CODE NO: NR410101NR

USN

2005 JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

IV B.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS
COMPUTER AIDED ANALYSIS
(CIVIL ENGINEERING)

TIME: 3 HOURS

NOVEMBER 2005

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 differnce method. Discuss the effect of closely spaced pivotal points.   [16]

7. Reduce the system of equations
$2x1+3x2-2x3-7x4 = 1$
$x1+x2+x3+3x4 = 6$
$x1-x2+x3+5x4 = 4$ into a canonical form with x1, x2 and x3 as the basic variables. [16]

8. Given the following linear programming problem :
Maximize $z = -x1+2x2-x3$
Subject to $3x1+x2-x3$ 10, $-x1+4x2+x3$ 6
$x2+x3$ 4, $x1, x2, x3$ 0

(a) Determine an optimal solution to the problem

(b) Determine the ranges for discrete changes in the components b2 and b3 of the required vector so as to maintain the optimality of the current optimum solution.