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**Question Paper Code : 51597**

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2014.

Sixth Semester

Mechanical Engineering

ME 2026/10122 MEE 17/ME 606 — UNCONVENTIONAL MACHINING  
PROCESSES/UNCONVENTIONAL MANUFACTURING PROCESSES

(Regulation 2008/2010)

(Common to PTME 2026 – Unconventional Machining Processes for  
B.E. (Part-Time) Sixth Semester – Mechanical Engineering – Regulation 2009)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. State the need of unconventional machining processes.
2. Write the importance of surface finishing in machining operations.
3. What are the advantages of Ultrasonic machining?
4. Write the formula for material removal rate for ductile and brittle materials in Abrasive Jet Machining (AJM).
5. What are the functions of dielectric fluid used in Electric Discharge Machining (EDM)?
6. Name some of the tool materials used in EDM.
7. What are the main functions of electrolysis in the Electro Chemical Machining (ECM)?
8. What are the parameters that affect the material removal rate in Electro Chemical Grinding?
9. Compare LBM with EBM.
10. Write the advantages of Plasma Arc Machining.

PART B — (5 × 16 = 80 marks)

11. (a) What are the basic factors upon which the unconventional manufacturing processes are classified? Explain.

Or

- (b) What are the basic limitations of conventional manufacturing process? Justify the need of unconventional manufacturing process in today's industries.
12. (a) Explain the variables that are affecting the material removal rate and accuracy of the Abrasive jet machining process.

Or

- (b) Write short notes on the following related to Ultra Sonic Machining (USM) :
- (i) Transducers used in USM machine. (4)
  - (ii) Functions of slurry and oscillator in USM. (4)
  - (iii) Types of abrasives used in USM. (4)
  - (iv) Grain size Vs. Machining rate. (4)

13. (a) Explain the following in Electric Discharge Machining (EDM) with neat sketches :

- (i) Electrode feed control system.
- (ii) Factors to be considered for EDM machine tool selection.

Or

- (b) Explain the following on wire EDM technology :
- (i) Dielectric system (4)
  - (ii) Deionized water (4)
  - (iii) Positioning system (4)
  - (iv) Wire drive system (4)

14. (a) Explain the following on Electro Chemical Machining process with suitable sketches :

- (i) Cathode tool. (8)
- (ii) Correction of tool. (8)

Or

- (b) Compare the Chemical Machining (CHM) with Electro-Chemical Machining (ECM) with respect to their process parameters.
15. (a) Explain the parameters that are affecting the performance of Plasma Arc Machining (PAM).

Or

- (b) With the neat sketch, explain the working principle, construction and process variables for Laser Beam Machining (LBM) process.