Total No. of Questions : 6] **SEAT No. :**

P4877 **[Total No. of Pages : 2**

B.E. /Insem. - 15
B.E. (Mechanical)
CAD/CAM & AUTOMATION
(2012 Pattern) (Semester - I)

Time : 1 Hour] ***[Max. Marks : 30***

Instructions to the candidates:

1) ***Answer three questions.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right side indicate full marks.***
4) ***Assume Suitable data if necessary.***

UNIT - I

Q1) a) A line is drawn between P_1 (2, 4) and P_2 (6, 8) is rotated by 30° in CCW direction about point P1. Derive concatenated transformation matrix and find new coordinates of line after transformation. **[6]**

b) Explain the importance of Homogeneous Representation in Computer Graphics. **[4]**

OR

Q2) a) Discuss the Concept of Rotational Mapping. **[4]**

b) A Tetrahedron is defined by the following points A (2,3,4), B (6,3,4) C (2,5,4) and D (4,4,10). With a transformation matrix generate data for the orthographic Top and Front view of the object in viewing plane. **[6]**

UNIT - II

Q3) a) Compare the Performance of Analytic and Synthetic Curves in Geometric Modelling. **[4]**

b) A circle is represented by center point (5, 5) and radius 6 units. Find parametric equation of circle and determine the various points on the circle in first quadrant if increment of angle is 45° and 90°. **[6]**

P.T.O.

OR

Q4) Find the points on the Hermite Cubic Spline curve at the value of u = 0, 0.2, 0.4, 0.6, 0.8 and 1 having the end points P_0 (1, 1) and P_1 (7, 4). The tangent vector for end P_0 (5, 6) and P_1 (10, 7). **[10]**

UNIT - III

Q5) An axial step bar is shown in Figure 1. It is subjected to axial pull of 10 KN. Determine deflection element and reaction force. **[10]**

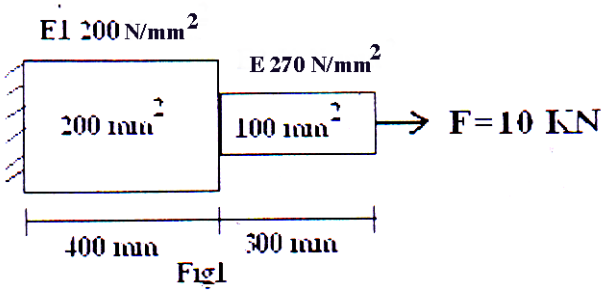

Fig1

OR

Q6) a) Explain the concept of shape function for 1 - D element. **[4]**

b) Find the deflection and reaction of a cluster of spring fig. 2 by FEM. **[6]**

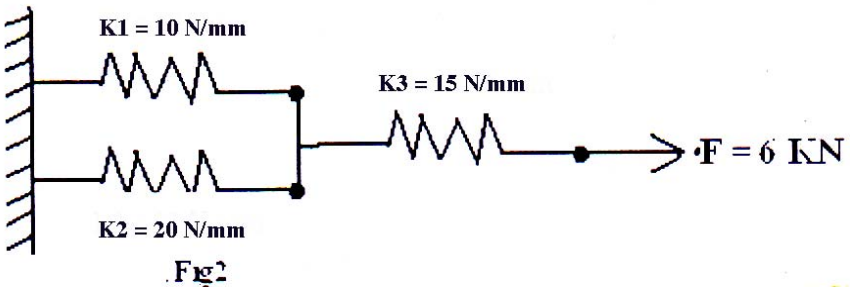

Fig2