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320551(20)

B. E. (Fifth Semester) Examination, Nov.-Dec. 2021

(New Scheme)

(Civil Engg. Branch)

STRUCTURAL ANALYSIS-II

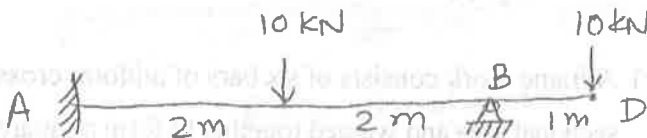*Time Allowed : Three hours*

Maximum Marks : 80

Minimum Pass Marks : 28

Note : *Part (a) from each question is compulsory. Solve any one part from (b) and (c).*
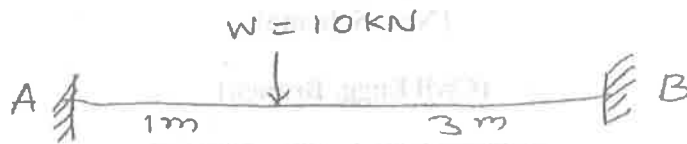
Unit-I

1. (a) Explain principle of superposition.   2

   (b) Find the prop reaction and fixing moments for a propped cantilever loaded as shown in figure.   14

(c) A beam AB of span 4 m is fixed at A and B and carries a point load of 10 kN at a distance 1 M from end A. Calculate the support moments by the method of consistent deformation. 14

W = 10 KN

A   1m   3m   B

Unit-II

2. (a) Discuss Minimum Strain Energy theorem.   2

   (b) Using castigliano's theorem of min strain energy, analyse the frame as shown in figure.   14

   10 KN → B   C
     4 m
   4 m   EI - Constant
     A   D
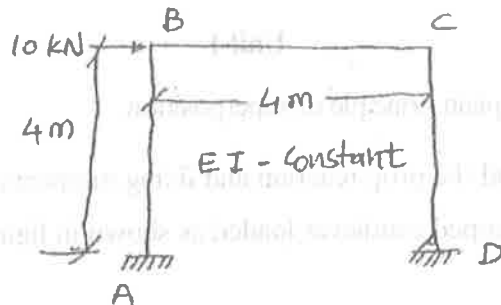
   (c) A frame work consists of six bars of uniform cross sectional area and winged together to form a square

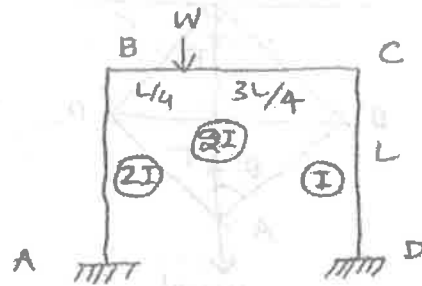with two diagonals is suspended from one end as shown in figure. Calculate the forces in all the member. 14

  C
B   T   D
  θ T
  A
  10KN
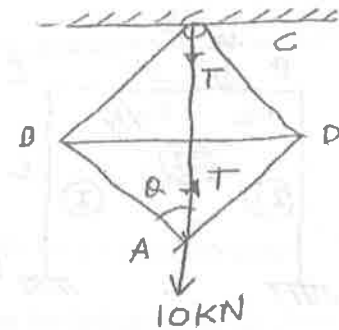
Unit-III

3. (a) Explain relation stiffness.   2

   (b) A continuous beam ABC 12 m long fixed at A and C and continuous over support B is loaded as shown in figure. Calculate the end moments and plot the bending moment digram.   14
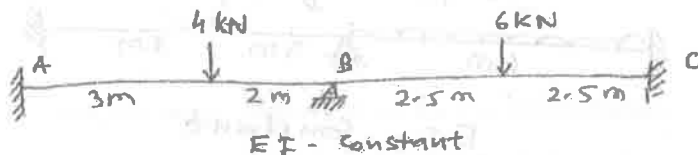
     2KN/m   B   12 KN
     6m   3m   3m
     EI - Constant
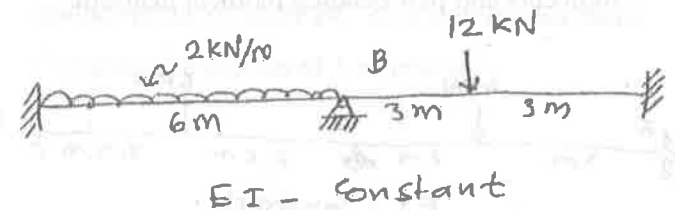
(c) A portal frame *ABCD* fixed at ends *A* and *B* carries a point load of *W* as shown in figure. Draw the bending moment diagram and sketch the deflected shape of the beam. 14

(c) A beam *AB* of span *L* is fixed at both the ends and carries a uniformly distributed load *W* per unit length. Using column analogy compute fixed end moments. 14

Unit-V

5. (a) Discuss Muller Breslau principle. 2

(b) Determine the influence line for *FA* for a continuous beam compute ordinates at every 1 m interval. 14

Unit-IV

4. (a) Write fundamental equations of slope deflection method. 2

(b) A beam *ABC* 10 m long fixed at ends *A* and *B* is continuous over *B* and loaded as shown in figure. Using slope deflection method. Compute the end moments and plot bending moment diagram. 14
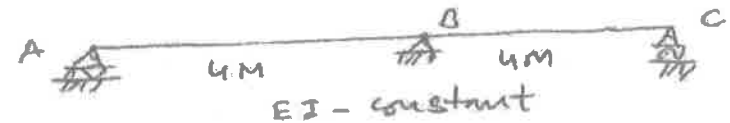
(c) Determine the influence line for shear force at D the middle point of span BC of a continuous beam. Compute the ordinat at 1 m interval. 14

ET – Constant

A — 4 m — B — 2 m — D — 2 m — C

[Unit-V]

8. (a) Discuss Muller breslau principle.

(b) Determine the influence line for H for a continuous beam compute ordinates at every 1 m interval.

(c) Determine the influence line for the shear force at D the middle point of span BC of a continuous beam. Compute the ordinate at 1 m interval.