Total No. of Questions : 12]

SEAT No. :

P3311

[Total No. of Pages : 4

[4959]-32

B.E. (Mechanical)

CAD / CAM and Automation

(2008 Pattern)

Time : 3 Hours] *[Max. Marks : 100*

Instructions to the candidates:

1) ***Answer two sections in two separate answer books.***
2) ***Answer Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8, Q9 or Q10 and Q11 or Q12.***
3) ***Neat diagrams must be drawn wherever necessary.***
4) ***Figures to the right side indicate full marks.***
5) ***Use of calculator is allowed.***
6) ***Assume suitable data if necessary.***

SECTION - I

Q1) a) Explain reflection of geometrical entity about line y = mx + c, with schematic representation and write concatenated transformation matrix. **[6]**

b) Find concatenated matrix if the transformations are performed as per the following sequence. **[10]**

i) Rotation through 30^o anticlockwise.

ii) Translation through 4 and 5 units along the x and y directions.

What is the effect of above transformations on triangle having co-ordinates A (0, 0), B (5, 0) and C (0, 5).

OR

Q2) a) Compare Geometrical transformation and mapping. **[4]**

b) A tetrahedron is defined by the following points A(2,3,5), B(6,3,5), C(2,5,5) and D(4,4,10) with a transformation matrix generate data for the orthographic view of the object in viewing plane. Also sketch the three views. **[12]**

P.T.O.

Q3) a) Explain non parametric and parametric curves. Compare its mathematical formulations for line and advantages of parametric representation of line. **[6]**

b) A circle is represented by centre point (5, 5) and radius 10 units. Find parametric equation of circle by recursive method and determine the various points on the circle if increment of angle is 30^{o}. **[10]**

OR

Q4) a) Plot the hermite cubic spline curve for the points at the value of u = 0, 0.2, 0.4, 0.6, 0.8 and 1 having the end points P0(2,2) and P1(6,8). The tangent vector for end P0 is defined by the line between P0 and another point P2(6,8) whereas the tangent vector for end P1 is defined by the line between P1 and point P3(8,7). **[10]**

b) Specify different methods of solid modeling. Explain feature based modeling. **[6]**

Q5) a) An axial step bar is shown in figure 1. It is subjected to axial pull P of 10 kN. If material of bar is uniform and having a modulus of elasticity as 150 GPa. Determine deflection and stresses in each element and reaction force. **[12]**

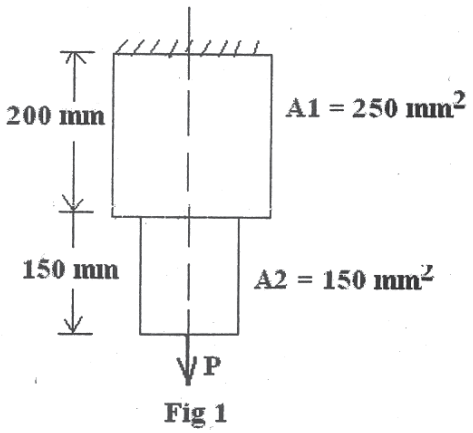


Fig 1

b) Derive the stiffness matrix for 1-D problem. **[6]**

OR

Q6) a) A two bar truss is shown in figure 2. Solve the problem as FEM problem and find Nodal displacement & stress. **[12]**

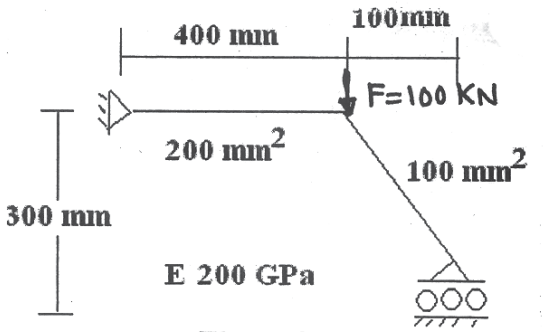


Figure 2

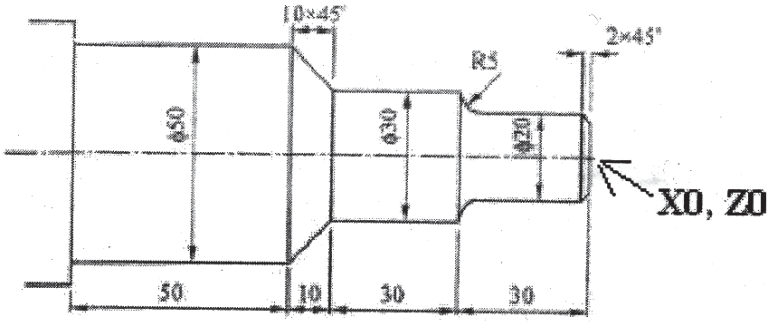
b) Explain plane stress and plane strain with suitable example. **[6]**

SECTION - II

Q7) a) Explain fixed Zero and floating zero for CNC machine. **[4]**

b) Write a G code to draw circle having center (0, 0), starting and end point (10,00 and radius 10 when cut is taken clockwise and anticlock wise. **[4]**

c) Write a CNC part program to take a finish cut for the shape shown in the figure. Assume suitable machining data. **[10]**



OR

Q8) a) What are different Adaptive Control in NC machines and its advantage over NC system. Explain any one in detail. **[8]**

b) Explain the concept of Sub programming in NC programming. **[4]**

c) Explain canned cycle for peck drilling and tapping. **[6]**

Q9) a) Compare various types of automation. **[8]**

b) Explain OPTIZ part classification and coding system in Group technology. **[8]**

OR

Q10) a) Explain Machining centre. **[8]**

b) What are the various elements of Flexible Manufacturing system? **[8]**

Q11) a) Explain the various terminologies used in Robot. **[8]**

b) Explain articulated configuration robot with application and draw its work envelope. **[8]**

OR

Q12) a) List various programming technique for Robot. Write short note on teach pendant method of programming. **[8]**

b) List various types of gripper with one application. What is the consideration in selection of Gripper. **[8]**

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