18/11/13

Roll No. | | | | | | | | | | |

B.E / B.Tech (Full Time) DEGREE END SEMESTER EXAMINATIONS, NOV / DEC 2013

MANUFACTURING ENGINEERING

Fifth Semester

MF9304 - Computer Aided Design

(Regulation 2008)

Time: 3 Hours | Answer ALL Questions | Max. Marks 100

PART-A (10 x 2 = 20 Marks)

1. Mention the benefits of CAD in Manufacturing
2. Differentiate between workstation and server.
3. With a suitable transformation matrix show how shearing is accomplished on a unit cube.
4. What is concatenation of transformation matrix?
5. Differentiate between interpolation and approximation method for generating control points of splines.
6. What is a 21/2 D model? Sketch some examples.
7. Show that the 2 x 2 matrix represent pure rotation.

$$[T] = \begin{bmatrix} \frac{1+2t}{1+t} & \frac{-t}{1+t} \\ \frac{t}{1+t} & \frac{1}{1+t} \end{bmatrix}$$

8. Mention any two salient features of DXF
9. List out different type of elements used in FEM
10. What is the advantage of using FEM for engineering analysis problem?

Part – B (5 x 16 = 80 marks)

11. A square with an edge length of 10 units is locted in the origin with one of the edge at an angle of 30° with the +X axis. Calculate the new position of the square it it is rotated about Z axis by an angle 30° in the clockwise direction.

12. a) Describe the following input devices:
    i. Digitizer
    ii. Mouse
    iii. Light pen.
    iv. Keyboard

(OR)

b) With neat sketch, discuss the Product life cycle.

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13. a) For given starting and ending points A (1, 2)and B (3, 1) with corresponding slopes 60° and 30°, draw Hermite cubic spline with minimum of three intermediate points between given starting and ending points.

(OR)

b) What is surface modeling? How does it differ from wire frame modeling? List 8 types of surface and explain their characteristics.

14. a) What are the needs for standardization in CAD software? Explain in detail graphical kernel system.

(OR)

b) Write the full form of IGES, STEP, DMIS and PDES. Explain briefly about any two of the above mentioned standards?

15. a) Figure 1 shows a thin plate having a uniform thickness t = 10 mm and modulus of elasticity E = 2 X 10^5 N/mm^2 and density γ = 7.85 g/cm^3. In addition to its self weight, it is subjected to a point load P = 1000N at its free end. The plate has a taper with 100 mm at free end 200 mm at the fixed end. Using two 1D linear elements determine displacement and stress at each node.

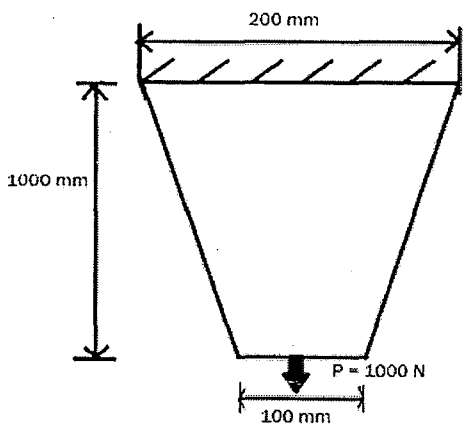

Figure 1

(OR)

b) (i).What are the steps involved in the finite element analysis of a typical problem?
(ii).Derive an expression for shape functions of one dimensional linear element.