



**B.E. / B.Tech (Full time) DEGREE END SEMESTER EXAMINATIONS APRIL / MAY 2011**

**MECHANICAL ENGINEERING BRANCH**

**FOURTH SEMESTER (R-2008)**

**ME 9251 – MANUFACTURING TECHNOLOGY – II**

**Time : 3 hr**

**Max. Mark: 100**

**Answer all Questions**  
**Part – A (10x2=20 Marks)**

1. Why does the cutting force increases with increasing depth of cut in metal cutting?
2. What are the unusual properties of carbide as a cutting tool material?
3. Why are spindle of a lathe made hollow?
4. How are automatic lathe classified?
5. What is the purpose of clapper box in a shaper?
6. State any four relative merits of gear production by the principle of gear generation over-forming.
7. What are the unique features of broaching?
8. How does plunge grinding differ in principle from traverse grinding?
9. What is meant by interpolation in N.C. programme?
10. State any two capabilities of machining centre.

**PART – B (5x16=80 Marks)**

- 11: (i) Describe the relative characteristic features of up milling and down milling with a sketch. (6)
- (ii) A key way of 10mm wide and 4mm deep is machined on 120mm long shaft using end mill of 10mm diameter cutter in single pass. The approach and over travel distance is twice the diameter of the cutter. The cutter has four cutting edges. Assume the cutting speed and feed / tooth as 40m/min and 0.2mm respectively.
- (i) Determine the machining time. (5)
- (ii) Sketch the job setup and explain the steps in machining the key way. (5)
- 12.(a) (i) Explain the essential difference between orthogonal cutting and oblique cutting. (6)
- (ii) Sketch a single point turning tool indicating the various angles and explain the functions of each angle. (10)

**(OR)**

- (b)(i) Discuss the purpose of using cutting fluid in grinding. (6)

- (ii) A HSS single point turning tool with a rake angle of  $10^\circ$  was used in orthogonal machining experiment. The following observations are made:

Horizontal component of cutting force = 1100N

Vertical component of cutting force = 1600N

Chip thickness ratio = 0.3

(2)

Determine:

(4)

1. Shear plane angle (4)
2. Resultant force and friction angle
3. Represent the forces in merchants circle diagram.

- 13.(a) (i) Describe any two special attachment used in a centre lathe. (6)
- (ii) Describe with a neat sketch the use of (1) follower rest (2) steady rest. (10)

(OR)

- (b) (i) How are horizontal turret – lathe differ constructionally with an engine lathe. (6)
- (ii) Describe with a neat sketch the principle of working of swiss type auto lathe. (10)

- 14.(a)(i) Sketch a push broach and explain why push broaches are shorter than pull broach. (6)
- (ii) Describe with a sketch continuous broaching machine stating its advantages and specific applications. (10)

(OR)

- (b)(i) Explain significance of marking **A – 50 – Q – 8 – V – 30** on the grinding wheel. (6)
- (ii) Explain with a sketch an external centreless grinding indicating its specific merits and applications. (10)

- 15.(a)(i) Describe technological advantages and limitations of N.C. machines. (6)
- (ii) Explain the salient characteristic features of CNC machine that distinguish from N.C. machines. (10)

(OR)

- (b) (i) How are G and M codes useful in N.C. part program (6)
- (ii) The component shown below is made from EN 1040 steel plate of 5mm thick. Write part programming using G and M codes for vertical machining centre equipped with ISO controller. Assume suitable spindle speed and feed rate. (10)

