

CBCS SCHEME

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15ME45B/15MEB405/15MA45

Fourth Semester B.E. Degree Examination, Jan./Feb. 2021 Machine Tools and Operations

Time: 3 hrs.

Max. Marks: 80

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

Module-1

- 1 a. With the help of neat sketch, explain constructional features of column and knee type milling machine. (08 Marks)
b. With a neat sketch, explain cylindrical grinding machine. (08 Marks)

OR

- 2 a. With a neat sketch, explain Pit Planer. (08 Marks)
b. Give advantages, disadvantages and applications of broaching. (08 Marks)

Module-2

- 3 a. List the factors which affect the machining process. (05 Marks)
b. Differentiate up milling and down milling process. (05 Marks)
c. List different lathe operations. (06 Marks)

OR

- 4 With a neat sketch, explain following machining processes.
a. Lathe – Knurling process
b. Drilling – Trepanning process
c. Milling – Gang milling process
d. Milling – Gear milling. (16 Marks)

Module-3

- 5 a. List the cutting tool materials in the increasing order of its hardness and explain HSS material. (08 Marks)
b. With the help of neat sketch, explain elements of single point cutting tool. (08 Marks)

OR

- 6 a. What are the properties of a good cutting fluid? (05 Marks)
b. List the types of cutting fluids and types application of cutting fluids. (05 Marks)
c. Explain the parameters affecting the surface finish during the machining process. (06 Marks)

Module-4

- 7 a. Differentiate between orthogonal cutting and oblique cutting process. (08 Marks)
b. Explain temperature development in metal cutting process. (08 Marks)

OR

- 8 a. With the help of neat sketch, explain types of chips produced during metal cutting process. (06 Marks)
- b. Write a short note on chip breakers. (04 Marks)
- c. The following data related to orthogonal cutting of a component, cutting force – 1800N, Feed force – 900N, Chip thickness ratio – 0.26, Tool rake angle – 12° . Determine shear force acting on shear plane, co-efficient of friction. (06 Marks)

Module-5

- 9 a. What is tool life and solve for the following :
Calculate the cutting speed for a tool to have a tool life of 160 min. The same tool had a life of 9 min when cutting at 250m/min. (08 Marks)
- b. Explain flank wear and crater wear. (08 Marks)

OR

- 10 a. Explain the various factors which affects the life of the cutting tool. (08 Marks)
- b. Write a note on economics of metal machining process. (08 Marks)

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