

2007-ANNA UNIVERSITY
B.E/B.TECH V SEMESTER DEGREE EXAMINATION
ME 334 - MACHINE TOOLS
(MECHANICAL ENGINEERING)

MAY-2007

TIME-3 HOUR
MARKS-100

ANSWER ALL QUESTIONS.

PART A - (10 * 2 = 20 MARKS)

1. Calculate the lathe spindle speed in RPM to turn a 20 mm diameter bar stock at a cutting speed of 30 M/min.
2. An engine lathe has a square threaded single start lead screw of 3 mm pitch. Determine the speed ratio between the main spindle and lead screw to machine a TWO Start 6 mm pitch screw in this machine.
3. What is the objective of incorporating the clapper box mechanism in the tool head of a shaping machine.
- 4 List the factors included in a grinding wheel specification.
5. One of the index plate of Brown and Sharp milling machine has the following hole circles : 15, 16, 17, 18, 19, 20. How much the index crank of the dividing head has to be rotated to mill each tooth of a spur gear of 24 teeth using suitable hole circle?
6. A helical gear of helix angle B (Right hand) is to be machined in a gear hobbing machine using a hob cutter of helix angle of A (also of Right hand). What is the angle through which the hob cutter has to be tilted during machining?.
7. What is the function of combination tool holder in a turret lathe?
8. Point out one salient difference between single spindle automat and multispindle automat in their working.
9. During orthogonal machining with a cutting tool having a 10 deg. Positive rake angle, the chip thickness is measured to be 0.4 mm for a depth of cut of 0.2 mm. Determine the shear plane angle.
10. List the four important functions of cutting fluid in the metal machining.

PART B - (5 * 16 = 80 MARKS)

- 11.a) Draw the sketch of twist drill, name the important parts and explain their functions
- b) How does a reamer differ from a drill bit?
- 12.a) What are the different taper turning methods used in a lathe? Explain with sketch any one of them in detail.
OR
- 12.b) A M20 nut has to be machined from a suitable hexagonal bar stock. Draw the tool layout if this is mass produced in a turret lathe.
- 13.a) Draw sketch of a crank shaper, mark the important parts and explain their functions. Explain how quick return mechanism works.
OR
- 13.b)i) Explain the principle of working of centreless grinding machine.
- ii) What are 'Through Feed', 'In Feed', and 'End Feed' in centreless grinding operations?
- 14.a) Explain the following milling operations with sketches:
 - (i) Straddle Milling,
 - (ii) Gang Milling
 - (iii) Form Milling

(iv) End Milling

(v) Up Milling.

OR

14.b) Draw the Kinematic diagram of a gear shaping machine and explain how gears are machined.

15.a) The following data are available in orthogonal cutting using single point tool:

i. Rake angle of the tool = + 10 deg.

ii. Depth of cut : = 2.0 mm

iii. Chip thickness ratio : = 0.31

iv. Vertical cutting force: = 1200 N.

v. Horizontal cutting force: = 650 N.

Draw the Merchant's Circle diagram and determine Normal and Shear Force along the shear plane.

OR

15.b)i) What are the advantages of automats as compared to engine lathes?

ii) List the different types of automats and briefly explain the working of any one.

Educationobserver.com