

**P.E.S. College of Engineering, Mandya - 571 401***(An Autonomous Institution affiliated to VTU, Belagavi)***Sixth Semester, B.E. - Mechanical Engineering****Semester End Examination; August - 2023****Non-Traditional Machining**

Time: 3 hrs

Max. Marks: 100

**Course Outcomes***The Students will be able to:**CO1: Explain the concept of nontraditional machining process and ultrasonic machining process.**CO2: Describe the process of electric discharge machining and jet machining process.**CO3: Explain the working principle of chemical and electrochemical machining process.**CO4: Describe the working principle of laser beam and Ion beam machining process.**CO5: Analyze the effect of parameters and process characteristics of plasma arc and electron beam machining process.***Note: I) PART - A is compulsory. Two marks for each question.****II) PART - B: Answer any Two sub questions (from a, b, c) for a Maximum of 18 marks from each unit.**

Q. No.	Questions	Marks	BLs	COs	POs
<b>I : PART - A</b>		<b>10</b>			
1 a.	Define MRR.	2	L1	CO1	PO1
b.	List three main advantages, application of EDM process.	2	L2	CO2	PO1
c.	Briefly explain the principle behind ECM process.	2	L1	CO3	PO1
d.	Enumerate the application of high velocity forming process.	2	L1	CO4	PO1
e.	Explain briefly safety precaution to be followed in PAM.	2	L2	CO5	PO1
<b>II : PART - B</b>		<b>90</b>			
<b>UNIT - I</b>		<b>18</b>			
2 a.	Explain the need for nontraditional machining process in industries.	9	L2	CO1	PO3
b.	With a neat sketch, explain any two tools feed mechanisms employed in USM.	9	L2	CO1	PO1
c.	Illustrate the effect of various process parameters on MRR in USM process.	9	L3	CO1	PO3
<b>UNIT - II</b>		<b>18</b>			
3 a.	With the help of a neat sketch, explain mechanism of metal removal in EDM process.	9	L2	CO2	PO1
b.	Explain the working principle of R.C type circuit used in EDM equipment.	9	L2	CO2	PO2
c.	Explain how water Jet is used to remove material from a work piece.	9	L2	CO2	PO1
<b>UNIT - III</b>		<b>18</b>			
4 a.	Explain the process involved in chemical blanking.	9	L2	CO3	PO2
b.	Enumerate the advantages, disadvantages, application of CHM.	9	L2	CO3	PO1
c.	Describe electrochemical Honing process with a neat sketch	9	L3	CO3	PO1

**UNIT - IV**

**18**

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|------|--|---|----|-----|-----|
| 5 a. | Explain how laser is used in metal cutting industries? | 9 | L2 | CO4 | PO2 |
| b.   | With the help of a neat sketch, explain IBM process.   | 9 | L2 | CO4 | PO3 |
| c.   | Explain explosion forming process.                     | 9 | L2 | CO4 | PO2 |

**UNIT - V**

**18**

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|------|---|---|----|-----|-----|
| 6 a. | With a neat sketch, explain PAM process and also mention its application. | 9 | L2 | CO5 | PO2 |
| b.   | Explain the different PAM parameters that govern the performance.         | 9 | L2 | CO5 | PO2 |
| c.   | With a neat sketch, electron beam machining process.                      | 9 | L2 | CO5 | PO2 |

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