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B.E. DEGREE END SEMESTER EXAMINATIONS, APRIL/MAY 2013
MANUFACTURING ENGINEERING BRANCH
FIFTH SEMESTER - (REGULATIONS 2008)
MF 9304 COMPUTER AIDED DESIGN

14

Time: 3 Hours

Max. Marks: 100

PART-A

(10 x 2 = 20 Marks)

1. What are the benefits of implementing CAD?
2. List the various output devices used in CAD and write about any one.
3. Distinguish between World coordinate system and User coordinate system.
4. Derive the rotation transformation matrix.
5. With neat sketches list some Solid modeling primitives.
6. Differentiate between Implicit and parametric representation of curves.
7. What is meant by GKS?
8. What is the function of the array/pattern command used in modeling systems?
9. What are the properties of stiffness matrix?
10. List the different types of boundary conditions used in finite element analysis.

PART-B

(5 x 16 = 80 Marks)

11. i) With the help of a neat sketch explain the importance of a common database on the various activities involved in CAD/CAM (8)
- ii) What is the requirement of networking? Briefly describe with the aid of sketches Star and Ring networks. (8)
- 12.a.i) Briefly explain the various graphic transformations used for manipulating the geometric entities in CAD. (8)
- ii) A triangle whose co-ordinates are given by: A (3,0), B(4,-5), C(4,5) is translated by 3 units in the X direction and 2 units in the Y direction. It is then rotated above the origin by 45°. Give the concatenated transformation matrix. (8)

OR

- 12.b.i) Explain the importance of clipping. Explain in detail the methods used for clipping (10)
- ii) Describe briefly the need for hidden line removal and how it is achieved. (6)

13.a.i) Explain what is meant by Geometric modeling. What are the expected outcomes of geometric modeling? (8)

ii) Distinguish between wire frame, surface and solid modeling techniques. (8)

OR

13.b.i) Briefly describe the concept behind the generation of cubic splines, Bezier curves and B-spline curves. (8)

ii) Explain with a suitable example how a three dimensional solid is created using CSG technique (8)

14.a.i) Explain the need for exchange of modeling data. Describe in detail the structure of IGES file format (8)

ii) Describe the various methods of generating circles using drafting systems. (8)

OR

14.b.i) Distinguish between direct and neutral translators. (8)

ii) Explain the basic differences between STEP and DXF file translators (8)

15.a.i) With neat sketches list the various types of elements used in 1D, 2D and 3D Finite element analysis? (4)

ii) Derive stiffness matrix for a two noded 1D axial element. (6)

iii) What is meant by Assembled stiffness matrix? (6)

(OR)

15.b.i) List atleast four software used for finite element analysis. (3)

ii) Determine the nodal displacements, element stresses and support reactions for the stepped bar loaded as shown in Fig.12.a $P_1 = 60$ kN and $P_2 = 75$ kN. The details of each section of the bar are tabulated below: (13)

Portion	Material	E (GPa)	Area (mm ²)
A	Bronze	83	2500
B	Aluminium	70	1250
C	Steel	200	650

