

C020631(020)

**B. Tech. (Sixth Semester) Examination,
April-May 2022**

(AICTE Scheme)

(Civil Engineering Branch)

STRUCTURAL ANALYSIS by MATRIX METHOD

Time Allowed : Three hours

Maximum Marks : ~~80~~ 100

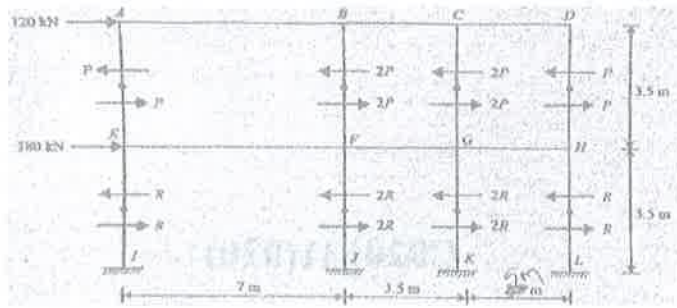
Min. Passing Marks 35

Note : Attempt all questions.

Unit-I

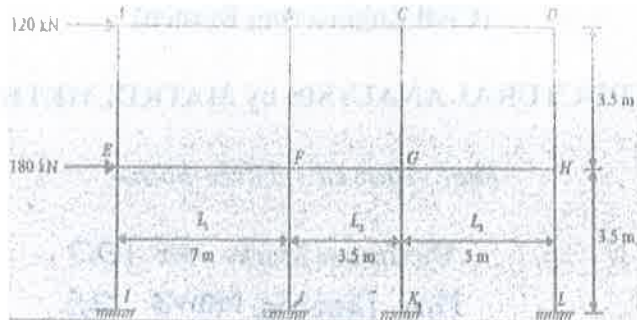
1. (a) Write assumption made in cantilever method of approximate method. 24
- (b) Analyse the building frame, subjected to horizontal forces as shown in figure use Portal method. 16

[2]



Or

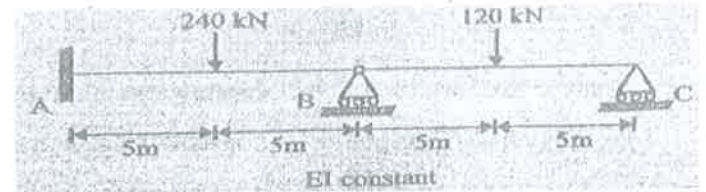
Analyse the structure given in fig. by using cantilever method assuming that all the column have the same area of cross-examination.



Unit-II

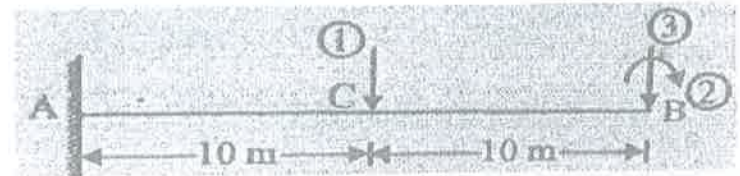
2. (a) Why flexibility method is called force method. 24
- (b) Analyse the continuous beam shown in figure. 14/16

[3]



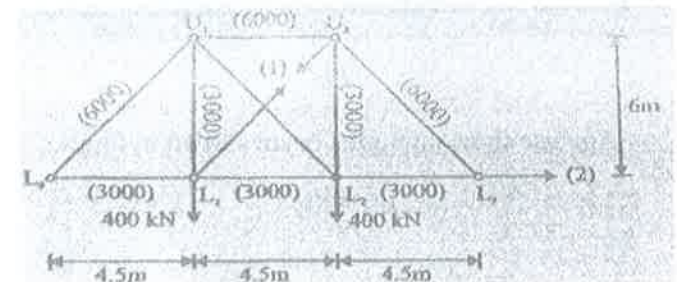
Or

Develop the stiffness matrices for the AB beam with reference to the coordinates shown in figures.



Unit-III

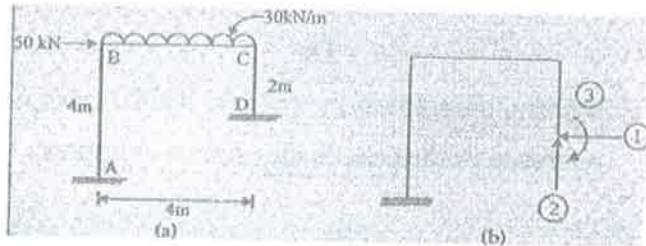
3. (a) Write any three properties of stiffness matrix. 24
- (b) Develop the flexibility matrix for the pin jointed plane frame with reference to coordinate 1 and 2 shown in figure the numbers in parentheses are the cross sectional areas of the members in mm². 14/16



[4]

Or

Analyse the portal frame $ABCD$ shown in figure by flexibility matrix method. EI is constant through out.



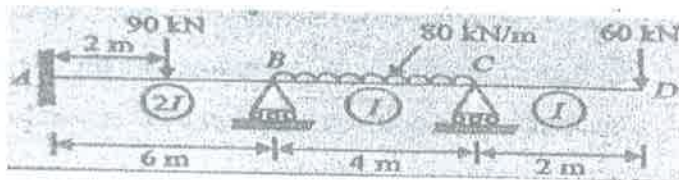
Unit-IV

4. (a) Explain constant strain triangle (CST).

24

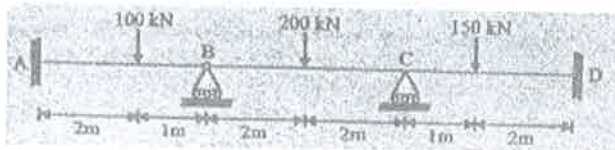
(b) Analyse the beam shown below by stiffness matrix method.

14/16



Or

Analyse the continuous beam shown in figure



[5]

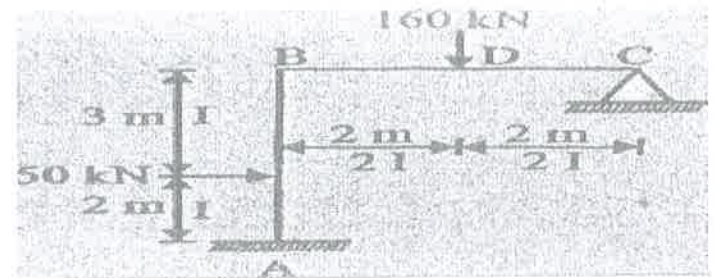
Unit-V

5. (a) Explain collapse mechanism and write types of mechanism.

24

(b) Analyse the structure shown in figure.

14/16



Or

Analyse the pin-jointed structure shown in figure. The cross section area of each member is 2000 mm^2 . Take $E = 200 \text{ kN/mm}^2$

