

1. State the differences between orthogonal and oblique cutting.
2. What are the main requirements of cutting tool materials?
3. Give the specification of a lathe.
4. How are automatic lathes classified?
5. What is a Reamer?
6. What is straddle milling?
7. How does wheel dressing differ from wheel truing?
8. What are natural and artificial abrasives?
9. List the advantages of CNC machines.
10. State any four motion statements used in APT.

11. (a) (i) Describe the Merchant's model for orthogonal cutting. (12 + 4)
(ii) The useful tool life of a HSS tool machining mild steel 20 m/min is 3 hours. Calculate the tool life when tool operates at 26 m/min. (Take $n = 0.125$).

Or

- (b) (i) Discuss the different types of tool wear mechanisms.
(ii) In an orthogonal cutting process, the following observations were made uncut chip thickness = 0.25 mm; cutting force = 1100 N; feed force = 120 N; chip thickness ratio = 0.46; rake angle = 22° ; width of cut = 4.5 mm and Cutting velocity = 35 m/min. Determine the friction angle, shear plane angle, resultant cutting force and power consumption. (8 + 8)
12. (a) (i) Discuss the various types of chucks used in lathe. (8 + 8)
(ii) Illustrate the function of Turret indexing mechanism.

Or

- (b) (i) Describe the bar feeding mechanism of capstan lathe.
(ii) Sketch and explain the salient features of an automatic screw machine. (8 + 8)
13. (a) (i) Compare up milling and down milling.
(ii) What is a Tap? How are taps classified?
(iii) Discuss the operations that can be effectively performed by Planer and also indicate the tools for the operations. (4 + 4 + 8)

Or

- (b) (i) Illustrate the hydraulic quick return mechanism in shaper and also explain its functioning.
(ii) How mass production of small parts is done in broaching? Explain with sketches. (8 + 8)
14. (a) (i) How do you select a grinding wheel for a given application?
(ii) Explain the honing process with suitable sketches. (8 + 8)

Or

- (b) (i) Give the block diagram of a Tool and Cutter grinder and also indicate its principal parts.
(ii) Describe the gear hobbing process with neat sketch. (8 + 8)

- (ii) Explain the different types of slide ways used in CNC machine tools. (8 + 8)

Or

- (b) (i) With the aid of block diagram explain the steps involved in computer assisted part programming.
- (ii) Write a part program for the part shown in Figure Q.15(b) (ii). (8 + 8)

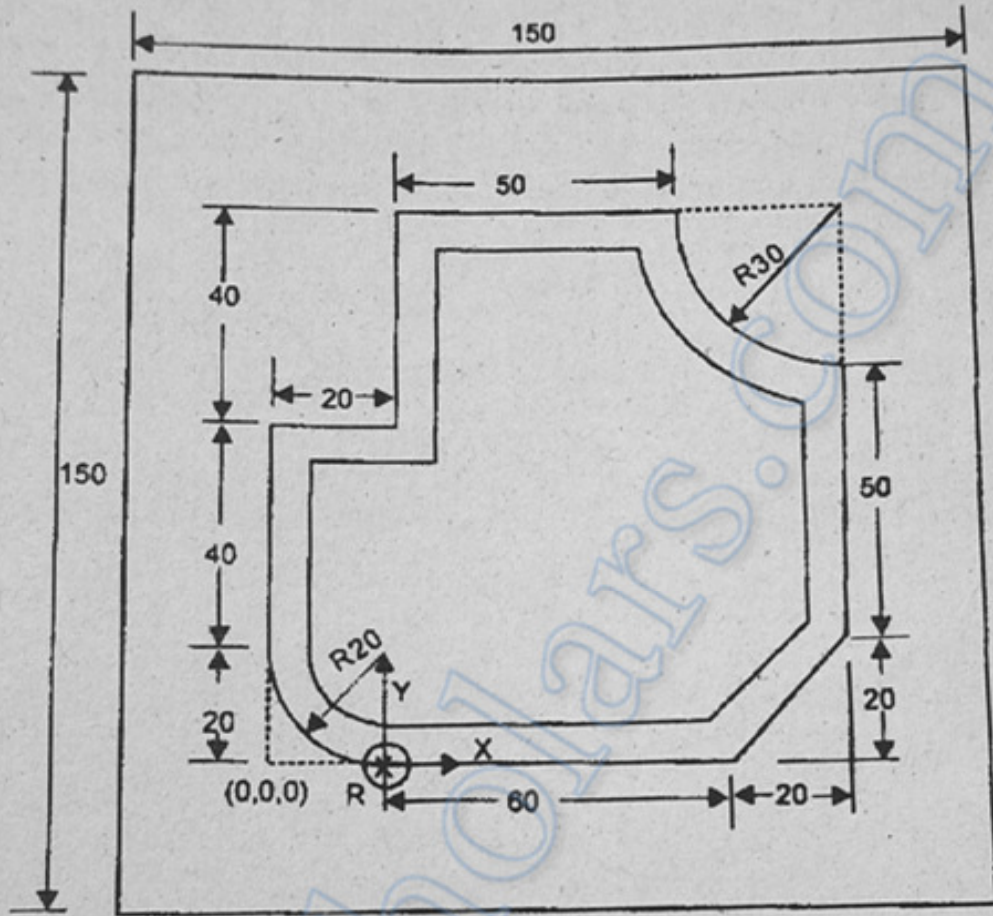


Figure Q.15(b) (ii)