

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)

B.Tech III Year I Semester Supplementary Examinations June-2024

MACHINE TOOLS

(Mechanical Engineering)

Time: 3 Hours

Max. Marks: 60

(Answer all Five Units 5 x 12 = 60 Marks)

UNIT-I

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|---|---|--|-----|----|----|
| 1 | a | How can you classify cutting tools? | CO1 | L1 | 6M |
| | b | Define the single point cutting tool elements. | CO1 | L1 | 6M |

OR

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|---|---|---|-----|----|----|
| 2 | a | Derive the equation for chip thickness ratio and shear plane angle. | CO1 | L3 | 6M |
| | b | What factors influence the formation of the built up edge and give the factors to decrease the built up edge? | CO1 | L2 | 6M |

UNIT-II

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|---|---|---|-----|----|----|
| 3 | a | Discuss about Merchant theory and derive the equation for minimum cutting force. | CO2 | L2 | 6M |
| | b | In orthogonal turning of a 60 mm diameter MS bar on a lathe, the following data were obtained: Rake angle 10°, cutting speed 120 m/min, feed 0.3mm/rev, cutting force 170 kg, feed force 65kg. Calculate the shear plane angle, coefficient of friction, cutting power, chip flow velocity and shear force, if chip thickness is 0.4mm. | CO2 | L3 | 6M |

OR

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| 4 | | Discuss tool failure and wear mechanism in cutting tool. | CO2 | L2 | 12M |
|---|--|--|-----|----|-----|

UNIT-III

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| 5 | | Draw the engine lathe and label the parts. Discuss the functions of the lathe parts. | CO3 | L2 | 12M |
|---|--|--|-----|----|-----|

OR

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|---|---|---|-----|----|----|
| 6 | a | Explain the advantages and disadvantages of a turret lathe. | CO4 | L2 | 6M |
| | b | What is meant by tool layout of a turret lathe? | CO4 | L2 | 6M |

UNIT-IV

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|---|---|--|-----|----|----|
| 7 | a | Name the types of cutters, work holding and tool holding devices used in drilling machine. | CO5 | L1 | 6M |
| | b | Explain briefly with sketches any four of the drilling operations. | CO5 | L2 | 6M |

OR

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|---|---|---|-----|----|----|
| 8 | a | Give the comparison between planer, shaper and slotter. | CO5 | L4 | 6M |
| | b | What are the advantages of planer? | CO5 | L1 | 6M |

UNIT-V

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|---|---|---|-----|----|----|
| 9 | a | What is a 'grinding wheel'? What are the grinding wheel parameters that influence the grinding performance? | CO6 | L1 | 6M |
| | b | What is a 'bond'? Name and explain principle bonds. | CO6 | L1 | 6M |

OR

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| 10 | | With neat sketch, explain the construction of surface grinding machine | CO6 | L2 | 12M |
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