Total No. of Questions : 12]

SEAT No. :

P3504

[Total No. of Pages : 3

[4959]-9

B.E. (Civil)

MATRIX METHODS OF STRUCTURAL ANALYSIS

(2008 Pattern) (Elective - II) (Semester - I)

Time : 3 Hours] *[Max. Marks : 100*

Instructions to candidates:

1) *Answers to the two sections should be written in separate books.*
2) *Nest diagram must be drawn whenever necessary.*
3) *Figures to the right indicate full marks.*
4) *Your answers will be valued as a whole.*
5) *Use of electronic pocket calculator is allowed.*
6) *Assume suitable data if necessary.*

SECTION - I

Q1) Explain in detail **[16]**

a) Ill conditioned matrix

b) Importance of Matrix Algebra in Matrix Methods of structural analysis.

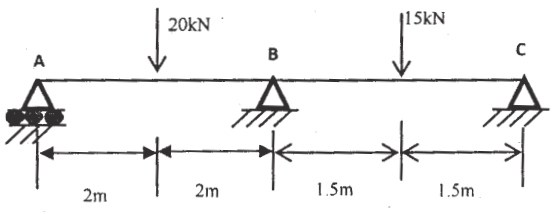
OR

Q2) a) Write a note on "Computer algorithm and programming aspects". **[6]**

b) Solve the following equations by Gauss Eliminating Method **[10]**

$$15X_1 - 6X_2 + 12X_3 = 15$$
$$-6X_1 + 3X_2 + 3X_3 = 3$$
$$12X_1 + 3X_2 = 18$$

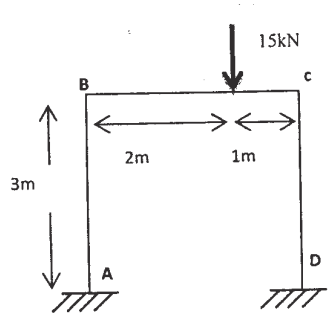
Q3) Analyze the beam shown below by flexibility method (EI is constant) **[16]**



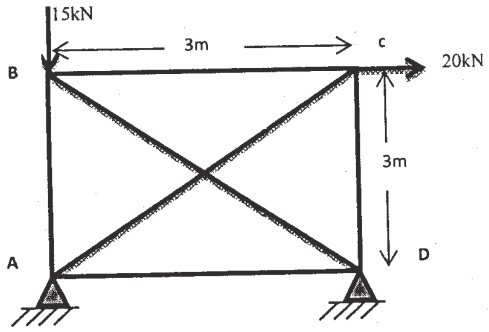
OR

P.T.O.

Q4) Analyze the portal frame using Flexibility Method (EI Constant) **[16]**



Q5) Analyze the truss by Flexibility Method (EI Constant) **[18]**



OR

Q6) Analyze the beam shown in Ex. 3 by Stuffness Method (EI Constant) **[18]**

SECTION - II

Q7) Write a note on (any two) **[16]**

a) Force Method of structural analysis.

b) Determinacy and Indeterminacy.

c) Effective node numbering.

OR

Q8) a) Explain how support conditions are accounted in structure approach and member approach. **[8]**

b) State and explain transformation matrix. **[8]**

Q9) Using proper DOF's, write stiffness matrix equation for a member of orthogonal grid structure and also explain properties and special characteristics of stiffness matrix of a structure **[16]**

OR

Q10) Stating clearly DOF's, explain stiffness matrix for space truss member and space frame member. In which case you need transformation matrix. Explain reason. **[16]**

Q11) A single bay two storied frame is to be analyzed by computer programme of stiffness matrix method **[18]**

a) Prepare the flow chart for the programme and state input required for the same.

b) How will you input support conditions of the structure.

OR

Q12) Analyze and draw BMD for grid structure as shown below by stiffness method. **[18]**