Code No: **R1642032** **R16** **Set No. 1**

**IV B.Tech II Semester Regular/Supplementary Examinations, June – 2022**

**UNCONVENTIONAL MACHINING PROCESSES**

**(Mechanical Engineering)**

**Time: 3 hours** **Max. Marks: 70**

***Question paper consists of Part-A and Part-B***
***Answer ALL sub questions from Part-A***
***Answer any FOUR questions from Part-B***

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## PART–A *(14 Marks)*

1. a) What are the basic elements of ultrasonic machining? [3]
   b) What are the economic aspects to be considered for ECM? [3]
   c) What are the dielectric fluids commonly used in EDM process? [2]
   d) Explain the principle of Laser beam? [2]
   e) What are the limitations of plasma arc machining? [2]
   f) List out the applications of water jet machining? [2]

## PART–B *(4x14 = 56 Marks)*

2. a) Explain the factors, which influence the metal removal rate in USM. Explain briefly. [7]
   b) Describe the horn of an ultrasonic machine. [7]

3. a) Comment about surface finish and accuracy in electro-chemical machining. [7]
   b) What are the steps involved in the chemical machining? Explain. [7]

4. a) Explain about the characteristics of spark eroded surfaces. [7]
   b) Explain any four power circuits used for EDM process. [7]

5. a) With the help of line diagram explain the construction, working and applications of electron beam machining. [7]
   b) Compare the difference between electron beam and laser beam machining. [7]

6. a) Describe the Process parameters of PAM and influence on machining quality? Explain. [7]
   b) Explain the metal removal mechanism, applications of plasma in manufacturing industries. [7]

7. a) Explain the influence of nature of abrasives on metal removal rate in abrasive jet machining. [7]
   b) Explain Electro stream drilling. [7]

Code No: **R1642032** **R16** **Set No. 2**

**IV B.Tech II Semester Regular/Supplementary Examinations, June – 2022**

# UNCONVENTIONAL MACHINING PROCESSES

**(Mechanical Engineering)**

**Time: 3 hours** **Max. Marks:70**

***Question paper consists of Part-A and Part-B***
***Answer ALL sub questions from Part-A***
***Answer any FOUR questions from Part-B***

*****

## PART–A *(14 Marks)*

| | | | |
|---|---|---|---|
| 1. | a) | What is non-traditional machining methods? | [3] |
| | b) | Write the application of electrochemical deburring? | [3] |
| | c) | Name some of the tool material used in EDM? | [2] |
| | d) | Comment about accuracy of cut in electron beam machining | [2] |
| | e) | Explain the principle of Plasma arc machining? | [2] |
| | f) | Name different gases used in AJM? | [2] |

## PART–B *(4x14 = 56 Marks)*

| | | | |
|---|---|---|---|
| 2. | a) | How to classify modern machining process? | [7] |
| | b) | Explain the basic mechanism of metal removal in ultrasonic machining. | [7] |
| 3. | a) | Write a short note on electro chemical honing process. | [7] |
| | b) | Briefly explain the process of electro chemical grinding. | [7] |
| 4. | a) | Explain the basic mechanism of metal removal in electric discharge machining. | [7] |
| | b) | Write a short note on selection of tool electrode and dielectric fluids in EDM. | [7] |
| 5. | a) | Explain the mechanism of metal removal in electron beam machining. | [7] |
| | b) | List out the applications for Laser beam machining. | [7] |
| 6. | a) | Explain the process parameters of plasma machining. | [7] |
| | b) | What are the different modes of operation of plasma torches? Explain. | [7] |
| 7. | a) | Explain the mechanism of material removal for Abrasive Jet Machining. | [7] |
| | b) | Write a short note on magnetic abrasive finishing. | [7] |

Code No: **R1642032** **R16** **Set No. 3**

**IV B.Tech II Semester Regular/Supplementary Examinations, June – 2022**

**UNCONVENTIONAL MACHINING PROCESSES**

**(Mechanical Engineering)**

**Time: 3 hours** **Max. Marks: 70**

***Question paper consists of Part-A and Part-B***
***Answer ALL sub questions from Part-A***
***Answer any FOUR questions from Part-B***

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## PART–A *(14 Marks)*

1. a) Differentiate the conventional and unconventional machining processes in terms of principles. [3]
   b) What are the applications of chemical machining? [3]
   c) What factors are to be considered for the selection of tool material in electric discharge machining? [2]
   d) What are the process parameters involved in Laser beam machining? [2]
   e) What are the applications of plasma in manufacturing industries? [2]
   f) Why WJM is not suitable for brittle materials? Explain [2]

## PART–B *(4x14 = 56 Marks)*

2. a) Explain the process of USM and list any two of its advantages, limitations and applications. [7]
   b) What are the main parameters to be considered while selecting a particular process? Why? [7]

3. a) Describe the chemistry involved in ECM process. [7]
   b) List out the applications, advantages and disadvantages of ECM process. [7]

4. a) What is flushing in EDM process? Explain about various flushing techniques. [7]
   b) Explain the mechanism of material removal process of EDM. [7]

5. a) What are the working principle and the applications of electron beam machining process? Diagrammatically show the electron beam machining system. [7]
   b) Explain the mechanism of material removal process of Laser Beam Machining. [7]

6. a) Explain the surface finish obtained in PAM. [7]
   b) Explain with a figure about the Plasma arc torch. [7]

7. a) Write the names of various elements of Abrasive water jet machining and explain them in brief. [7]
   b) Write a short note on Shaped Tube Electrolytic Machining. [7]

Code No: **R1642032** **R16** **Set No. 4**

**IV B.Tech II Semester Regular/Supplementary Examinations, June – 2022**

**UNCONVENTIONAL MACHINING PROCESSES**

**(Mechanical Engineering)**

**Time: 3 hours** **Max. Marks:70**

***Question paper consists of Part-A and Part-B***
***Answer ALL sub questions from Part-A***
***Answer any FOUR questions from Part-B***

*****

## PART–A *(14 Marks)*

| | | | | |
|---|---|---|---|---|
| 1. | a) | What is meant by the term non-traditional machining? | [3] |
| | b) | Give the electro-chemistry associated with electro-chemical machining? | [3] |
| | c) | What is wire EDM? | [2] |
| | d) | What are the applications of Laser beam machining? | [2] |
| | e) | Write the various types of torches used in plasma arc machining? | [2] |
| | f) | List the applications of shaped tube electrolytic machining. | [2] |

## PART–B *(4x14 = 56 Marks)*

| | | | |
|---|---|---|---|
| 2. | a) | Describe the structure of the transducer in an ultrasonic machine. | [7] |
| | b) | Explain economic considerations in USM. | [7] |
| 3. | a) | Explain the principle and working of electro chemical machining with a neat sketch. | [7] |
| | b) | What are the various electro chemical processes used for material removal? Enumerate the principle differences in working in these processes. | [7] |
| 4. | a) | With the help of a line diagram explain the working of electric discharge grinding. | [7] |
| | b) | Derive an expression for determining the surface finish in EDM process. | [7] |
| 5. | a) | Write four specific applications where you feel that EBM should be the preferable choice. | [7] |
| | b) | Sketch the electron beam gun and explain the function of each part. | [7] |
| 6. | a) | Explain the metal removal mechanism of Plasma Machining. | [7] |
| | b) | Describe the various elements used in plasma arc cutting system. How the performance of the process is measured. | [7] |
| 7. | a) | Explain the mechanism of material removal for water Jet Machining. | [7] |
| | b) | Write a short note on abrasive flow finishing. | [7] |