

Reg. No. :

Question Paper Code : 10874

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

First Semester

Manufacturing Engineering

MF 4101 – ADVANCES IN MANUFACTURING PROCESSES

(Regulations 2021)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What are the advantages of plasma arc machining?
2. List the differences between water jet machining and abrasive jet machining.
3. How does the electrolyte influence the Electro Chemical Machining process?
4. What is free form optics?
5. How is orbital forging better over extrusion processes?
6. Mention few principles based on which micro blanking is achieved.
7. How complicated is micro-turning compared to other micromachining processes?
8. Mention few applications of chemical etching.
9. What is selective laser sintering?
10. List any 4 limitations of thermal spraying.

PART B — (5 × 13 = 65 marks)

11. (a) Explain the principle construction and working of Laser beam machining stating its advantages. (13)

Or

- (b) Explain the mechanism involved in material removal of Ultrasonic machining and discuss how it is superior over conventional machining processes. (13)

12. (a) Explain the level of precision achieved through Ultra precision turning mentioning its applications in Various areas. (13)

Or

- (b) Explain how aspherical surfaces are produced by precision grinding processes and state the need and application of such components in optics. (13)
13. (a) Present an overview of Powder metal techniques and their applications in mechanical industries. (13)

Or

- (b) Explain the principle and working of high speed extrusion process and the industries that exploit it. (13)

14. (a) Explain the following process with neat sketches

(i) Micro drilling (7)

(ii) Micro wire EDM (6)

Or

- (b) (i) Explain any one type of top down nano fabrication technique with diagrams wherever necessary. (8)

(ii) Explain the principle of Quantum dot fabrication technique with neat diagrams. (5)

15. (a) Describe in detail the scope of future rapid Prototyping processes.

Or

- (b) (i) Describe the steps involved in laminated object manufacturing. (10)
- (ii) Write a brief notes on fused deposition modelling. (3)

PART C — (1 × 15 = 15 marks)

16. (a) Explain the industrial need, applications and advantages of various micromachining processes with suitable illustrations.

Or

- (b) Present a case study that resulted in improvement in the operations of an industry that was achieved through replacing conventional manufacturing techniques with additive manufacturing technique.

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