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10ME665

Sixth Semester B.E. Degree Examination, Jan./Feb. 2021
Non-Traditional Machining

Time: 3 hrs.

Max. Marks:100

Note: Answer any FIVE full questions, selecting atleast TWO questions from each part.

PART - A

- 1 a. Can "Non Traditional Machining" processes replace conventional process? Justify your answer with reference to the following:
 - i) Technical feasibility. (07 Marks)
 - ii) Economic considerations. (06 Marks)
- b. Explain the need and characteristic features of Non Traditional Machining. (06 Marks)
- c. What do you understand by the term "Ultrasonics"? Explain with simple, sketch, the principle of operation of ultrasonic machining. (07 Marks)
- 2 a. Discuss the effect of the following parameters on the rate of material removal and surface finish obtainable in ultrasonic machining:
 - i) Amplitude and frequency of vibration. (10 Marks)
 - ii) Abrasive grain size. (10 Marks)
 - iii) Static load. (10 Marks)
- b. List out the advantages, disadvantages and applications of USM. (10 Marks)
- 3 a. Sketch the setup for "Abrasive Jet Machining" process. State the main elements of the process and write two important features of each element. (10 Marks)
- b. Explain the following variables that influence the rate of metal removal and accuracy of machining in Abrasive Jet Machining.
 - i) Stand off distance (10 Marks)
 - ii) Abrasive flow rate
 - iii) Nozzle pressure
 - iv) Mixing ratio
- 4 a. Explain with a neat sketch, the Electro Chemical Machining (ECM) process. (08 Marks)
- b. Explain the elements of ECM. (08 Marks)
- c. What are the functions of electrolyte? Mention any two electrolytes used in ECM Process. (04 Marks)

PART - B

- 5 a. Explain the sequence of operation in chemical machining process. (07 Marks)
- b. List the factors to be considered in the selection of etchants in chemical machining. (05 Marks)
- c. Discuss the following in chemical machining process:
 - i) Etchants (08 Marks)
 - ii) Maskants.
- 6 a. Explain the working principle of Electrical Discharge Machining (EDM) with a neat sketch. (10 Marks)
- b. Mention the advantages, disadvantages and applications of EDM. (10 Marks)
- 7 a. With a neat sketch explain briefly the working principle of Plasma Arc Machining. List out the applications of PAM. (10 Marks)
- b. What are general guidelines for designing the torch for PAM process? (10 Marks)
- 8 Write short notes on the following:
 - a) Laser Beam Machining
 - b) Electron Beam Machining
 - c) Dielectric fluids used in EDM. (20 Marks)
 - d) Applications of LBM and EBM

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
 2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.