Reg. No. : ☐☐☐☐☐☐☐☐☐☐☐☐

## Question Paper Code : 90882

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2022.

Seventh Semester

Manufacturing Engineering

MF 8071 – ADDITIVE MANUFACTURING

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

(Regulations 2017)

Time : Three hours                                      Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1.   What is the difference between rapid tooling and rapid manufacturing?

2.   What is our understanding on "complexity for free" related to additive manufacturing?

3.   Make a short note on Tool Path Generation methods.

4.   "Additive Manufacturing enables the usage of complex geometry in achieving design goals without incurring time or cost penalties compared with simple geometry". Comment on this.

5.   What is photopolymerization in SLA?

6.   State the critical attributes that influence the performance of SLS process.

7.   Mention the types of defects possible in FDM.

8.   Internal features and small channels are difficult or impossible with a bond-then-form-approach. Why?

9.   Enumerate the parameters having an impact on the output of LENS process.

10.  What is a Bioplotter?

PART B — (5 × 13 = 65 marks)

11. (a) Explain with neat sketch about Additive Manufacturing Process Chain.

Or

(b) Discuss in detail on General integration of an AM machine.

12. (a) Write a detailed note on the AM unique capabilities with examples.

Or

(b) Explain in detail the parameters and associated limitations of AM for Medical Applications.

13. (a) Elucidate about Vector Scan SL approach of Photo polymerization (VP) and the Phases required to create a part.

Or

(b) Explain about working Principle, advantages, limitations and applications of Electron Beam Melting.

14. (a) Explain why is solidification rate and temperature gradient considered the key characteristic to control in BD processing.

Or

(b) Elaborate on the significant parameters to be controlled to have Precise control in Extrusion Technology.

15. (a) Elucidate about Technical Challenges of Printing processes.

Or

(b) Discuss in detail on Powder feeding arrangements in Beam deposition processes.

PART C — (1 × 15 = 15 marks)

16. (a) Evaluate the pros and cons of Additive Manufacturing and CNC machining.

Or

(b) Discuss extensively "How sustainable is AM today".

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