Reg. No. : ☐☐☐☐☐☐☐☐☐☐☐☐

Question Paper Code : 50899

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2023

Seventh Semester

Aerospace Engineering

MF 8071 – ADDITIVE MANUFACTURING

(Common to : Manufacturing 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. Distinguish between additive manufacturing and subtractive manufacturing.

2. How Rapid Tooling is differ from conventional Tooling.

3. List the factors affects the part orientation?

4. Justify the Support structure generation in additive manufacturing.

5. What are the basic elements in Stereo lithography apparatus?

6. List the process parameters in electron beam melting?

7. Is it FDM is a superior process among the additive manufacturing methods? Justify.

8. List the post processing methods in LOM.

9. State Droplet formation technologies.

10. Mention the use of Bioplotter in additive manufacturing

PART B — (5 × 13 = 65 marks)

11. (a) Explain the process chain of additive manufacturing in details with appropriate sketch. (13)

Or

(b) (i) Explain the need for additive manufacturing in product development. (8)

(ii) Explain the bridge tooling and production tooling in rapid prototyping with suitable example. (5)

12. (a) Elaborate the Tool Path generation and its algorithm in additive manufacturing. (13)

Or

(b) (i) Enumerate the various Geometric modelling techniques in rapid prototyping. (8)

(ii) Explain the principles in DFAM to improve the part quality. (5)

13. (a) Explain the SLS additive manufacturing process with its preprocessing and post processing steps in detail with suitable sketch. (13)

Or

(b) Explain the suitable additive manufacturing process to manufacture the investment casting with respect to materials, preprocessing, post processing in detail with neat sketch. (13)

14. (a) Explain any one of the solid based AM process w.r.t. principle, process parameter, basic elements advantages, disadvantages and applications with neat sketch. (13)

Or

(b) Explain the LOM additive manufacturing process with pre-processing and post processing methods in detail with appropriate sketch? (13)

15. (a) Explain the process description, material delivery, process parameters, preprocessing and post processing methods in laser engineered net shaping with suitable sketch. (13)

Or

(b) Explain any two droplet formation technologies in detail with appropriate sketch. (13)

PART C — (1 × 15 = 15 marks)

16. (a) Explain the pre-processing, post processing methods of electron beam melting in scaffold design and fabrication with appropriate sketch. (15)

Or

(b) Discuss a case study an applications of additive manufacturing in Bio Medical field. (15)

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