FIFTH SEMESTER B TECH DEGREE EXAMINATION NOVEMBER 2015

BRANCH: INDUSTRIAL ENGINEERING

SUBJECT: **13.506.3 COMPUTER AIDED DESIGN (N)**
(ELECTIVE)

TIME 2 HRS   MAX. MARKS 50

ANSWER ALL QUESTIONS IN PART A AND FULL QUESTION FROM EACH MODULE IN PART B

PART A

1) Draw Layout indicating design steps   and related software tools used in each stages .

2) Write requirement of a CAD work station with special reference to higher end specifications

3) Distinguish stroke writing and raster scanning

4) Describe various co ordinate system used in CAD

5) End points of a line are A (1, 3) and B (4, 5.   Find the co-ordinates of the new line A'B' if it is

   a) Translated through a distance of 4 units in the X-direction and 3 unit in Y direction.

   b) Rotated through an angle of 30 degrees about its midpoint.

6) Write examples on MATLAB coding for simple matrix operations

7) Explain the concepts of

   a) Cohen-Sutherland Algorithm   b) Mid-point sub division algorithm

8) Briefly explain steps in finite element method. Based on that explain steps to analyze an Engineering problem using ANSYS.

9) Discuss different types of Finite element used for the analysis .

10) Explain the use of shape functions in FE analysis

(10 x 2 = 20 Marks)

PART B
MODULE I

11.a) Explain the advantages of CAD with special reference to the launching of a new product

11.b) With neat sketches explain the working principles of different types of display devices

OR

12.a)Explain the features available in five software packages for Design and Analysis

12.b) With neat sketches explain the working of different types of printing devices

MODULE II

13.a) With neat sketches explain the working principles of input devices in CAD

13.b) Discuss Bresenhams algorithm for line generation

OR

14.a) Write notes on i) Concepts on 3D range data acquisition ii) Reverse Engineering

iii) 3D scanning

14.b) Discuss Bresenhams algorithm for circle generation

MODULE III

15.a) Discuss the concepts on window to viewport mapping

15.b) Discuss mathematical formulation of 3D Transformation

OR

16.a) Discuss different types of 3D modelling techniques used in CAD

16.b) A parallelepiped having co-ordinates A(0,0,0) B(3,0,0) C(0,2,0) D(0,0,1) E(3,2,1) F(3,2,0) G(3,0,1) H(0,2,1). Write concatenated transformation matrix to Perform rotation about all the 3-axis through an angle of 30 degrees.

MODULE IV

17.a) Derive the Element Stiffness equation for a Truss element. Also write the transformation Mtrix to transfer displacement in global co rdinate system to axial co ordinate system

17.b) Formulate the Global stiffness matrix to find stress in each member of the

following structure below
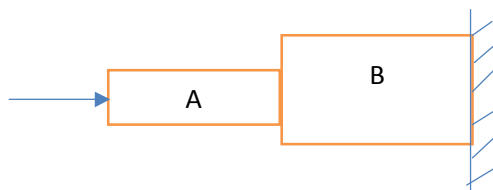
Diameter of A: 10cm
Diameter of B: 20 cm
L1=L2= 10 cm
Force, F=200N, E=2 X 10^5N/mm^2

OR

18.a) Formulate element stiffness matrix for a beam element

18.b) Write notes on FE formulation of 1D Structural, Thermal and vibration problems

(4 X 20 = 80 Marks)