

CBCS SCHEME

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15MEB405/15MA45

Fourth Semester B.E. Degree Examination, June/July 2018 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. Define Machine tool. Give the classification of machine tools. (08 Marks)
b. Explain the constructional features of horizontal milling machine with a neat sketch. (08 Marks)

OR

- 2 a. Define drilling. With a neat sketch explain bench drilling machine. (08 Marks)
b. Define grinding. Compare cylindrical grinding and center less grinding. (08 Marks)

Module-2

- 3 a. Explain the following operations with simple sketches:
i) Turning
ii) Counter sinking
iii) Knurling
iv) Reaming. (08 Marks)
b. What are the different motions provided on:
i) Drilling machine
ii) Planer
iii) Grinding machine
iv) Shaping machine. (08 Marks)

OR

- 4 a. With a neat sketch, explain thread cutting operation on lathe. (08 Marks)
b. List and explain different machining parameters and related quantities on a lathe. (08 Marks)

Module-3

- 5 a. Briefly explain the desirable properties of cutting fluids. (08 Marks)
b. Calculate machining time for a work piece of 90mm diameter and 130mm length turned in 2 passes. If the approach length is 12mm and over travel is 5mm. Given cutting speed = 30m/min and feed 0.3 mm/rev. (08 Marks)

OR

- 6 a. Briefly explain desirable properties or characteristics of an ideal cutting tool material. List various cutting tool materials. (08 Marks)
b. A shaping machine is used to machine a rectangular piece of 18cm long and 35cm width, with cutting speed being 26 m/min. Feed is 0.8 mm/cycle. Time for cutting to return stroke is 3:2. Find the time required to machine the whole surface. (08 Marks)

Module-4

- 7 a. Explain the different types of chips produced during metal cutting with neat sketches. (08 Marks)
- b. With neat sketches explain the difference between orthogonal cutting and oblique cutting. (08 Marks)

OR

- 8 a. What are the components of cutting force in turning a cylindrical job? (08 Marks)
- b. It is required to drill a 20mm diameter hole in a mild steel plate at a feed rate of 0.25 mm/rev and at a drill speed of 300rpm. Estimate the power required. Take machining constant $C = 0.36$ for mild steel material. (08 Marks)

Module-5

- 9 a. List the factors affecting tool life and briefly explain them. (08 Marks)
- b. A tool life of 80 minutes is obtained at a speed of 30mpm and 8 minutes at 60mpm. Determine the following:
- i) Tool life equation
- ii) Cutting speed for 4 minute tool life. (08 Marks)

OR

- 10 a. Define tool wear. Explain crater wear and flank wear. (08 Marks)
- b. What is machinability? List out the machinability criteria and explain them briefly. (08 Marks)

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