



# 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 - 2019**

## Modern Machining Methods

*Time: 3 hrs*

*Max. Marks: 100*

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

### UNIT - I

- |  |                              |
|--|------------------------------|
| 1 a. Distinguish between conventional and non-conventional machining process.  | 7                            |
| b. Briefly classify modern machining methods.  | 5                            |
| c. Describe tool feed mechanism systems used in USM, with sketch.  | 8                            |
| 2 a. Derive an expression for theory of Miller in USM.   | 10                           |
| b. Discuss the effects of following parameters on the rate of material removal and surface finish obtainable in USM: | 10                           |
| i) Effect of amplitude and frequency of vibrations   | ii) Effect of grain diameter |

### UNIT - II

- |   |   |
|---|---|
| 3 a. With a neat sketch, explain the working principle of Abrasive Jet Machining (AJM). | 8 |
| b. List the application of AJM.   | 4 |
| c. Summarize the practical applications of water jet machining.                         | 8 |
| 4 a. With a neat sketch, explain the working principle of water jet machining.          | 8 |
| b. With a neat sketch, explain the working principle of Laser Beam Machining (LBM).     | 8 |
| c. List the advantages and limitations of laser beam machining.                         | 4 |

### UNIT - III

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|---|----|
| 5 a. Explain the mechanism of metal removal in plasma arc machining with help of sketch.  | 10 |
| b. Name the types of torches used in plasma arc machining. Explain in detail.   | 10 |
| 6 a. Explain the principle of generation and control of electron beam in Electron Beam Machining (EBM) with the help of sketch. | 10 |
| b. Comparison between thermal and non-thermal features of electron beam machining.  | 4  |
| c. List the applications, advantages and limitations of EBM.  | 6  |

### UNIT - IV

- |   |    |
|---|----|
| 7 a. With help of sketch, explain the mechanism of metal removal in Electric Discharge Machining (EDM).     | 10 |
| b. What is flushing? Explain the different methods of flushing used in EDM.                                 | 10 |
| 8 a. Describe the factors used for selection of electrode material in EDM.                                  | 6  |
| b. With help of sketch, explain the mechanism of metal removal in Wire Electric Discharge Machining (WEDM). | 10 |
| c. List the applications of wire electric discharge machining (any four).                                   | 4  |

**UNIT - V**

- |       |  |    |
|-------|--|----|
| 9 a.  | With a neat sketch, explain the working principle of Electro Chemical Machining (ECM). | 10 |
| b.    | Describe the chemistry involved in the ECM process with help of sketch.                | 10 |
| 10 a. | With the help of sketch, explain Electro Chemical Grinding process.                    | 10 |
| b.    | Write notes on Resists or Maskants used in chemical machining.                         | 6  |
| c.    | List the advantages and limitations of chemical machining.                             | 4  |

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