



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

[6263]-220

[Total No. of Pages : 2

**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]

