CBCS SCHEME

USN | | | | | | | | | | 17ME45B/17MEB405

Fourth Semester B.E. Degree Examination, Feb./Mar.2022
Machine Tools & Operations

Time: 3 hrs. Max. Marks: 100

Note: ***Answer any FIVE full questions, choosing ONE full question from each module.***

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

Module-1

1 a. Classify the machine tools with an example. **(10 Marks)**

b. Define drilling machine, write a neat sketch of Bench Drilling machine. **(10 Marks)**

OR

2 a. Differentiate between Capstan and Turret lathe. **(10 Marks)**

b. Explain the constructional features of boring machine. **(10 Marks)**

Module-2

3 a. List the various machining process on lathe. **(05 Marks)**

b. Explain with neat sketch, (i) End milling (ii) Trepanning (iii) Reaming. **(15 Marks)**

OR

4 a. List the various machining process on drilling. **(05 Marks)**

b. Explain with neat sketch, (i) Taper turning (ii) Thread milling (iii) Centreless grinding. **(15 Marks)**

Module-3

5 a. Illustrate the characteristics and applications of,
(i) HSS (ii) Ceramics **(10 Marks)**

b. Find the time required for drilling a 18 mm hole in a work piece having thickness of 50 mm. Assume cutting speed of 12 meters/minute and feed 0.2 mm/revolution. Neglect the length of approach. **(10 Marks)**

OR

6 a. Explain the various types of cutting fluid with application. **(10 Marks)**

b. Evaluate the cutting parameters for slab milling operation for the following data : diameter of milling cutter 100 mm, cutter speed 500 rpm, width of cutter 100 mm, depth of cut 5 mm, table feed 100 mm/min, length of work 50 cm and width of work 80 mm and number of teeth on cutter is 8. Take tool over travel distance = 4 mm. **(10 Marks)**

Module-4

7 a. Derive an equation for relationship between shear angle (ϕ), rake angle (α) and chip thickness ratio (r). **(12 Marks)**

b. Compare up milling and down milling. **(08 Marks)**

OR

8 a. Discuss briefly the different types of chips encountered in metal cutting. **(10 Marks)**

b. Explain orthogonal cutting and oblique cutting with neat sketch. **(10 Marks)**

Module-5

9 a. Define tool wear. Explain crater wear and flank wear. **(10 Marks)**

b. Define machinability. Discuss the various criteria for determining machinability. **(10 Marks)**

OR

10 a. List and explain effect of cutting parameters on tool life. **(10 Marks)**

b. Write a note on : (i) Economics of machining process.
(ii) Elements of cost. **(10 Marks)**

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