CBCS SCHEME

USN ☐☐☐☐☐☐☐☐☐☐ 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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