

# CBCS Scheme

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15ME35B

## Third Semester B.E. Degree Examination, June/July 2017 Machine Tools and Operations

Time: 3 hrs.

Max. Marks: 80

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

### Module-1

- 1 a. Explain with a neat sketch, the main parts of a lathe machine. (08 Marks)  
b. Sketch and explain radial drilling machine and list the classification of drilling machine. (08 Marks)

OR

- 2 a. Draw a neat sketch to show major parts of a horizontal milling machine. (08 Marks)  
b. Sketch a planing machine indicating major parts. Name any one of the mechanism for quick return movement in a planer. (08 Marks)

### Module-2

- 3 a. What are the different motion provided on a lathe? (06 Marks)  
b. List and explain different machining parameters and related quantities on a lathe. (05 Marks)  
c. What are the tools used on lathes? (05 Marks)

OR

- 4 a. Explain the process of up-milling and down milling. What are advantages of each process? (06 Marks)  
b. List and explain different machining parameters and related quantities on a broaching machine. (05 Marks)  
c. Draw a neat sketch and explain centerless grinding machine. (05 Marks)

### Module-3

- 5 a. Explain the geometry of a single point cutting tool with a neat sketch. (06 Marks)  
b. List and explain the essential properties of cutting tool materials. (05 Marks)  
c. Explain the effect of machining parameters on surface finish. (05 Marks)

OR

- 6 a. A workpiece of diameter 38 mm and length 400 mm was turned on a lathe using suitable cutting tool. Determine the machining time to reduce the workpiece to 36.5 mm diameter in one pass with cutting speed of 30 mpm and feed 0.7 mm/rev. (08 Marks)  
b. A shaping machine is used to machine a rectangular piece of 18 cm long and 35 cm width which cutting speed being 26 m/min. Feed is 0.8 mm/cycle cutting stroke is adjusted to 20 cm. Time for cutting to return stroke is 3 : 2. Find the time required for machining the whole surface. (08 Marks)

### Module-4

- 7 a. Briefly explain the different types of chips produced during metal cutting with neat sketches. (06 Marks)  
b. Draw merchants circle diagram using usual notations and state the assumptions. (05 Marks)  
c. The following data refer to an orthogonal cutting process. Chip thickness 0.62 mm, feed 0.2 mm, rake angle 15°. Calculate chip reduction co-efficient and shear angle. (05 Marks)

OR

- 8 a. What are the components of cutting force in turning a cylindrical job? (06 Marks)  
b. Derive an expression for power needed in a turning operation. (05 Marks)  
c. List the drilling factors affect the drilling torque and thrust force. (05 Marks)

Module-5

- 9 a. Define tool life. List out the wear mechanisms. Explain any one. (06 Marks)  
b. A tool life of 80 minute is obtained at a speed of 30 mpm and 8 minute at 60 mpm. Determine the tool life equation and cutting speed for 4 minute tool life. (05 Marks)  
c. What is machinability? List out the machinability criteria. (05 Marks)

OR

- 10 a. What do you understand by economics of machining? How do you evaluate machining cost? (08 Marks)  
b. Explain how do you evaluate the actual time of machining. (08 Marks)

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