CBCS Scheme

USN | | | | | | | | | |

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 planning 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)**

* * * * *