



P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belagavi)

Sixth Semester, B.E. - Industrial and Production Engineering

Semester End Examination; May/June - 2018

Modern Machining Method

Time: 3 hrs

Max. Marks: 100

Note: Answer **FIVE** full questions, selecting **ONE** full question from each unit.

UNIT - I

- 1 a. Define ultrasonic. Describe the process in which these are used to machine the material. 5
- b. What are the requirements of tool feed mechanism in ultrasonic machining? With schematic representation, explain some types of tool feed systems in ultrasonic machining. 10
- c. Discuss some of the main types of abrasive used in ultrasonic machining. 5
- 2 a. Discuss the hypothesis proposed by miller regarding the mode of material removal in ultrasonic machining and obtain an expression for machining rate. What are the assumptions on which this expression is based? 10
- b. Discuss the effects of the following parameters on the rate of material removal and surface finish obtained in ultrasonic machining : 10
 - i) Amplitude and frequency of vibration
 - ii) Abrasive grit size

UNIT - II

- 3 a. List the applications of abrasive jet machining. 5
- b. Discuss the effects of the following parameters on working accuracy and rate of metal removal in Abrasive Jet machining : 10
 - i) Grain size
 - ii) Jet velocity
 - iii) Stand-off distance
- c. With a schematic, explain the process details of water jet machining. 5
- 4 a. Give the practical application of water jet machining. 5
- b. Give the limitations of laser beam machining. 5
- c. What is laser? How is it used to machine the materials? Give the thermal features of the laser beam machining. 10

UNIT - III

- 5 a. Discuss the parameter associated with the design and operation of the torch that govern the performance of plasma arc machining. 10
- b. Discuss the non-transferred Arc torches and transferred Arc torches. 10
- 6 a. Discuss the generation and control of electron beam. 10
- b. Write short notes on :
 - i) Process capabilities of electron beam machining 10
 - ii) Comparison between thermal and non-thermal features of electron beam machining

UNIT - IV

- 7 a. Write essential features of Dielectric fluid. 5
b. With a schematic, explain the electrode feed control in EDM. 10
c. What is Flushing? Why it necessary? Name the flushing methods. 5
- 8 a. Write a note on the following two parameters that govern the metal removal rate :
i) Supply voltage and Breakdown voltage 8
ii) Charging resistance
- b. With a neat sketch, explain principle application of EDM. 12

UNIT - V

- 9 a. Explain the chemistry behind the electrochemical process. 10
b. With a schematic, explain the electrolytic grinding process. 10
- 10 a. With a schematic, explain the electrolytic honing process and also explain the accuracy and surface finish of the process. 10
- b. Write a short note on :
i) Maskants 10
ii) Etchant

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