

[Total No. of Questions - 8] [Total No. of Printed Pages - 3]
(2064)

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M. Tech 2nd Semester Examination
Non Conventional Machining Processes
PE-207

Time : 3 Hours

Max. Marks : 100

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Attempt any five questions.

1. (a) Describe the technical and economical reasons why Unconventional machining processes are necessary. Provide a sketch showing classification of modern machining processes. (10)
- (b) Before selecting the nature of modern machining processes, explain the important aspects which need to be considered? Describe the characteristic features of modern machining processes that distinguish them from conventional machining processes. (10)
2. (a) Describe various properties required for an electrolyte in Electro chemical machining. And also explain the tool design aspects in Electro chemical machining. (10)
- (b) Explain the principle and operation of chemical machining using sketches. List out the advantages and applications of chemical machining.

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3. (a) Explain the principle of operation of metal removal in electro discharge machining operation. Discuss the effect of following parameters on MRR during EDM (i) Resistance (ii) magnitude of current (iii) Capacitance. (10)
- (b) Discuss the advantages of EDM as compared to other non traditional methods with regard to (a) metal removed rate (b) accuracy and (c) surface finish. (10)
4. (a) Explain mechanism of machining by laser and electron beam. Differentiate between EBM and LBM considering at least five important aspects. (10)
- (b) Compare the edge production in EBM and LBM. What are the factors influencing edge maintenance in both the processes? State few applications of both. (10)
5. (a) Discuss the principle and operation of i) Abrasive jet machining process ii) Whirling jet machining. (10)
- (b) With reference to Ultrasonic machining Explain (i) Transducers used in USM machine (ii) Effect of amplitude of vibration, frequency of vibration and grain size, (iii) Function of slurry, horn, and oscillator, (iv) Types of abrasives used in USM. (10)
6. (a) How the beam power, focus, pulse duration, and mechanical motion is controlled in EBM and How the complex shapes are machined by electron beam? (10)
- (b) Explain the affect of following parameters on the metal removal rate in AJM: (a) Velocity of fluid (b) Design of nozzle (c) Gas pressure. (10)

7. (a) Explain following with respect to Electro discharge machining (i) machining accuracy (ii) Optimization (iii) selection of tool material. (10)
- (b) Explain the basic principle behind the explosive forming. Also state applications of explosive forming. (10)
8. Write briefly
- (i) Laser Beam Process parameters
 - (ii) High Velocity forming methods
 - (iii) Variants of EDM process
 - (iv) Economics of ECM (4×5=20)