

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  $30^\circ$  in CCW direction about point  $P_1$ . 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  $45^\circ$  and  $90^\circ$ . [6]

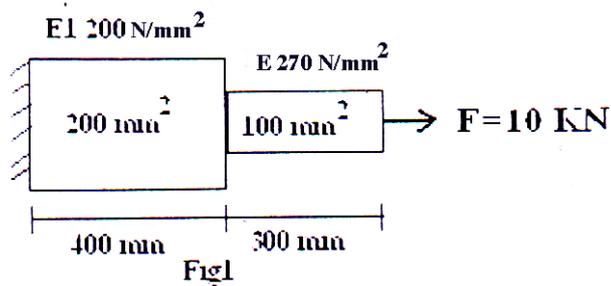
**P.T.O.**

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  $10 \text{ KN}$ . Determine deflection element and reaction force. [10]



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]

