1128
B. E. (Mechanical Engineering)
Fifth Semester
MEC-502: Computer Aided Design and Manufacturing (CAD/CAM)

Max. Marks: 50

Time allowed: 3 Hours

NOTE: *Attempt* _five_ *questions in all, including Question No. 1 which is compulsory and selecting two questions from each Unit.*

x-x-x

I. Attempt the following:-

a) Differentiate between Geometry and topology with suitable example.

b) Why homogeneous transformations are required. Write 2d rotation homogeneous matrix.

c) What is the significance of adaptive control?

d) Write the parametric equation of any two natural curves.

e) Describe the codes for coolants on or off? (5x2)

UNIT – I

II. a) A square with co-ordinates (1,1), (6,1) (6,6) and (1,6) is rotated by 50° in clockwise direction keeping point (6,1) fixed and then uniformly scaled by factor of 2 about the point (6,1). Find the final coordinates, displaying the final position of the square.

b) Obtain the shearing effect on a square A (0,0), B(0,3), C(3,3) and D(3,0) where (7,3)
shx=shy=2units.

III. a) How the traditional designing process is different from computer aided design. Explain by taking a suitable example.

(5,5)

b) Differentiate Bezier and B-spline curves.

IV. a) A cubic curve is defined by control points as (20, 20), (60,80), (120, 100) and (150,30). Find the equation of the curve and its mid point.

(7,3)

b) Describe the characteristics of fixed automation.

P.T.O.

UNIT – II

V.   a) Develop CSG Data table and CSG tree for the components shown in diagram
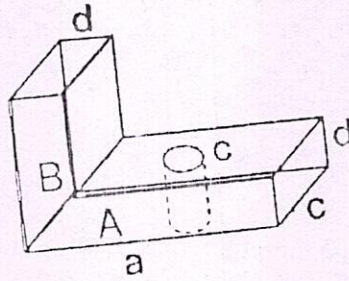
b) What is Bi-Cubic surface? Explain by describing its parametric equation. (7,3)

VI. a) Discuss in detail about main constructional features of CNC machines.   (7,3)

b) Write a short note on canned cycles.

VII. a) Write a manual part program for finishing a forged component as shown. Assume the spindle speed and feed for machining as 500 rpm and 0.3 mm/rev respectively.
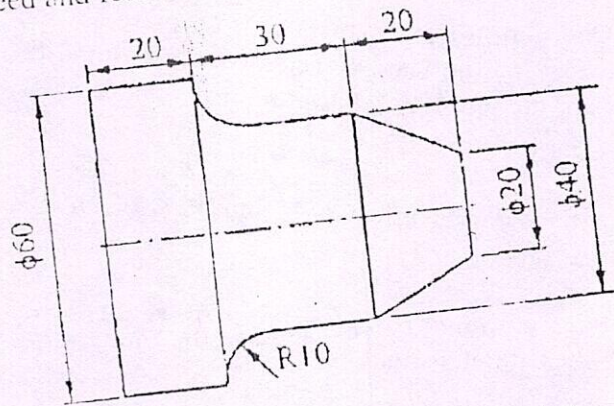
All dimensions in mm. Take suitable assumptions if needed.

b) Explain the use of DO loops in NC part programming with suitable example.(7,3)

x-x-x