

Reg. No.

Question Paper Code

11950

M.E / M.Tech.- DEGREE EXAMINATIONS, APRIL / MAY 2023

Third Semester

M.E - CAD/CAM

20PCDEL305 - ADDITIVE MANUFACTURING

(Regulations 2020)

Duration: 3 Hours

Max. Marks: 100

PART-A (10 × 2 = 20 Marks)

Answer ALL Questions

- | | <i>Marks,
K-Level, CO</i> |
|---|-------------------------------|
| 1. Define rapid tooling. | 2,K1,CO1 |
| 2. Name any four 3D printing companies for printing polymers. | 2,K1,CO1 |
| 3. What is data interfacing? | 2,K1,CO2 |
| 4. List some commonly used support structures designs in Reverse Engineering and CAD Modelling? | 2,K1,CO2 |
| 5. Define photo polymerization. | 2,K1,CO3 |
| 6. What is Solid Ground Curing process (SGC)? | 2,K2,CO3 |
| 7. Why the support structures are not generally required in the powder bed fusion process? | 2,K2,CO4 |
| 8. What are the laser parameters that affect the Laser-engineered net shaping (LENS) process? | 2,K2,CO4 |
| 9. Describe 3 D printing process. | 2,K2,CO5 |
| 10. What is the working principle of Ballistic Particle Manufacturing (BPM)? | 2,K1,CO5 |

PART - B (5 × 13 = 65 Marks)

Answer ALL Questions

11. a) Explain in detail the steps involved in the generic additive manufacturing process with neat sketches. 13,K2,CO1
- OR**
- b) Explain with an example on physical and virtual prototyping process. 13,K2,CO1
12. a) Explain in detail the support generation and support structure design for a polymer-based additive manufacturing process. 13,K2,CO2
- OR**
- b) Explain elaborately the data processing of rapid prototyping techniques. 13,K2,CO2

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze; K5 – Evaluate; K6 – Create

11950

13. a) Explain the resin formulation in terms of photoinitiator system, monomer formulation and interpenetrating polymer network formulation. *13,K2,CO3*

OR

- b) Discuss in detail the working process of solid ground curing process. *13,K2,CO3*

14. a) Explain the various powder bed fusion mechanisms for selective laser sintering. *13,K2,CO4*

OR

- b) Explain elaborately the Laser-engineered net shaping (LENS) process with a neat sketch. What are the materials that can be made by the LENS process? *13,K2,CO4*

15. a) Discuss the strength and weaknesses of solid-based, liquid-based and powder-based additive manufacturing processes. *13,K2,CO5*

OR

- b) Explain selective laser melting process and give its importance in additive manufacturing process. *13,K2,CO5*

PART - C (1 × 15 = 15 Marks)

16. a) Discuss CAD Model Preparation with an Example? *15,K2,CO2*

OR

- b) Elaborate on the various thermal techniques for the post-processing of additive manufacturing parts. *15,K2,CO4*