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**Question Paper Code : 70921**

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2023.

Seventh Semester

Manufacturing Engineering

MF 8071 – ADDITIVE MANUFACTURING

(Common to : Aerospace Engineering / Material Science and Engineering /  
Mechanical Engineering / Mechanical Engineering (Sandwich) /  
Mechatronics Engineering)

(Regulations 2017)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define rapid manufacturing.
2. State the benefits of additive manufacturing process.
3. List the design tools included for additive manufacturing.
4. What is the role of DFAM in additive manufacturing?
5. Define photo-polymerization process.
6. What is electron beam melting?
7. Classify the types of material extrusion processes.
8. Classify the types of sheet lamination processes.
9. State the benefit of 3D printing.
10. What are the process parameters of laser metal deposition?

PART B — (5 × 13 = 65 marks)

11. (a) Write a short note on the need and development of AM systems.  
Or  
(b) Explain in detail about the transition of rapid prototyping to additive manufacturing.
12. (a) What is part orientation? Explain with illustrations.  
Or  
(b) Discuss the steps involved in model slicing.
13. (a) Explain the working principle of SLA and write its merits and applications.  
Or  
(b) Explain the applications of SLS and its processing techniques.
14. (a) Explain the working principle of FDM and write its merits and applications.  
Or  
(b) What are the steps in pre build and post-build process for LOM? Explain.
15. (a) Brief the post processing types of LENS. Explain each with suitable example.  
Or  
(b) Discuss few case studies of 3D printing.

PART C — (1 × 15 = 15 marks)

16. (a) Discuss the seven categories of additive manufacturing process briefly.  
Or  
(b) Describe the advantages of rapid prototyping in terms of its beneficiaries such as the product designers, tool designer, manufacturing engineer, marketers and consumers.
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