

Code: ME5T2

**III B.Tech - I Semester – Regular Examinations – December 2016**

**METAL CUTTING AND MACHINE TOOLS  
(MECHANICAL ENGINEERING)**

Duration: 3 hours

Max. Marks: 70

**PART – A**

Answer *all* the questions. All questions carry equal marks

11x 2 = 22 M

1.

- a) How is chip formed during machining process?
- b) Define orthogonal cutting process. Mention the assumptions made for orthogonal cutting process.
- c) Differentiate between the 3- jaw and 4 – jaw chuck with sketches.
- d) Give the specifications of a capstan lathe.
- e) Write the working principle of slotter.
- f) What are the various work holding devices used on shaper?
- g) List out the tool holding devices used on drilling machine.
- h) Classify the types of surface grinding machines.
- i) Differentiate between up milling and down milling.
- j) Explain straddle milling with a sketch.
- k) What is the use of boring bar on boring machine?

## PART – B

Answer any **THREE** questions. All questions carry equal marks. 3 x 16 = 48 M

2. a) Define shear angle and Derive expression for shear angle in terms of rake angle and cutting ratio. 8 M  
  
b) Discuss the various types of tool wear and tool wear mechanisms. 8 M
  
3. a) List out the various taper turning methods. Explain tail stock set over method of taper turning on a lathe. 8 M  
  
b) What do you understand about an automatic lathe? Differentiate between single spindle and multi spindle automatic lathes. 8 M
  
4. a) Explain the various operations performed on shaper with neat sketches. 8 M  
  
b) Explain the principal parts of a slotter with neat line diagram. 8 M
  
5. a) List out the types of jig boring machines. What are the extra facilities in a jig boring machine over an ordinary boring machine? 8 M

- b) Draw the neat sketch of a push broach. Explain different elements of it. 8 M
6. a) Classify the milling machines. Differentiate between plain milling machine and universal milling machine. 8 M
- b) Explain the various element of plain milling cutter with neat sketch. 8 M