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Question Paper Code : 80993

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2025.

Fifth/Sixth/Seventh/Eighth Semester

Mechanical Engineering

CME 387 — NON-TRADITIONAL MACHINING PROCESSES

(Regulations 2021)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Mention the advantages of non-traditional machining process over conventional machining process.
2. Write any two applications of non-traditional machining process.
3. What is chemical machining process?
4. Identify any two limitations of electro chemical grinding.
5. Mention any one advantage and limitation of electric discharge machining.
6. Define material removal rate in laser beam machining.
7. Name any two abrasive medium used in abrasive flow machining.
8. What is the principle of Magnetorheological finishing?
9. List any two process parameters that affect performance in Electrochemical Discharge Machining (ECDM).
10. Distinguish between non-traditional machining and hybrid non-traditional machining.

PART B — (5 × 13 = 65 marks)

11. (a) With a neat sketch explain in detail the working of abrasive water jet machining (AWJM)? Mention its advantages and limitations over abrasive jet machining.

Or

- (b) Discuss in detail on the working principle, equipment used and the effect of process parameters in an ultrasonic machining (USM) process with the help of a neat sketch.

12. (a) With a neat illustration explain in detail the working of Electro-chemical honing process. List its advantages and limitations.

Or

- (b) Explain in detail the working of Electro chemical deburring with a neat sketch. Also mention its advantages.

13. (a) Discuss in detail the principle and operation of Wire Electric Discharge Machining (WEDM) process with a neat diagram.

Or

- (b) Elucidate the working of Ion Beam Machining (IBM) with a neat illustration. How it differs from electron beam machining? Discuss.

14. (a) Explain the working of a Chemo mechanical polishing with a suitable diagram. Discuss how it helps in achieving nano-finishing?

Or

- (b) Explain in detail the principle and working of Magneto rheological abrasive flow finishing with a neat sketch.

15. (a) Draw and explain the working of Abrasive Electrical Discharge Machining (AEDM). Mention its advantages and limitations.

Or

- (b) Compare any three hybrid non-traditional machining processes in terms of energy source, material removal mechanism, tool wear and typical applications.

PART C — (1 × 15 = 15 marks)

16. (a) Draw the Plasma Arc Machining (PAM) process and explain its working. Discuss its applications, advantages and limitations over other machining processes.

Or

- (b) Explain the working principle of Magnetic Abrasive Finishing (MAF) with a neat sketch. Discuss how magnetic field strength and abrasive particle characteristics influence surface finish.
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