



## AM June 2024 QP - 2024 question paper

B.e. (mechanical) (Savitribai Phule Pune University)



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Total No. of Questions : 8]

SEAT No. : \_\_\_\_\_

**PB2370**

[Total No. of Pages : 2

[6263]-220

**B.E. (Mechanical Engineering)  
ADDITIVE MANUFACTURING  
(2019 Pattern) (Semester-VII) (Elective-IV) (402045C)**

*Time : 2½ Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) Attempt Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8.
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Figures to the right indicate full marks.
- 4) Use of electronic pocket calculator is allowed.
- 5) Assume suitable data if necessary.

- Q1)** a) Explain the process of Polyjet Printing with suitable sketch. Also write merits, demerits and applications. [9]
- b) Explain the process of Direct Metal Deposition (DMD) with suitable sketch. Also write merits, demerits and applications. [9]

OR

- Q2)** a) Explain Bio-printing with principle, construction and working with suitable sketch. [9]
- b) Explain the process of Fused Deposition Modeling (FDM) with suitable sketch. Also write merits, demerits and applications. [9]
- Q3)** a) Explain varieties of heat treatment applied in pre- and post-processing of additive manufacturing based products. [8]
- b) Explain types of material used in Additive Manufacturing. Also write merits, demerits and application. [9]

OR

- Q4)** a) Explain the materials used in 4D Printing with important process parameters, benefits, drawbacks, Limitations and appropriate applications. [9]
- b) Explain use of Shape-Memory Alloys in Additive Manufacturing with important process parameters, benefits, drawbacks, Limitations and appropriate applications. [8]

*P.T.O.*

- Q5)** a) Explain Cold end and hot end of Extruders used in Polymer based 3D Printers. [9]  
b) Explain the design considerations of Powder Bed Spreading Mechanisms also known as recoater system used in Metal based 3D Printers. [9]

OR

- Q6)** a) Explain function of gas circulation system, powder handling system and base plate in 3D printer. [9]  
b) Explain the classification of Equipment Topology/Layout Frame Designs used in 3D Printers with illustrations. [9]
- Q7)** a) What is 4D Printing? Explain and illustrate its applications. [8]  
b) Explain how additive manufacturing is used in Assistive Devices Sector. Also write merits, demerits and practical feasible applications with illustrations. [9]

OR

- Q8)** a) Explain how additive manufacturing is used in Bio-medical Applications. Also write merits, demerits and practical feasible applications with illustrations. [9]  
b) What are the Bio-materials? Explain and illustrate their applications. [8]

