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**205ME009**

# Ph.D./M.S.(Engg.) by Research Degree Examination, April/May 2024

# Non Traditional Machining

Time: 3 hrs. Max. Marks: 100

***Note: Answer any FIVE full questions, choosing ONE full question from each module.***





## Module-1

**1** a. Discuss the classification of NTM processes. **(05 Marks)**

b. Explain the process characteristics of NTM processes. **(05 Marks)**

c. With schematic diagram, explain Ultrasonic Machining process. **(10 Marks)**

**OR**

**2** a. With a neat diagram, explain AJM and mechanism of material removal. **(10 Marks)**

b. With schematic diagram, explain water jet machining. **(10 Marks)**

## Module-2

**3** a. Discuss how sparking takes place in EDM process. **(10 Marks)**

b. Explain working of EDM with a neat sketch. **(10 Marks)**

**OR**

**4** a. Discuss the electrochemistry of ECM. **(10 Marks)**

b. Derive an expression for Material Removal Rate (MRR) in ECM. **(10 Marks)**

## Module-3

**5** a. Discuss the factors considered in the selection of (i) etchant (ii) maskant, in chemical machining. **(10 Marks)**

b. Discuss the types of Plasma torches. **(10 Marks)**

**OR**

**6** a. With schematic diagram, explain the EBM process. **(10 Marks)**

b. Discuss the process parameters associated with EBM process. **(10 Marks)**

## Module-4

**7** a. Explain the principle of generation of lasers. **(08 Marks)**

b. Explain the working of $CO_2$ gas laser with a neat sketch. **(12 Marks)**

**OR**

**8** a. Discuss the advantages, limitations and applications of LBM process. **(10 Marks)**

b. Explain Ion Beam Machining process with a neat schematic diagram. **(10 Marks)**

## Module-5

**9** a. With a neat diagram, explain stand off technique in explosion forming process. **(10 Marks)**

b. Explain the contact technique of explosive forming with a neat sketch. **(10 Marks)**

**OR**

**10** a. Explain (i) Swaging and (ii) Expanding in magnetic forming process. **(10 Marks)**

b. Discuss the advantages, limitations and applications of electro-hydraulic forming process. **(10 Marks)**

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