

**BACHELOR OF PRODUCTION ENGG. EXAMINATION, 2022**  
(3rd Year-2nd Semester)

**SUBJECT – NON-TRADITIONAL MACHINING**

Time: Three hours

**PART-I ( 50 Marks)**  
(Use a separate Answer-Script)

Full Marks: 100

No of Questions		Marks
<b><u>Answer Question no. 1 and any two from the following</u></b>		
1	<p>Answer any four from the following:</p> <p>(i) What is 'Non-Traditional Machining (NTM) Processes'? Identify and explain some of the major reasons for the development of NTM processes.</p> <p>(ii) Discuss various physico-chemical and thermal phenomena that occur in the gap between workpiece and tool during Electrochemical Machining (ECM) operation.</p> <p>(iii) Differentiate between electrolyte and dielectric. Explain their applications in non-traditional machining processes.</p> <p>(iv) What are the limitations of the R-C circuit? How the controlled pulse generator circuit can overcome these?</p> <p>(v) Explain the function of dielectric in EDM. What is Hybrid Machining? Give example.</p>	5 5 5 5
2.	<p>(a) Explain in brief a typical electrochemical machining plant consisting of various subsystems with a sketch.</p> <p>(b) Starting from the fundamental principles of Electrochemical Machining (ECM), deduce the mathematical formulation of electrolyte flow velocity in the machining zone for avoiding the overheating of electrolyte due to heat generation by the flow of electric current during electrochemical machining operation. Assume all the heat generated will be remain in the electrolyte only.</p>	7 8
3.	<p>(a) In brief describe a typical EDM system with a neat sketch.</p> <p>(b) What are the limitations of the R-C circuit in EDM? How these can be overcome by the controlled pulse generator circuit?</p>	8 7
4.	<p>(a) Explain in brief different features of Wire-cut EDM.</p> <p>(b) Why de-ionized water is used as dielectric in WEDM? What is stratified wire?</p>	8 4+3

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## B. E. PRODUCTION ENGINEERING THIRD YEAR SECOND SEMESTER EXAMINATION 2022

## NON-TRADITIONAL MACHINING

Full Marks:100

Time: Three Hours

Part-II  
(50 Marks)

Use Separate Answer scripts for each part.

*Answer Question 1 and any TWO Questions from the rest.*

1. a) Classify energy beam based advanced machining processes.  
 b) Distinguish between AJM and AWJM.  
 c) How is Laser beam different for ordinary torch light?  
 d) What are the types and the function of catcher used in WJM?  
 e) What are the applications of LBM?  
 f) Distinguish between ECM and ECDM.  
 g) Why is vacuum needed in EBM?  
 h) Differentiate between Transferred Arc and Non-Transferred Arc Plasma Cutting system.  
 i) What are the types Transducer used for USM?  
 j) What are the types of abrasives used in USM?  
(10 x 2)
  
2. a) Discuss on various elements of Abrasive Water Jet Machining (AWJM) System.  
 b) What are the effects of process parameters on performances in AJM?  
 c) What are the applications and limitations of WJM?  
(5+6+4)
  
3. a) Discuss on mechanism of material removal in USM.  
 b) What are the types of horns and their functions in USM?  
 c) What are the various process parameters and machining criteria in USM?  
(6+4+5)
  
4. a) Discuss on the Nd:YAG Laser beam machining system with sketch.  
 b) What are the advantages and limitations of Laser Beam Machining (LBM)?  
(10+5)
  
5. a) Discuss on various elements of Plasma Arc Machining System with sketch.  
 b) Discuss on applications of Electron Beam Machining (EBM).  
(10+5)