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
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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

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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:
(i) Dielectric system and (ii) Electrodes. [8]
b) List the commonly used dielectric fluids in EDM process. What properties should they posses? [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
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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]