College of Engineering, Pune – 5.

(An Autonomous Institute of Government of Maharashtra)

END-SEMESTER EXAM (CAD-CAM-CIM) (PE 403)

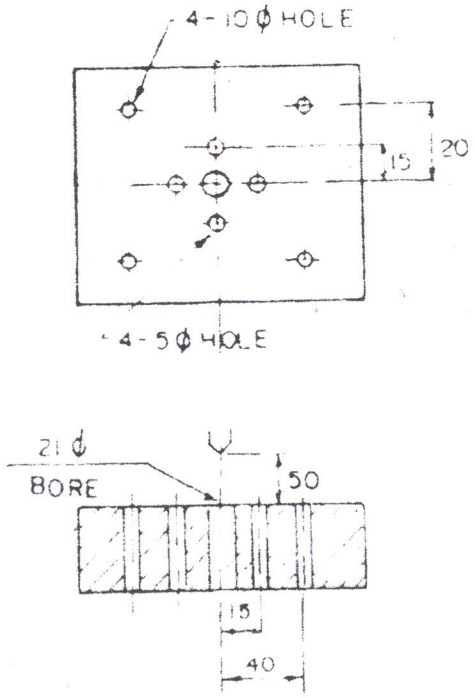
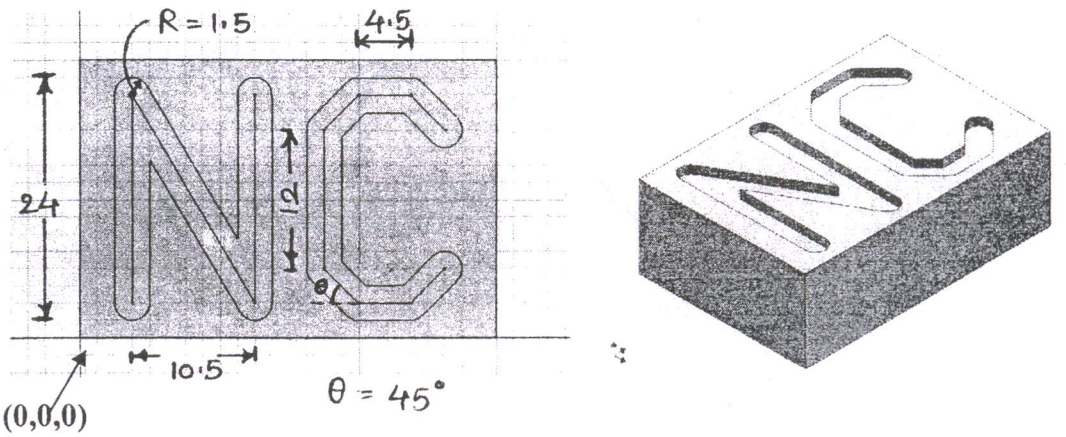
Programme: B.Tech. (Production) Year: 2013 –14; Semester: I

Duration: 3 Hrs. Max. Marks: 60

Instructions:

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Draw neat sketches wherever required.
4. Use of pocket calculators is allowed.
5. Assume suitable data if necessary.

Q. 1	A.	Calculate the co-ordinates if point P (0,0,0) is translated by 3i +2j – 4k and then is scaled uniformly by a factor of 2 with reference to point A(7,5).	6
	B.	A scaling factor of 2 is applied in the Y direction while no scaling is applied in the X direction with respect to origin to the line whose two end points are at coordinates A(1, 3) and B(3, 6). Then line is to be rotated through 300°, in the counter clockwise about point C(7,4). Determine the necessary transformation matrix for the operation and the new coordinates of the end points.	6
Q. 2	A.	Describe following fundamentals of solid modeling: i. Set Theory ii. Regularised Set Operations iii. Set Membership Classification	6
	B.	How do you represent a stool with four tapered legs using CSG representation? Enumerate your answer with CSG tree and with a suitable sketch? Explain the Boolean operations carried out during the process.	6
		OR	
	B.	Explain the concept of Image Processing in the field of Computer Aided Inspection.	6
Q.3	A.	Explain the function and roll of knots in plotting Non Uniform Rational B-Spline.	6
	B.	Derive the parametric equation of Hermite Cubic spline.	6
		OR	
	B.	Describe with suitable diagram the cell layouts used in Cellular Manufacturing.	6
Q. 4	A.	Differentiate between FMS, FMC and FMM.	6
	B.	What is Production Flow Analysis and describe rank order algorithm with its mathematical expression.	6
		OR	

	C.	Write a part program for manufacturing a plate having holes as indicated in figure given below in which tool position is mm: 	6
Q. 5	A.	Write a part program for milling a job as indicated in figure given below. All dimesions are in mm. Cutter position is at (0,0,0). 	6
	B.	Write Short notes on: 1) Canned Cycles 2) 'P', 'L', and 'C' type NC systems	6
		OR	
	C.	Explain with the help of a neat sketch the axis nomenclature for a CNC turning center or vertical machining center.	6