

Code No: **RT41034****R13****Set No. 1****IV B.Tech I Semester Regular/Supplementary Examinations, Oct/Nov 2018****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 THREE questions from Part-B*

PART-A (22 Marks)

- 1 a) Name any four materials that are difficult-to-machine. [4]
- b) What is the difference between ECG and conventional grinding? [4]
- c) Explain the function of servo-mechanism in EDM. [3]
- d) What are the applications of electron beam machining? [3]
- e) What are the types of plasma arc torches? [4]
- f) Reuse of abrasives is not recommended in AJM. Why? [4]

PART-B (3x16 = 48 Marks)

- 2 a) Explain the types of energy sources used in Unconventional Machining Processes. [8]
- b) Write the advantages, disadvantages and limitations of USM process. [8]
- 3 a) Briefly discuss the economics of ECM process. [8]
- b) Sketch and explain electro chemical honing process [8]
- 4 a) Comment about the nature of spark eroded surfaces. [8]
- b) Explain the functions and characteristics of dielectric fluid used in EDM process. [8]
- 5 a) Sketch and explain the generation and control of electron beam used in EBM process. [8]
- b) State the mechanism of metal removal, merits and demerits of laser beam machining process. [8]
- 6 a) Explain process parameters and process characteristics of PAM process. [8]
- b) Describe non-transferred and transferred modes of Plasma arc. [8]
- 7 a) Explain the working of an Abrasive Jet Machine with the help of a neat sketch. [8]
- b) In what aspects electro stream drilling is different from conventional ECM process. [8]

Code No: **RT41034****R13****Set No. 2****IV B.Tech I Semester Regular/Supplementary Examinations, Oct/Nov 2018****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 THREE questions from Part-B************PART-A (22 Marks)**

- 1 a) What are the types of abrasives used in USM? [4]
- b) Analyze the chemical machining process with a flow chart. [4]
- c) What are the functions of dielectric fluid in EDM process? [3]
- d) List out various types of lasers used in LBM process [3]
- e) What is the basic heating phenomenon that takes place in plasma arc machining? [4]
- f) Write four applications (component names) of AFM process. [4]

PART-B (3x16 = 48 Marks)

- 2 a) What are the considerations of process selection and applications of UCMP? [8]
- b) Write short notes on the following related to ultrasonic machining (USM):
 - (i) Functions of slurry and oscillator in USM
 - (ii) Grain size Vs. Machining rate. [8]
- 3 a) Discuss different process parameters of electro chemical machining process. [8]
- b) List out the applications and advantages of chemical machining process. [8]
- 4 a) List the Process parameters of EDM and explain their significance in machining. [8]
- b) What are the basic requirements of tool materials in EDM process? Name any four tool materials. [8]
- 5 a) Why is EBM carried out in vacuum? Explain the process with a neat sketch. [8]
- b) What are the unique characteristics a Laser machining technique possesses that make it the only choice for the job? [8]
- 6 a) Discuss the factors that influence the quality of the cut in plasma arc machining. [8]
- b) With the help of suitable diagrams explain the use of various modes of plasma for various purposes in industry. [8]
- 7 a) Describe briefly the elements of abrasive flow finishing process giving a neat sketch. [8]
- b) List out the materials of abrasives and nozzles used in Abrasive jet machining process. [8]

Code No: **RT41034****R13****Set No. 3****IV B.Tech I Semester Regular/Supplementary Examinations, Oct/Nov 2018****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 THREE questions from Part-B*

PART-A (22 Marks)

- 1 a) Explain the importance of MRR in machining. [4]
- b) List out the different types of Maskants used in chemical machining. [4]
- c) Explain the term "Sinking" in Electro Discharge Machining Method. [3]
- d) Summarize difference between EBM and LBM. [3]
- e) What is meant by "Fourth state of matter" in Plasma Arc Machining (PAM)? [4]
- f) List the process variables which affect the MRR in Abrasive Jet Machining (AJM). [4]

PART-B (3x16 = 48 Marks)

- 2 a) Discuss the classification of Unconventional Machining Processes. [8]
- b) Discuss the effect of various process parameters on material removal rate (MRR) and accuracy of the machined work piece. [8]
- 3 a) Describe various process parameters affecting ECM. [8]
- b) Explain the chemistry in ECM process. [8]
- 4 a) For an electrical discharge machining process discuss the following: [8]
(i) Dielectric system and (ii) Electrodes.
- b) List the commonly used dielectric fluids in EDM process. What properties should they possess? [8]
- 5 a) Explain the production of Laser beam. [8]
- b) Explain process parameters, advantages and limitations of Electron beam machining. [8]
- 6 a) Explain the types of plasma arc torches used in Plasma Arc Machining. [8]
- b) Discuss the metal removal mechanism in Plasma Arc Machining. [8]
- 7 a) Explain in detail working principle of shaped tube electrolytic machining. [8]
- b) State the advantages, limitations and applications of abrasive flow finishing. [8]

Code No: **RT41034****R13****Set No. 4****IV B.Tech I Semester Regular/Supplementary Examinations, Oct/Nov 2018****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 THREE questions from Part-B*

PART-A (22 Marks)

- 1 a) Draw a typical graph showing the relation between MRR and Power consumption. [4]
- b) Write the functions of an electrolyte. [4]
- c) List the factors which govern the MRR in Electro Discharge Machining (EDM). [3]
- d) Explain briefly how material is removed in EBM process. [3]
- e) Enumerate various process parameters of PAM. [4]
- f) What are the materials used for nozzle manufacturing in AJM process? [4]

PART-B (3x16 = 48 Marks)

- 2 a) Briefly discuss the mechanisms involved in material removal by USM. [8]
- b) Explain the various parameters influencing the MRR in USM process. [8]
- 3 a) Explain the principle of electrochemical grinding with neat sketch. [8]
- b) Elaborate the electrochemistry of the ECM process.. [8]
- 4 a) Explain with help neat sketches any two types of flushing methods in EDM process. [8]
- b) Explain the metal removing mechanism in Electro Discharge Machining process. [8]
- 5 a) Explain the construction and working of LBM. [8]
- b) Compare EBM and LBM on the following aspects:
(i) Machining rate
(ii) Tool wear rate
(iii) Accuracy. [8]
- 6 a) Discuss the surface finish and tolerances obtained in PAM. [8]
- b) List the applications plasma in machining. [8]
- 7 a) Explain with neat sketch, working of Electro stream drilling. [8]
- b) Compare magnetic abrasive finishing and abrasive flow finishing. [8]