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C020531(020)

B. Tech. (Fifth Semester) Examination Nov.-Dec. 2021

AICTE (~~New~~ Scheme)

(Civil Engg. Branch)

STRUCTURAL ANALYSIS-II

Time Allowed : Three hours

Maximum Marks : 100

Minimum Pass Marks : 35

Note : *Attempt all questions. Part (a) from each question is compulsory. Attempt any* ***one*** *parts from parts (b), (c) of each question.*

1. (a) Calculate the static indeterminacies of below figures. 4

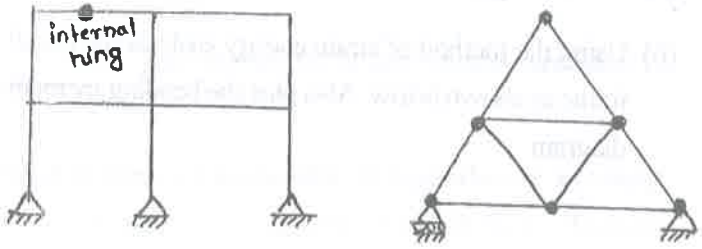

Fig. 1(a)

(b) For a two span beam shown below, find the support moment and reactions and plot the bending moment and shear force diagram by three moment equation. 16

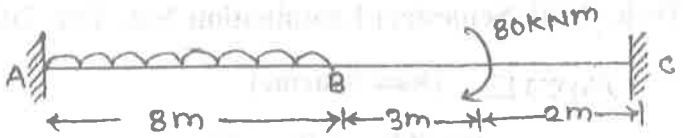

Fig. 1(b)

(c) A cantilever of uniform flexural stiffness is propped at the free end as shown below. Calculate the reaction on the propped when a load 30 kN is applied. Using the method of consistant deformation. 16

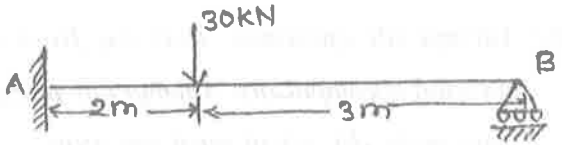

Fig. 1(c)

2. (a) State castigliano's theorem of minimum strain energy. 4

(b) Using the method of strain energy analysis the portal frame as shown below. Also plot the bending moment diagram. 16

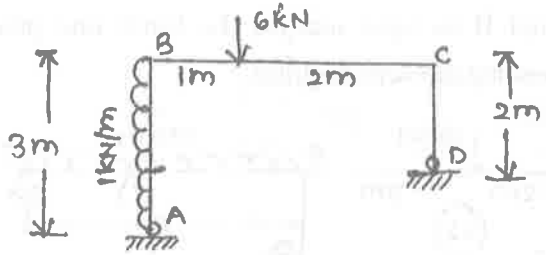

Fig. 2(b)

(c) A braced cantilever truss is loaded as shown in figure. All the members are of the same material and have the same cross sectional area. Find the axial forces in the in the member AD? 16

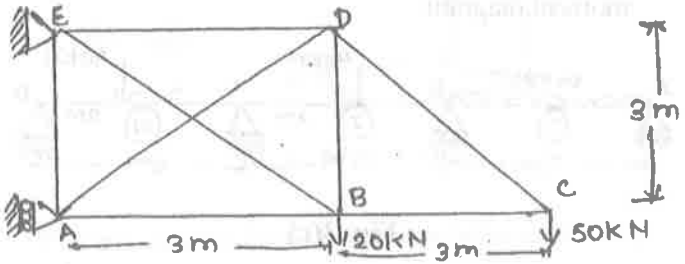

Fig. 2(c)

3. (a) Define absolute stiffness and relative stiffness of member. 4

(b) A continuous beam ABC is supported on an elastic column BD, and is loaded shown in figure. Treating

joint B as rigid, analyse the frame and plot the bending moment diagram. 16

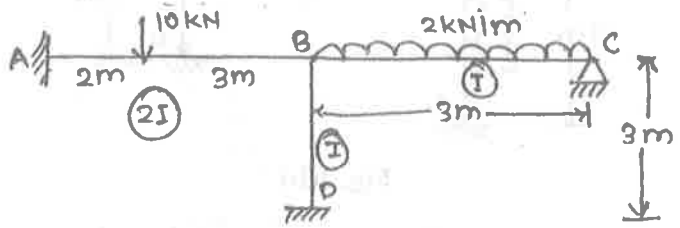

Fig. 3(b)

(c) Analyse the continuous beam ABCD shown in figure by moment distribution method. Draw bending moment diagram. 16

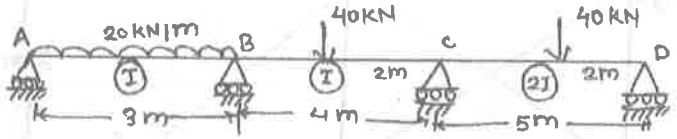

Fig. 3(c)

4. (a) What is the basic concept behind the column analogy method? Write the application of column analogy method. 4

(b) Analyse continuous beam and draw bending moment diagram using slope deflection method. 16

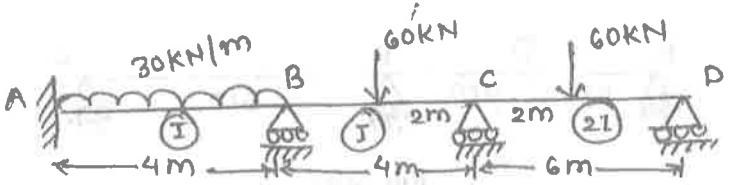

Fig. 4(b)

(c) Analyse the frame shown in figure using slope deflection method. 16

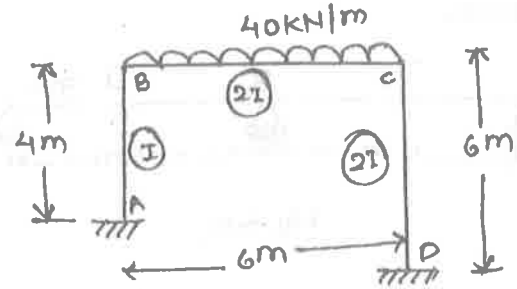

Fig. 4(c)

5. (a) What are influence line? Differentiate between bending moment diagram and influence line diagram. 4

(b) Using Mullers-Breslau principle, draw influence line diagram for the bending moment at the D middle point of span AD of a continuous beam shown below. Compute the ordinate at 1 m interval. 16

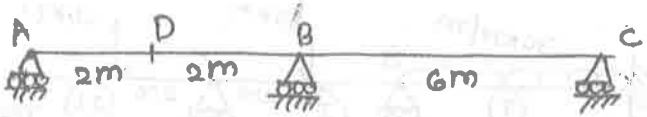

Fig. 5(b)

(c) Determine the influence line for shear force at D, the middle point of span BC of a continuous beam shown in figure. Compute the ILD ordinate at 1·5 m intervals. 16

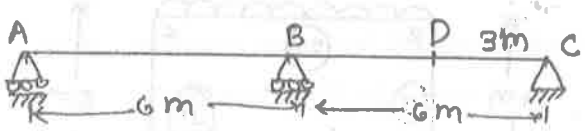

Fig. 5(c)