additive manufacturing?	K1
g.	Explain the concept of small batch production in the context of additive manufacturing.	K2
h.	What are the applications of aerosol printing?	K2
i.	Name any two challenges associated with STL file formats in additive manufacturing.	K1
j.	Mention two future trends in additive manufacturing.	K2

## SECTION B

2. Attempt any *three* of the following:

10 x 3 = 30

a.	Explain the different types of additive manufacturing technologies with examples.	K3
b.	Describe the generalized additive manufacturing process chain in detail.	K3
c.	Discuss the significance of powder handling in powder bed fusion processes.	K3
d.	How do material jetting systems work? Explain with examples of materials and machines used.	K3
e.	Elaborate on the challenges and solutions in quality assurance for additive manufacturing.	K3

## SECTION C

3. Attempt any *one* part of the following:

10 x 1 = 10

a.	Explain the working principle of stereo-lithography with a neat diagram.	
b.	Describe the extrusion-based additive manufacturing process and its associated path control mechanisms.	

4. Attempt any *one* part of the following:

10 x 1 = 10

a.	Discuss the significance of engineering design rules in additive manufacturing.	
b.	Highlight the role of intellectual property in additive manufacturing.	



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**5. Attempt any one part of the following: 10 x 1 = 10**

a.	Describe directed energy deposition (DED) processes and their applications in various industries.	
b.	Discuss the trends and challenges of using hybrid systems in additive manufacturing.	

**6. Attempt any one part of the following: 10 x 1 = 10**

a.	Explain the applications of additive manufacturing in aerospace and biomedical industries.	
b.	Analyze the concept of customized mass production and its relevance in additive manufacturing.	

**7. Attempt any one part of the following: 10 x 1 = 10**

a.	Explain the software issues beyond STL file manipulations in additive manufacturing.	
b.	Describe the eight steps in additive manufacturing and their variations across AM machines.	

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