

IV B.Tech I Semester Supplementary Examinations, November 2005
COMPUTER AIDED ANALYSIS
(Civil Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
 All Questions carry equal marks

1. Explain various features of Computer Aided Design Process. [16]
2. Explain various types of graphic terminals used in Computer Aided Design. [16]
3. Write about the following with examples.
 - (a) Translation
 - (b) Rotation
 - (c) Scaling. [16]
4. A rigid portal frame ABCD is fixed at the supports A and D. Vertical members AB and CD are equal to 4 m. The horizontal member BC is 5 m long and carries a central concentrated load of 60 kN. Analyse the portal frame using stiffness matrix method. [16]
5. Explain fundamental concepts in Finite difference method and explain how it can solve complicated engineering problems. [16]
6. Explain the procedure for solution of settlement under a raft foundation using finite difference method. Discuss the effect of closely spaced pivotal points. [16]
7. Reduce the system of equations

$$2x_1 + 3x_2 - 2x_3 - 7x_4 = 1$$

$$x_1 + x_2 + x_3 + 3x_4 = 6$$

$$x_1 - x_2 + x_3 + 5x_4 = 4$$
 into a canonical form with x_1 , x_2 and x_3 as the basic variables. [16]
8. Given the following linear programming problem :

Maximize $z = -x_1 + 2x_2 - x_3$

Subject to $3x_1 + x_2 - x_3 \leq 10$, $-x_1 + 4x_2 + x_3 \geq 6$

$$x_2 + x_3 \leq 4, x_1, x_2, x_3 \geq 0$$
 - (a) Determine an optimal solution to the problem
 - (b) Determine the ranges for discrete changes in the components b_2 and b_3 of the required vector so as to maintain the optimality of the current optimum solution. [16]
