Code No: R193203C **R19** **SET - 1**

III B. Tech II Semester Regular Examinations, June-2022

UNCONVENTIONAL MACHINING PROCESSES

(Mechanical Engineering)

Time: 3 hours Max. Marks: 75

Answer any **FIVE** Questions **ONE** Question from **Each unit**
All Questions Carry Equal Marks
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UNIT-I

1.	a)	Discuss the factors that influence the selection of unconventional machining over conventional machining.	[8M]
	b)	Explain the function of a transducer and different types of transducers that are used in USM process.	[7M]
		(OR)	
2.	a)	Discuss in detail about the economic considerations of Ultrasonic machining process.	[8M]
	b)	Explain the characteristics of Non-traditional machining methods and its advantages.	[7M]

UNIT-II

3.	a)	Briefly discuss the effect of various process parameters on the machining characteristics of AJM process.	[8M]
	b)	Discuss the advantages and disadvantages of AWJM.	[7M]
		(OR)	
4.	a)	Explain the material removal process in AWJM with neat sketch.	[8M]
	b)	Discuss the working process of water jet machining system.	[7M]

UNIT-III

5.	a)	Explain the main functions of electrolyte used in ECM process and list the commonly used electrolytes.	[8M]
	b)	What are the advantages and disadvantages of Electro chemical grinding?	[7M]
		(OR)	
6.	a)	Estimate the MRR and electrode feed rate when Iron (density = 7.87 gm/cm^3) is electrochemically machined, using copper electrode and sodium chloride solution (specific resistance = 5.0 ohm cm). Consider power supply voltage 18V D.C, current is 5000 amp, tool-work gap is 0.5 mm (constant).	[8M]
	b)	Discuss the applications and limitations of ECM process.	[7M]

UNIT-IV

7. a) Explain about the selection of different types of electrode materials used in EDM process. [8M]
   b) Illustrate the capabilities and applications of wire EDM process. [7M]

(OR)

8. a) Describe the working principle of wire EDM process. [8M]
   b) Discuss any three power circuits used for EDM process. [7M]

UNIT-V

9. a) Discuss why the EBM process is carried out in vacuum. And also write its applications. [8M]
   b) Enlist the various process parameters and their effect in LBM process. [7M]

(OR)

10. a) With a neat sketch explain the working principle of laser beam machine. [8M]
    b) Discuss the metal removal mechanism in Plasma Machining. [7M]

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Code No: R193203C **R19** **SET - 2**

III B. Tech II Semester Regular Examinations, June-2022

UNCONVENTIONAL MACHINING PROCESSES

(Mechanical Engineering)

Time: 3 hours Max. Marks: 75

Answer any **FIVE** Questions **ONE** Question from **Each unit**
All Questions Carry Equal Marks
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UNIT-I

1.	a)	Compare non-traditional machining and traditional machining methods.	[8M]
	b)	List the various process parameters and explain their effect on MRR and surface finish obtained in USM process.	[7M]
		(OR)	
2.	a)	Explain the function of major components of USM equipment with neat sketch.	[8M]
	b)	What is the need for non-traditional machining methods? And also write its applications.	[7M]
		UNIT-II	
3.	a)	Describe briefly the working of abrasive flow finishing process.	[8M]
	b)	Discuss the applications and process capabilities of AJM process.	[7M]
		(OR)	
4.	a)	Explain the effect of process parameters in WJM process.	[8M]
	b)	With a neat sketch explain the working process of AWJM.	[7M]
		UNIT-III	
5.	a)	In an electrochemical machining process a square hole of 5 mm dimension was drilled in a copper block. If the current used is 5000 A. Atomic weight of copper is 63 and valance of dissolution is 1. Calculate the MRR in gm/s. And also estimate the machining time if the depth of the hole is 6 mm.	[8M]
	b)	Explain the working process of electro chemical grinding.	[7M]
		(OR)	
6.	a)	Explain the material removal mechanism in ECM process.	[8M]
	b)	Discuss about economic aspects of ECM process.	[7M]
		UNIT-IV	
7.	a)	Explain the functions and desirable properties of dielectric fluid used in EDM process.	[8M]
	b)	Discuss the applications and disadvantages of EDM process.	[7M]

(OR)

8. a) Illustrate the characteristics of EDM process. [8M]
   b) Explain about the electric discharge grinding process. [7M]

UNIT-V

9. a) Differentiate electron beam machining and laser beam machining processes. [8M]
   b) Discuss the characteristics of laser beam machining process. [7M]

(OR)

10. a) Explain the mechanism of material removal in EBM process. What are its applications? [8M]
    b) Discuss about the accuracy and surface finish obtained in PAM. [7M]

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Code No: R193203C **R19** **SET - 3**

III B. Tech II Semester Regular Examinations, June-2022

UNCONVENTIONAL MACHINING PROCESSES

(Mechanical Engineering)

Time: 3 hours Max. Marks: 75

Answer any **FIVE** Questions **ONE** Question from **Each unit**
All Questions Carry Equal Marks
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UNIT-I

1. a) Classify the unconventional machining process and list the considerations of process selection. [8M]
   b) Discuss the applications, advantages and disadvantages of USM process. [7M]

(OR)

2. a) With a neat sketch explain the mechanism of material removal in Ultra Sonic Machining. [8M]
   b) Discuss the drawbacks of conventional machining methods and how they overcome by unconventional machining. [7M]

UNIT-II

3. a) Explain the working principle of AJM process with a neat sketch. [8M]
   b) Write the differences between Water Jet Machining and Abrasive Water Jet Machining. [7M]

(OR)

4. a) Explain the effect of process variables of AJM that influences MRR. [8M]
   b) Discuss the advantages and disadvantages of WJM. [7M]

UNIT-III

5. a) Discuss the factors to be considered while choosing an electrolyte in ECM process and also list the various electrolytes used in ECM process. [8M]
   b) Discuss the advantages and limitations of ECM process. [7M]

(OR)

6. a) Estimate the MRR and electrode feed rate when Iron (density = 7.87 gm/cm^3) is electrochemically machined, using copper electrode and sodium chloride solution (specific resistance = 5.0 ohm cm). Consider power supply voltage 18V D.C, current is 5000 amp, tool-work gap is 0.5 mm (constant). [8M]
   b) Discuss about the Electro chemical deburring process. [7M]

UNIT-IV

7. a) Discuss about the dielectric medium and electrodes that are used in EDM process. [8M]
   b) Distinguish wire cut EDM and conventional EDM processes [7M]

(OR)

8. a) Illustrate the function of electrode feed control system used in EDM process. [8M]
   b) Explain the working process of electric discharge grinding with neat sketch. [7M]

UNIT-V

9. a) Distinguish between transferred and non-transferred arc type used in PAM process. [8M]
   b) Explain the effect of various process parameters in EBM process. [7M]

(OR)

10. a) Discuss about the main elements and their functions used in LBM process. [8M]
    b) List the process parameters and explain their effect on accuracy and surface finish obtained in PAM process. [7M]

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Code No: R193203C **R19** **SET - 4**

III B. Tech II Semester Regular Examinations, June-2022

UNCONVENTIONAL MACHINING PROCESSES

(Mechanical Engineering)

Time: 3 hours Max. Marks: 75

Answer any **FIVE** Questions **ONE** Question from **Each unit**
All Questions Carry Equal Marks
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UNIT-I

1. a) Discuss the advantages, disadvantages and applications of non-traditional machining methods. [8M]
   b) Write about the different types of abrasives used in USM process. [7M]

(OR)

2. a) With a neat sketch explain the working process of ultrasonic machining method. [8M]
   b) Discuss the limitations of conventional machining process that can be achieved by unconventional machining methods. [7M]

UNIT-II

3. a) Discuss about the materials of abrasives, nozzles and carrier gas used in AJM process. [8M]
   b) Distinguish WJM and AWJM processes. [7M]

(OR)

4. a) Explain the mechanism of material removal in WJM and AWJM processes. [8M]
   b) Discuss the advantages and limitations of Abrasive Jet Machining. [7M]

UNIT-III

5. a) Describe the working principle of ECM process. [8M]
   b) Explain how the machining voltage, feed rate and temperature of electrode will affect the accuracy of surface produced in ECM process. [7M]

(OR)

6. a) In an electrochemical machining process a square hole of 5 mm dimension was drilled in a copper block. If the current used is 5000 A. Atomic weight of copper is 63 and valance of dissolution is 1. Calculate the MRR in gm/s. And also estimate the machining time if the depth of the hole is 6 mm. [8M]
   b) Discuss about the working process of Electro chemical honing process. [7M]

UNIT-IV

7. a) Explain the basic requirements of tool material used in EDM process and list some of tool materials. [8M]
   b) Illustrate the capabilities and applications of wire EDM process. [7M]

(OR)

8. a) List and explain the effect of various process parameters in the EDM process. [8M]
   b) What is flushing in EDM process? Discuss about the various flushing techniques. [7M]

UNIT-V

9. a) Explain the principle and operation of plasma machining, and its applications. [8M]
   b) Illustrate the advantages and disadvantages of LBM process. [7M]

(OR)

10. a) Discuss about the commonly used lasers in LBM process? And write the advantages of LBM process. [8M]
    b) With neat sketch explain the working principle of EBM process. [7M]

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