

B.E/B.TECH Degree Examination, September 2020

Semester - VI

ME16004-Unconventional Machining Processes

(Regulation 2016)

Time: Three hours

Maximum : 80 Marks

Answer **ALL** questions

PART A - (8 X 2 = 16 marks)

1. Sources used in thermal machining are?
 - a. Ions
 - b Plasma
 - c. Electrons
 - d. All of the mentioned
2. _____ is a non-traditional machining processes that depends on the eroding effects of different reagents.
 - (a) Laser -beam machining
 - (b) Abrasive jet machining
 - (c) High speed machining
 - (d) Chemical milling
3. How much amount of wear is present in the tool used in Electrochemical machining?
 - a) No wear
 - b) Low
 - c) Medium
 - d) High
4. The Laser Beam Machining process can be carried out, when the media for energy transfer between tool and workpiece is
 - a. air
 - b. liquid
 - c. vacuum
 - d. any of the above medium
5. State the functions of a “Horn” in Ultrasonic machining
6. What are the properties that are expected from the electrolysis used in the ECM?
7. What is meant by Heat affected zone (HAZ) in EDM?
8. In electron beam machining, why is a high vacuum created in the apparatus?

PART B - (4 X16 = 64 marks)

9. (a) (i) Is unconventional machining process an alternate or complement to conventional machining process? Explain and Justify with any two simple examples. **(08)**
- (ii) How the various process parameters will influence the machining characteristics of Abrasive Jet Machining (AJM)? Justify with simple schematic plots. **(08)**

(OR)

- (b) (i) Explain how material is removed in Ultrasonic Machining (USM) and show diagrammatically the main elements of an USM machine **(08)**
- (ii) Discuss the effect of following parameters on production accuracy and the material removal rate in USM: Amplitude and frequency of vibration, Abrasive grit size, Static load and effect of slurry **(08)**
10. (a) (i) Discuss any three power circuits used in EDM process and their significance. **(08)**
- (ii) Discuss the importance of flushing in EDM process. With simple sketch show the different modes of dielectric feeding to the EDM gap. **(08)**

(OR)

- (b) Illustrate the process of Wire Cut Electric Discharge Machining with a neat sketch and also state the merits and demerits of this process. **(16)**
11. (a) Discuss the three methods of metal removal by electrolyte action in combination with rubbing of work piece in ECG process. Explain with diagram. Also state the main advantages of ECG over conventional grinding and its applications. **(16)**

(OR)

- (b) (i) With suitable sketches, justify the need for the insulation in an Electro Chemical machining (ECM), also mention the operating process parameters and their effects. **(08)**
- (ii) What are the factors on which the selection of a maskant for Chemical machining (CHM) depends? Distinguish between peel maskant and photographic maskant. **(08)**

12. (a) Explain the principle, construction and working of electron beam machining. Also, explain how a complex shape can be cut using Electron beam machining (EBM) process? **(16)**

(OR)

- (b) (i) Discuss about the process capabilities of Laser Beam Machining (LBM) and the process parameters of LBM in improving machining quality. **(08)**
- (ii) Compare Transferred arc type and Non transferred arc type plasma with suitable sketches. **(08)**