

Note:

1. Question 1 is Compulsory
2. Solve any three from remaining five
3. Figures to right indicate full marks
4. Assume suitable data if necessary

Q.1

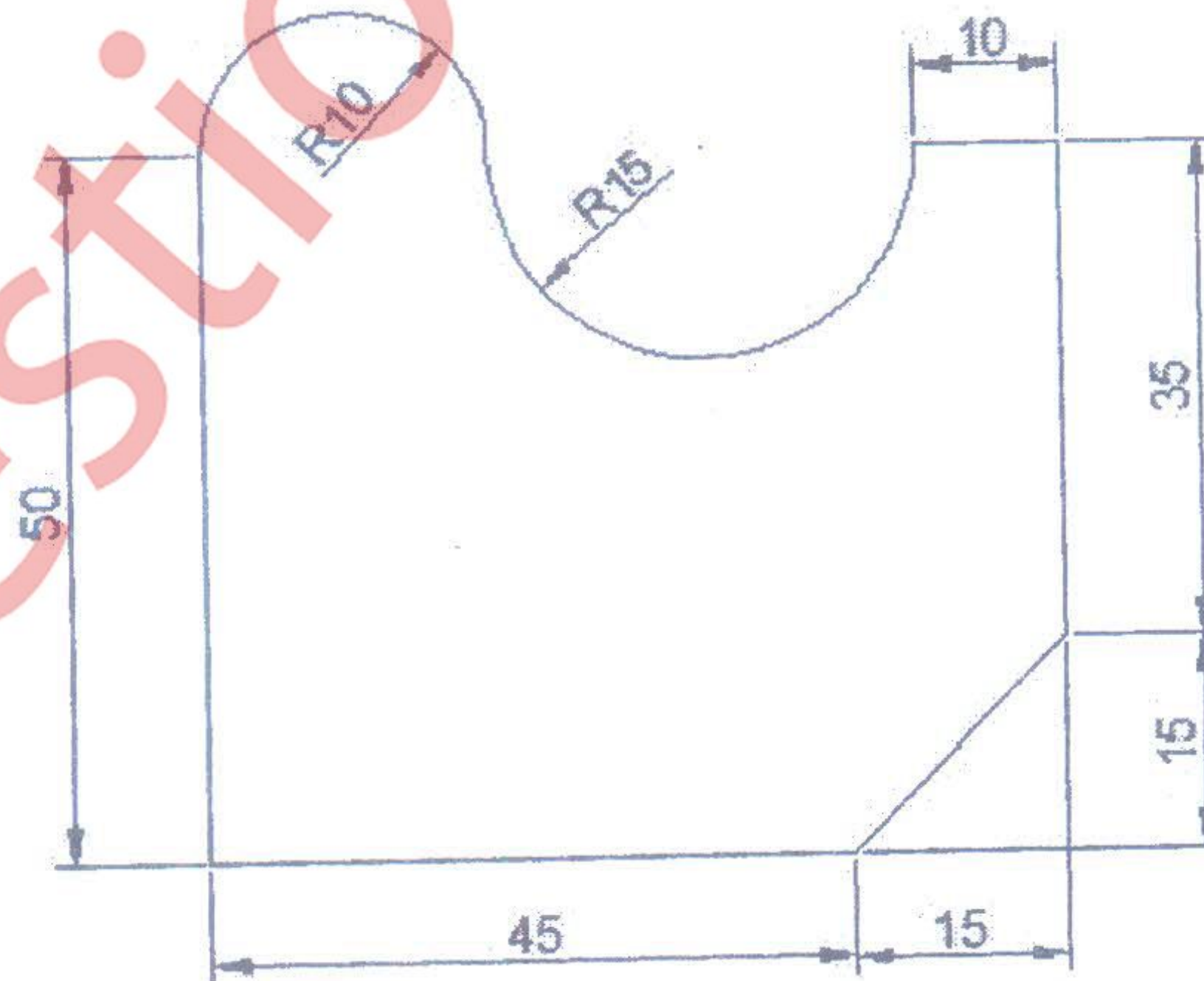
- a) Compare Beizer and B-Spline curve 5
- b) Describe an algorithm for the removal of hidden lines. 5
- c) Describe the axis representation system used for CNC Milling machines. Discuss the various interpolation methods used in NC machines. 5
- d) Explain the Socio-techno-economic aspects of CIM 5

Q.2

- a) Find the midpoint of the Bezier curve having end points  $P_0(0,0)$  and  $P_3(7,0)$ . The other control points are  $P_1(7,0)$  and  $P_2(7,6)$ . 10
- b) Explain industrial Robots and its application in manufacturing. 10

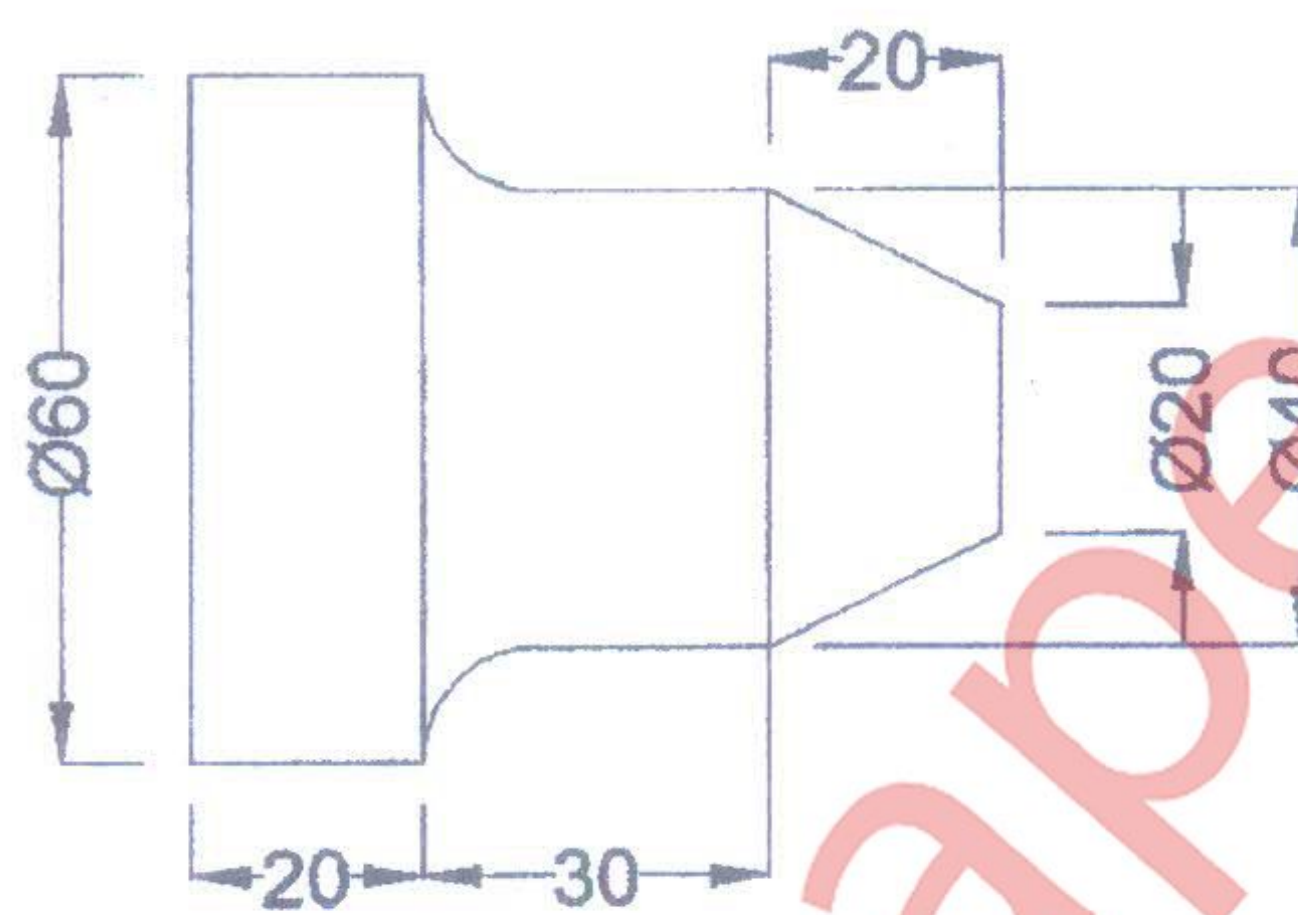
Q.3

- a) Write a manual part program to machine the contour as shown in figure. The component is 12mm thick. 10



- b) Explain laminated object manufacturing with its advantages and disadvantages. 10

- Q.4 a) Show that the transformation matrix for a reflection about the line  $y = x$  is equivalent to a reflection relative to the x-axis, followed by an anticlockwise rotation of  $90^\circ$ . 8
- b) Explain the APT statements: i) GOTO and GO/TO ii) G0DLTA and GOBACK and iii) INTOL and OUTTOL. 6
- c) Explain any one velocity feedback device. 6
- Q.5 a) Write a part program for the component shown in the figure assuming the raw billet size of dia. 60 mm and length 80 mm using canned cycle for rough turning followed by finished turning, keeping the finishing allowance as 0.5 mm and 0.3 mm along Z and X axis respectively. 10



- b) Plot a hermite cubic curve having endpoints  $P_0(1,1)$  and  $P_1(7,4)$ . The tangent vector for end  $P_0$  is defined by a line joining  $P_0$  and another point  $P_2(8,7)$ , whereas the tangent vector for end  $P_1$  is defined by a line joining  $P_1$  and the same point  $P_2(8,7)$ . 10

- Q.6 Write short note on any Four: 20
- Macros and Subroutines
  - Data structures for interactive modeling
  - Steps involved in CAE
  - Photolithography
  - Database requirements in CIM