

Reg. No. :

Question Paper Code : 11408

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2011

Fourth Semester

Mechanical Engineering

ME 2252 — MANUFACTURING TECHNOLOGY — II

(Regulation 2008)

(Common to PTME 2252 Manufacturing Technology – II for B.E. (Part-Time)
Third Semester – Regulation 2009)

Time : Three hours

Maximum : 100 marks

Answer ALL questions

PART A — (10 × 2 = 20 marks)

1. Compare orthogonal and oblique cutting.
2. Define tool life.
3. List any four methods by which taper turning is done in a centre lathe.
4. Draw a neat sketch of 'Geneva mechanism' used in turret lathes for automatic indexing.
5. What is the difference between up milling and down milling?
6. List any four applications of broaching machines.
7. What is meant by "grade" and "structure" of a grinding wheel?
8. What are all the parameters that would affect the MRR in abrasive jet machining?
9. Compare a closed loop NC system with open loop NC system.
10. What is a preparatory function? How is it important in CNC Programming?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Describe the mechanism of metal cutting. (8)
- (ii) Discuss the various types of chips produced during metal machining. (8)

Or

- (b) (i) The Taylor tool-life equation for machining C-40 steel with a HSS cutting tool at a feed of 0.2 mm/min and a depth of cut of 2 mm is given by $VT^n = C$, where n and C are constants. The following V and T observations have been noted :

V , m/min	25	35
T , min	90	20

Calculate

- (1) n and C ,
- (2) Hence recommend the cutting speed for a desired tool life of 60 min. (8)
- (ii) List the various tool materials used in industry. State the optimum temperature of each of the tool materials (8)
12. (a) (i) Calculate the change gears to cut a single start thread M16 of 2 mm pitch on a centre lathe, having a lead screw of 6 mm pitch. Calculate the depth of cut and number of passes preferred. (A typical set contains the following change gears with number of teeth : 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, and 70) (8)
- (ii) Draw neat sketches of steady and follower rests and brief their applications. (8)

Or

- (b) (i) Explain the bar feeding mechanism used in turret lathe while machining bar stock. (8)
- (ii) Describe the constructional features of Swiss type automatic screw machine. (8)

13. (a) (i) Sketch and explain the hydraulic drive of a horizontal shaper. (8)
(ii) How will you cut the following types of surfaces on milling machines?
(1) Flat surfaces
(2) Slots and Splines. (8)

Or

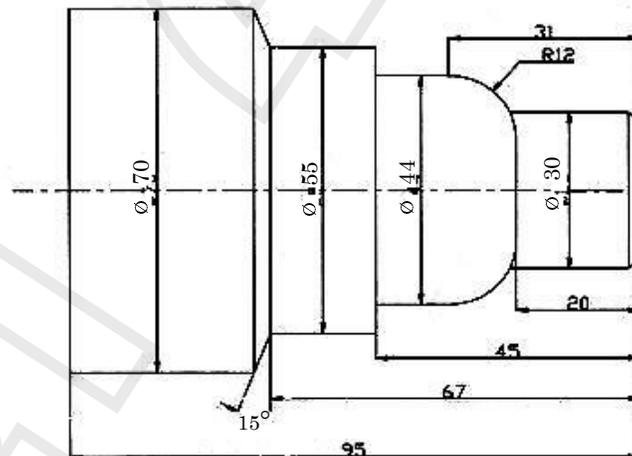
- (b) (i) Sketch the Quill mechanism. Write its main parts and their functions. (8)
(ii) With the help of a neat sketch, discuss the working of a surface broaching machine. (8)
14. (a) (i) Discuss the various bonding materials used for making grinding wheels. (8)
(ii) Sketch and explain the three methods of external cylindrical centreless grinding. (8)

Or

- (b) (i) List the advantages and disadvantages of gear shaping process. (8)
(ii) Explain how a spur gear is machined in a gear hobbing machine. (8)
15. (a) (i) List down the main components of an NC machine tool and explain their functions. (8)
(ii) With a neat sketch, explain any one type of axis feed drive of a CNC machine and list its advantages. (8)

Or

- (b) (i) With a neat sketch, explain the working of ATC. (6)
(ii) A 110 mm long cylindrical rod of $\Phi 75$ mm is to be turned into a component as shown in Fig-1, using a CNC lathe. Write a CNC program for manufacturing this component. (10)



(All dimensions are in mm)

Fig. 1