Q.P. Code: 19ME0312 **R19**

Reg. No: | | | | | | | | | | |

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech III Year I Semester Regular Examinations December-2021

MACHINE TOOLS

(Mechanical Engineering)

Time: 3 hours Max. Marks: 60

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

UNIT-I

1	a	Explain the importance and functions of different tool angles associated with the geometry of a single point cutting tool with neat sketch	L2	6M
	b	Explain the formation of chip. Discuss the types of chips with neat sketches	L2	6M
		OR		
2	a	What factors influence the formation of the built up edge and give the factors to decrease the built up edge?	L2	6M
	b	Explain briefly orthogonal and oblique cutting with neat sketch.	L2	6M

UNIT-II

3	a	The following equation for tool life is given for a turning operation $VT^{0.13} f^{0.77} d^{0.37} = C$. A 60 minute tool life was obtained while cutting at V=30 m/min, feed =0.3 mm/rev and depth of cut = 2.5 mm. Determine the change in tool life if the cutting speed, feed and depth of cut an increased by 20% individually and also taken together.	L3	6M
	b	Draw a Merchant's circle diagram and derive expressions to show relationships among the different forces acting on the cutting tool and coefficient of friction.	L2	6M
		OR		
4	a	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.	L3	6M
	b	Give the broad classification of cutting fluids and explain them briefly.	L2	6M

UNIT-III

5	a	Discuss about the lathe attachments with neat sketches	L2	6M
	b	List the Turret lathe operations and explain any one operation with neat sketch	L1	6M
		OR		
6	a	Briefly explain the Single spindle and multi spindle automatic lathes	L2	6M
	b	Define the working principle of lathe. How the lathe is specified?	L1	6M

UNIT-IV

7	a	Explain briefly plain indexing and differential indexing with suitable example.	L2	6M
	b	Explain briefly Up-milling process and Down milling process	L2	6M
		OR		
8	a	What do you understand by the term "Boring"? How are boring machines classified?	L2	6M

	b	Explain briefly with sketches any four of the drilling operations.	L2	6M

UNIT-V

9	a	What is a 'grinding wheel'? What are the grinding wheel parameters that influence the grinding performance?	L1	6M
	b	How are broaching machines classified?	L2	6M

OR

10	a	Compare the center and center-less grinding machine.	L1	6M
	b	Write short notes on: i) Silicon carbide ii) Aluminium oxide iii) Abrasive size	L2	6M

*** END ***