

Total No. of Questions : 10 ] [ Total No. of Printed Pages : 3

Roll No. ....

### IP/ME-603

B. E. (Sixth Semester) EXAMINATION, June, 2012

(Common for IP & ME Engg. Branch)

METAL CUTTING AND CNC MACHINES

*Time : Three Hours*

*Maximum Marks : 100*

*Minimum Pass Marks : 35*

**Note :** Attempt *one* question from each Unit. All questions carry equal marks.

#### Unit – I

1. (a) What are the influences of cutting tool angles on machining ? Briefly state the effect of rake angle during cutting. 10
- (b) Describe with the help of suitable sketches, the various types of tools used in a lathe. 10

*Or*

2. (a) Compare the merits and demerits of turret and capstan lathes with an engine lathe. 10
- (b) Calculate the amount of tailstock set over to turn a taper of 1 in 20 over full length of a job 300 cm long. 10

P. T. O.

## Unit-II

3. (a) Draw a neat sketch of chuck type internal cylindrical grinder and explain its operation. 10  
(b) Differentiate between grains grade and structure of a grinding wheel. 10

Or

4. (a) What is centreless grinding ? State the advantages of centreless grinding. 10  
(b) Calculate the power required per  $\text{mm}^3$  of metal removed per second for a surface grinding operation using the following data : Tangential force = 84 N, Wheel speed = 20 m/s; Work speed = 0.18 m/s  
Depth of cut = 0.018 mm; Width of cut = 14 mm. 10

## Unit-III

5. (a) Sketch a twist drill and describe its various elements. 10  
(b) Determine the machining time to drill a hole of 20 mm diameter in a workpiece 25 mm thick by a drill at a cutting speed of 30 meter/min with a feed of 0.2 mm/rev. 10

Or

6. (a) Sketch and explain Up milling and Down milling. 10  
(b) A broach is used to cut a key way 8 mm wide, 5 mm deep in a box 64 mm long. Determine : 10  
(i) Cutting length of broach  
(ii) Number of teeth on broach

## Unit-IV

7. (a) Draw the block diagram of horizontal shaper and write about its important parts. 10  
(b) Sketch and explain the mechanical feed drive of a horizontal shaper. 10

[ 3 ]

Or

8. (a) Discuss the methods of measuring surface roughness. 10  
(b) Briefly explain the method of die casting for manufacturing gears. 10

Unit - V

9. (a) Explain the control process. Illustrate analog control. 10  
(b) What do you understand by Transfer function ? Explain. 10

Or

10. (a) What is PLC ? Explain with neat sketch. 10  
(b) Give the classification of CNC machines. What are the various types of tools used in CNC machines ? 10