**TECHNO INDIA NJR INSTITUTE OF TECHNOLOGY, UDAIPUR**

B. TECH 3rd – YEAR (V SEM.) – MT-I

Manufacturing Technology (**5ME4-03**)

Time: 3 Hr Max. Marks: 120

**Note:**

1. The paper is divided into 3 parts: Part-A, Part-B and Part-C.
2. Part-A contains 5 questions and carries 4 mark each.
3. Part-B contains 5 questions. Each question is having two options and carries 8 marks each.
4. Part-C contains 2 questions. Each question is having two options and carries 30 marks each.

Part- A (20 Marks)

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| 1. Why Metal Removal Process is the most expensive among the other manufacturing Process? | CO1 |
| 1. Explain the term “Machine Tool” and how it is different from a machine? | CO1 |
| 1. Classify various metal removal Processes. | CO1 |
| 1. What is rake angle? How does it affect the cutting process? | CO2 |
| 1. Compare HSS and Cemented carbide cutting tool material. | CO2 |

Part- B (40 Marks) Attempt any Five Questions.

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| 1. Explain the chip Formation and types of chips with neat diagram. | CO1 |
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| 1. Derive an expression of shear force in orthogonal cutting with neat figure. | CO1 |

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| 1. What is magnetic Pulse forming? | CO1 |
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| 1. What is the high velocity forming method? Explain any one method. | CO1 |

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| 1. what are the conditions for using zero rake angle during metal cutting operation? | CO2 |
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| 1. In orthogonal cutting operations, the 0.250 in wide tool has a rake angle of 5 deg. The lathe is set so the chip thickness before the cut is 0.010 in. After the cut , the deformed chip thickness is measured to be 0.027 in . Calculate a) the shear plane angle and b) the shear strain for the operation. | CO2 |

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| 1. In a turning operation on stainless steel with hardness = 200 HB, the cutting speed = 200 m/min , feed = 0.25 mm/ rev, and depth of cut = 7.5 mm. how much power will the lathe draw in performing this operation if its mechanical efficiency = 90% From table , U= 2.8 N-m/ mm3 | CO2 |

Part- C (60 Marks) Attempt any Two Questions.

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| 1. Derive expressions for the cutting ratio. Also draw Merchants’ circle Diagram and show forces angle acting on cutting tool and different parameter involved in metal cutting. | CO1 |
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| 1. In an orthogonal cutting operation on a material with the shear yield strength if 250 N/mm2 the following data is obtained Rake angle = 15   . Uncut chip thickness = 0.25 mm, width of chip = 2 mm. chip thickness ratio = 0.46, friction angle = 40 deg. Determine the shear angle component and resultant force on the tool. | CO1 |

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| 1. Explain the basic for the selection of a specific cutting fluid for a given application. Take the example of turning , milling and grinding, and suggest the type of cutting fluid used. | CO1 |