

ME 304 - Machining Processes

P. Pages : 2

Time : Three Hours

**GUG/W/16/3793**

Max. Marks : 80

- Notes :
1. All questions carry equal marks.
 2. Answer Q. 1 or Q. 2, Q. 3 or Q. 4, Q. 5 or Q. 6, Q. 7 or Q. 8, Q. 9 or Q. 10.
 3. Due credit will be given to neatness and adequate dimensions.
 4. Assume suitable data wherever necessary.
 5. Illustrate your answers wherever necessary with the help of neat sketches.

1. a) Explain with schematic diagram, the principle of thread cutting on a lathe. Find out the relation between ratio of change gears to the work pitch and lead screw pitch. 8
 The pitch of a lead screw is 6 mm and the pitch of the thread to be cut is 1.5 mm. Find the change gear.

- b) A lathe has four steps, the diameter of each being 90 mm, 130 mm, 170 mm and 210mm. 8
 The counter shaft pulley revolves at 100 rpm. The gears A, B, C and D have 16, 48, 16, 48 teeth respectively. Find the various speeds of the spindle.

OR

2. a) Explain the working of a split or Half nut. Why it is used? 5
 b) What is 'Eccentric Turning'? How is it performed on lathe? 4
 c) What is a lathe carriage? Explain its various parts with the help of a sketch. 7
3. a) Describe whitworth quick return mechanism, used in shaper with neat sketch. 6
 b) How we can adjust the length of stroke in a shaper? Explain. 4
 c) Find the time required for taking a complete cut on a plate 600 x 900 mm, if the cutting speed is 9 m/min. The Return time to cutting time ratio is 1:4 and the feed is 3 mm. The clearance at each end is 75 mm. 6

OR

4. a) What are the differences between a planer and a shaper? 4
 b) Explain open and cross belt drive quick return mechanism of a planer. 8
 c) Write short note on "Various ram drive mechanisms of a slotter". 4
5. a) Sketch and describe the following milling operations 8
 i) Slot milling
 ii) Keyway milling
 iii) Slitting or saw milling
 iv) Side milling
- b) Describe elements of plain milling cutter with neat sketch. 8

OR

6. a) What is centreless grinding? Describe centreless grinding operations. Also describe the advantages of centreless grinding? **8**
- b) What is Honing? Describe the process of honing with neat sketch. Also explain why surface finishing is an important manufacturing process. **8**
7. a) How the size of a drilling machine is specified? Sketch and describe in detail 'radial drilling machine'. **8**
- b) Write short notes on **8**
- i) Vertical turret Lathe
- ii) Jig boring machine

OR

8. a) Describe "Pull" and "Push" broaching with the help of neat sketches. **6**
- b) What are different types of Reamers you Know? What are chucking or machine Reamers? Explain it with neat sketch. **6**
- c) Discuss machining time estimation in drilling. **4**
9. a) Why heat is generated in cutting. Label various heat sources and zones in metal cutting? Draw a sketch to show heat distribution to various elements during metal cutting. **4**
- b) What are the desirable characteristics of cutting tool materials? Describe them in brief. **6**
- c) What are the factors that affect tool life? briefly describe their influence. **6**

OR

10. a) What is cutting fluid? What are the functions of a cutting fluid? **5**
- b) Describe the tool geometry of a single point cutting tool with neat sketch. **7**
- c) What do you mean by "tool signature" explain in brief? A single point cutting tool has specifications in order: 10° , 12° , 7° , 5° , 6° , 15° , 3 mm Indicate the different parameters. **4**
