Sixth Semester B.Tech. Degree Examination, May 2011
(2008 Scheme)
08.603 : COMPUTER AIDED DESIGN (MPU)

Time : 3 Hours
Max. Marks : 100

PART – A

Answer all questions. Each carries 4 marks.

1. Discuss the applications of computer in design.
2. Describe a raster scan display.
3. What are the functions of a design workstation?
4. Give an account of graphic input devices.
5. What is meant by windowing and clipping?
6. Discuss the various three dimensional transformations.
7. Describe an algorithm for the removal of hidden lines.
8. Discuss the various considerations for discretisation in FEA.
9. Explain the different types of shape functions.
10. Explain the procedure for assembly of global stiffness matrix. (10x4=40 Marks)

PART – B

Answer one full question from each Module. Each question carries 20 marks.

Module – I

11. a) Describe the steps involved in the design process.

b) Explain how images are created in liquid crystal displays.

OR
12. a) What are the components of a Design Database?
   b) Write notes on:
      i) Graphic standards
      ii) Virtual reality.

Module – II

13. a) Describe Bresenham’s algorithm for generating circle.
   b) What is geometric modeling? Explain geometric models, bringing out their
      limitations and applications.

OR

14. a) What are the considerations to be made in designing a graphic software?
   b) A triangle ABC defined by its end points A(4, 1), B(5, 2), C(4, 3) is rotated
      $90^\circ$ in anticlockwise direction about a point (2, 1). Obtain the result of
      transformation.

Module – III

15. a) Explain the principle of minimum potential energy. How is it related to FEM?
   b) What are the different types of elements used in FEM? What is nodal
      connectivity?

OR

16. a) Derive the element stiffness matrix for a truss element.
   b) Consider a bar of 200 mm length, 750 mm$^2$ cross sectional area and Young’s
      modulus $2 \times 10^5$ N/mm$^2$, as shown in the Fig. 1.

![Diagram](image)

Fig. 1.

If displacement at node 1, $q_1 = 0.5$ mm and displacement at node 2, $q_2 = 0.625$ mm, calculate the following:

i) Displacement at point P
ii) Stress
iii) Strain
iv) Element stiffness matrix and
v) Strain energy.

(3x20=60 Marks)