CBCS SCHEME

USN | | | | | | | | | | |

18ME641

Sixth Semester B.E. Degree Examination, Dec.2024/Jan.2025
Non Traditional Machining

Time: 3 hrs. Max. Marks: 100

Note: 1. ***Answer any FIVE full questions, choosing ONE full question from each module.***
2. ***Use neat sketch wherever necessary.***

Module-1

1 a. Define Nontraditional Machining. Discuss the physical parameters of NTM process. **(06 Marks)**

b. What is the difference between conventional and nonconventional machining process. **(08 Marks)**

c. Explain the need of NTM process in modern industry. **(06 Marks)**

OR

2 a. What are the advantages, limitations and applications of nontraditional machining process? **(12 Marks)**

b. How modern machining process are classified? **(08 Marks)**

Module-2

3 a. Explain with neat sketch construction and working of usm process. **(10 Marks)**

b. What are advantages, limitations and applications of Abrasive Jet Machining process? **(10 Marks)**

OR

4 a. Explain with neat sketch AJM process. **(10 Marks)**

b. Explain the following parameters with respect to usm process.
i) Effect of amplitude and frequency of vibration
ii) Effect of grain diameter
iii) Effect of applied static load
iv) Effect of slurry **(10 Marks)**

Module-3

5 a. Draw schematic sketch of Electro Chemical Machining process and discuss the elements of ECM process. **(10 Marks)**

b. Explain the elements of process :
i) Maskants or resists in CHM(Chemical Machining)
ii) Etchants **(10 Marks)**

OR

6 a. Discuss the Economics of ECM Process **(04 Marks)**

b. Calculate the metal removal rate and electrode feed rate when iron is electro chemically machined using copper electrode and sodium chloride solution (Specific resistance = 5.0 ohm.cm), the power supply data of electro chemical machine used are :
Supply voltage = 18 V-DC
- Current = 5000 Amps
- Tool gap = 0.5mm
- Atomic weight of iron is 56
- Valency = 2
- Density = 7.87×10^6 gm/m^3 **(06 Marks)**

c. What are the advantages, disadvantages and applications of Chemical Machining Process (CHM). **(10 Marks)**

Module-4

7 a. Explain the mechanism of metal removal in EDM with a neat sketch. **(06 Marks)**

b. List the application of Plasma Arc Machining (PAM). **(04 Marks)**

c. Mention the properties of dielectric fluid and explain various methods of circulating the dielectric fluid. **(10 Marks)**

OR

8 a. What are the various types of torches used in plasma arc machining? Explain their operation. **(08 Marks)**

b. Explain the word "Plasma". Explain how it is used for material removal process with neat sketch. **(08 Marks)**

c. Discuss the parameter to choose electrode material in EDM process. **(04 Marks)**

Module-5

9 a. Explain the generation and control of electron beam with a neat sketch. Also discuss the material removal process. **(08 Marks)**

b. List the advantages of Laser Beam Machining (LBM). **(06 Marks)**

c. Compare thermal and non-thermal metal removal process in electron beam machining. **(06 Marks)**

OR

10 a. List the limitation of Electron Beam Machining. **(04 Marks)**

b. Explain the principle and operation of Laser beam machining with a neat sketch. **(08 Marks)**

c. Explain the different theories associated with electron beam machining. **(08 Marks)**

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