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**B.E. (Full Time) End Semester DEGREE EXAMINATION, APRIL / MAY 2011**

Fifth Semester

Manufacturing Engineering

**MN 374 – COMPUTER AIDED DESIGN**

(Regulation 2004)

Time : 3 Hours

Answer ALL Questions

Max. Marks 100

**PART-A (10 x 2 = 20 Marks)**

1. What is FEM? Name at least four commercial finite element softwares rigorously used in engineering industries.
2. Derive the stiffness matrix for the assembly of two springs.
3. Explain the common editing features available on a CAD system.
4. List the major benefits of CAD in Design of Machine Elements.
5. State the similarities and dissimilarities between “window and view port”.
6. What is “concatenated matrix”? Explain with suitable example.
7. Differentiate between “mainframe and mini workstation”.
8. Write short notes on “reflection transformation”.
9. List the benefits of “graphic standards”.
10. Explain the various facilities available in a typical solid modeler.

**Part - B ( 5 x 16 = 80 marks)**

11. a) Using a detailed description of the product cycle, consider where computational aids might be of assistance to the designer. What features of computers are likely to contribute to their usefulness, and what features may limit their application. Compare the conventional product cycle and computer aided product cycle.
  12. a) i) What are the important sources of errors in the finite element analysis solutions? (4)  
ii) Explain the assembly procedure used to get global stiffness matrix from the element stiffness matrix. (4)  
iii) Explain the various steps followed in FEM, with an example. (8)
- OR**
- b) Explain the following with respect to FEA.
    - i) Element Types
    - ii) Finite element solution techniques
    - iii) Pre & Post Processing.
13. a) Explain the various types of solid modeling techniques. Compare how the models are stored in CSG and B-rep technique.

**OR**

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- b) Explain the following in Detail :
  - i) Difference between wire frame, solid and surface modeling
  - ii) Sweep and Analytical Solid Modeling.

- 14. a) Explain the following in detail :
  - i) Graphical Kernel System (GKS)
  - ii) Programmers Hierarchical Interface for Graphics (PHIGS)

**OR**

- b) Explain the following in detail :
  - i) Standard for Exchange of product Model Data (STEP)
  - ii) Drawing Exchange Format (DXF)

- 15. a) A triangle is defined in a two dimension system by its vertices (0,2) (0, 3) and (1,2). Perform the following transformations on this triangle.
  - i) Translate the triangle in space in 2 units in the x direction and 5 units in the y direction.
  - ii) Scale the original triangle by a factor of 1.5
  - iii) Scale the original triangle by a factor of 1.5 in the x direction and 3 in the y direction.
  - iv) Rotate the original triangle by 45 degrees about the origin.

**OR**

- b) Write a detailed account about "Clipping".