E | VII | Mech | Rev | CAD | CAM | CIM | 02 Dec. 11

Con. 6133-11.

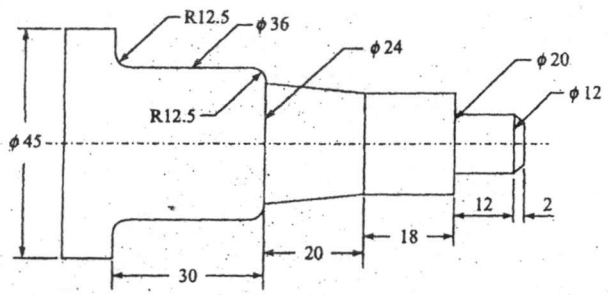
MP-5509

(REVISED COURSE)

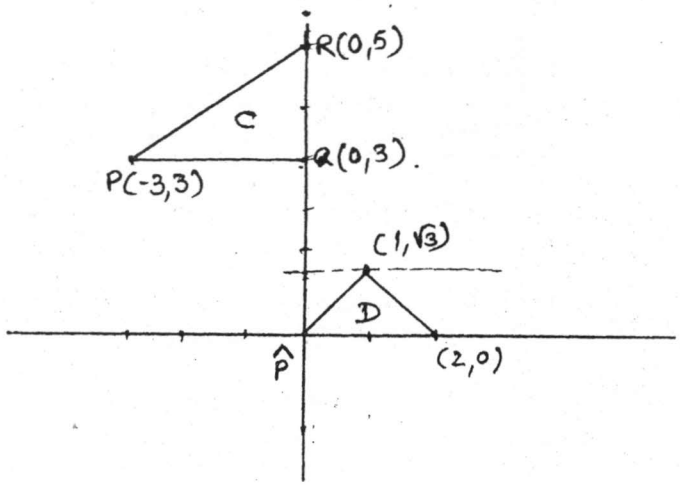
(4 Hours) [Total Marks : 100

N.B. : (1) Attempt any **five** questions including Question No. **1**, which is **compulsory**.
(2) Assume **suitable** data, wherever **necessary** in case of mispoint also.
(3) Use legible handwriting.

1. (a) Write a complete part program using G and M codes for the job given below. Assume suitable speed and feed for machining. Billet size is X45 Z85. 7



(b) Find the affine transformation that converts trangle 'C' with vertices (– 3, 3), (0, 3), (0, 5) into an equilateral trangle 'D' with vertices (0, 0), (2, 0) and $\left(1, \sqrt{3}\right)$. 7



(c) Explain the steps involved in CAD and CAM process ? 6

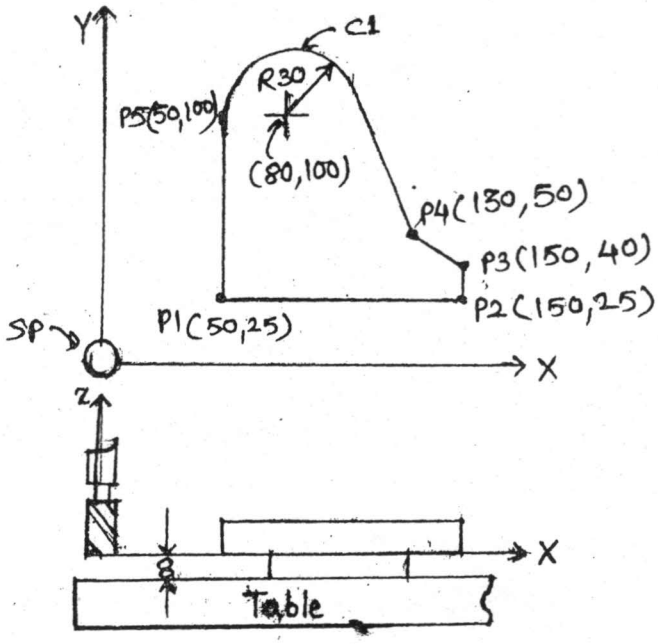
2. (a) Write a program in C++ by ooprogramming method for 2D geometric transformations which include functions for :— 10
(i) Translation (ii) Rotation (iii) Scaling.

(b) Explain the CIM wheel with neat sketch along with features and functioning of CIM system. 10

3. Explain—(any **four**) :— 20
(a) Re-Engineering Vs. Reverse Engineering.
(b) Macro statement in APT.
(c) Rapid prototyping.
(d) PFA (Product Flow Analysis)
(e) Industrial Robots and its applications in manufacturing.
(f) DFMA (Design for manufacturing and Assembly.

[TURN OVER

4. (a) Write the APT program for machining the part as shown below **figure**. 10
The part is to be made on a milling machine.
Given Data : Part name – BRACKET
Post processor – ABM, 8
Cutter used – 10 mm HSS end mill
Work piece – Mild steel
Feed rate – 0·1 mm/rev.
Spindle speed – 1000 rpm.



(b) Explain in detail :— 10
(i) Group Technology Concept.
(ii) Product life cycle with CAD/CAM overlay.

5. (a) Find the equation of Bezier curve which is defined by four points as :— 10
$P_0 \equiv (2, 2, 0)$
$P_1 \equiv (2, 3, 0)$
$P_2 \equiv (3, 3, 0)$
$P_3 \equiv (3, 2, 0)$
and also find the points on the curve for u = 0, 0·25, 0·5 and 1.

(b) Explain the adaptive control system by explaining ACC and ACO. 10

6. (a) Explain the concept of Conc. Engg. and its comparision with sequential Engg. 5

(b) Explain (any **three** Algorithms.) :— 15
(i) Cohen Sutherland Algorithm.
(ii) Sutherland Hodgemen Algorithm.
(iii) Painter Algorithm.
(iv) Area subdivision Algorithm.

7. Explain (any **four**) :— 20
(a) CAD/CAM tools.
(b) Graphics stds.
(c) NC tooling.
(d) Computer Aided Quality Control.
(e) Green Manufacturing.
(f) AI.

———S———