SHAHEED BHAGAT SINGH STATE TECHNICAL CAMPUS, FEROZEPUR

ROLL No: | | | | | | | | | | | | | **Total number of pages:[4]**

B.Tech. || CIVIL || 5th Sem

STRUCTURAL ANLYSIS -II

Subject Code:BTCE-501A

Paper ID:

Time allowed: 3 Hrs **Max Marks: 60**

Important Instructions:

- **All questions are compulsory**
- **Assume any missing data**

PART A (10x 2marks)

Q. 1. Short-Answer Questions:

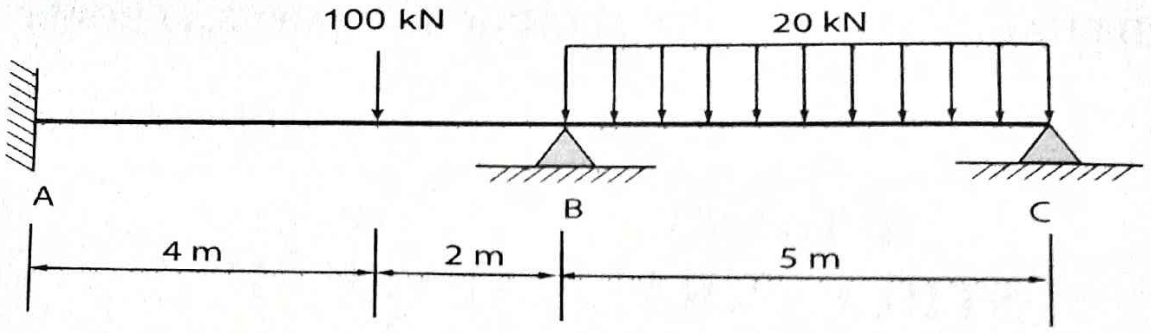
a) What are the assumptions made in the slope deflection equations.
b) How would you differentiate between statically determinate and indeterminate structures?
c) How would you explain the Muller Breslau principle?
d) How would you state the conditions for the maximum B.M at a section in a simply supported beam for a series of moving concentrated loads.
e) Mention any two methods of determining the deflections in the joints of a perfect truss.
f) What is ILD. State its importance.
g) Differentiate between the portal and cantilever method of solving the multi-storey frames.
h) How is the indeterminacy of a rigid frame calculated?
i) Differentiate between sway and non-sway frames by giving a suitable example.
j) How would you differentiate between distribution factor and rotation contribution factor.

PART B (5×8marks)

Q.2 A Continuous beam ABC with span AB = 6m and BC = 8m is simply supported at A and C, the beam carries a point load of 8KN at a distance of 3m from end A and a load of 8KN on the mid point of span BC. Determine the support moments using moment distribution method.

OR

Analyse the Continuous beam as shown in fig. By using Slope Deflection method



CO1

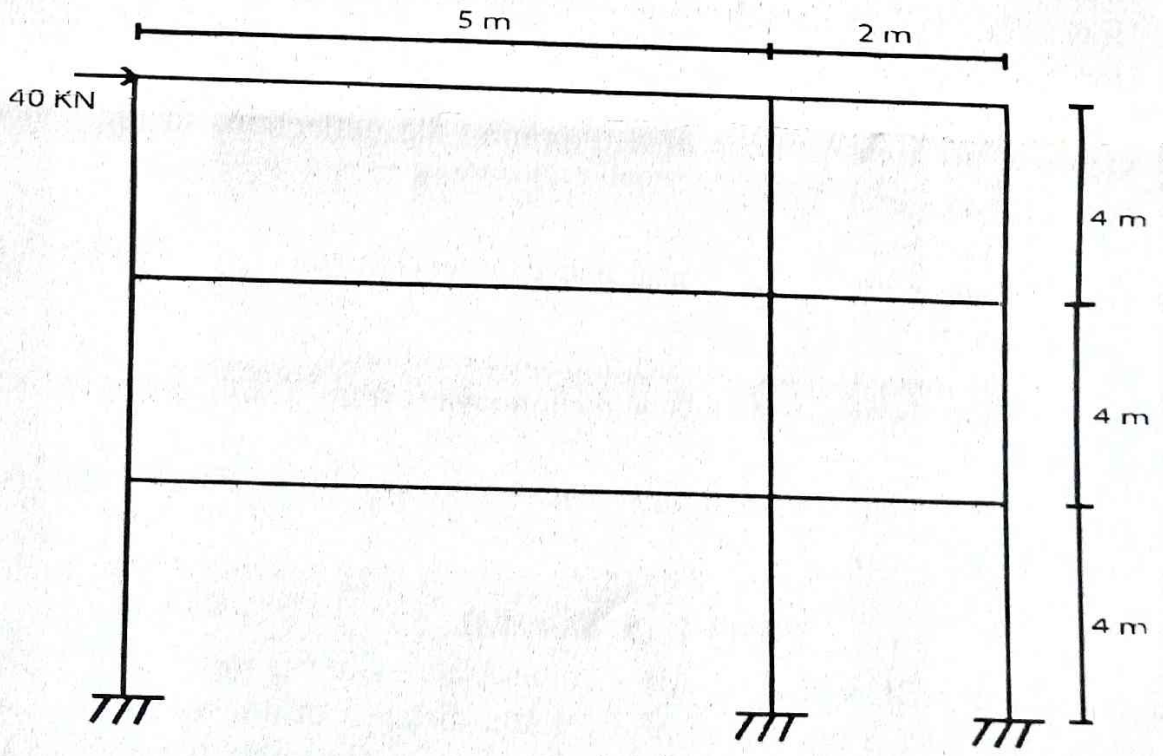
Q3. Prove that for a two span continuous beam ABC having span AB = l_1 and BC= l_2 moment equation is given as

$\mathbf{M_a l_1 + 2M_b(l_1 + l_2) + M_c l_2 = (6a_1 x_1)/ l_1 + (6a_2 x_2)/ l_2}$

Where a_1 and a_2 are the areas and x_1 and x_2 are the centroidal distances of the free B.M.D.

OR

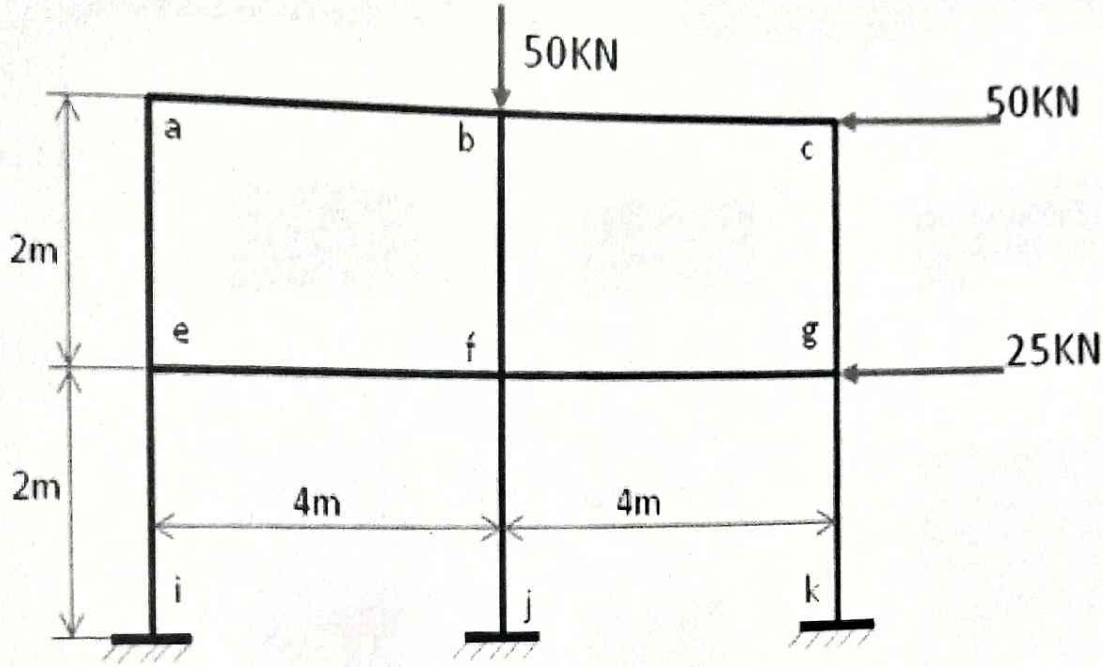
Analyse the given frame by using Portal method.



CO2

Q.4 A portal frame ABCD is hinged at the base and is loaded with a point load of 20KN at the middle point of the beam BC having a length oh 4m and a horizontal UDL of 1.2kn/m on the column AB, the vertical members AB and DC are of same cross-section each of 4m and I_{ab} and I_{bc} are equal. Find the reactions at the supports and draw the B.M.D. using rotation contribution method.

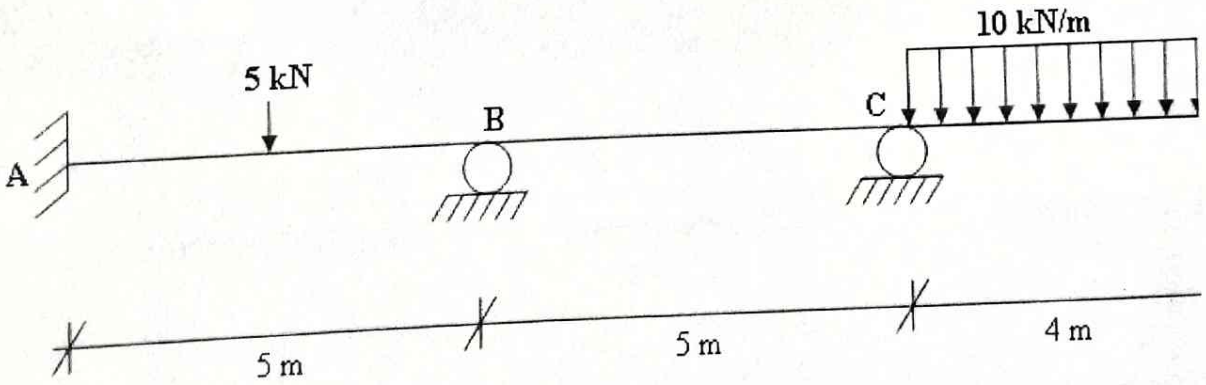
Analyse the given frame by using Portal method.



CO2

Q.5 Calculate the support moments and draw the B.M.D for the continuous beam by using Moment distribution method

EI = constant



OR

CO3

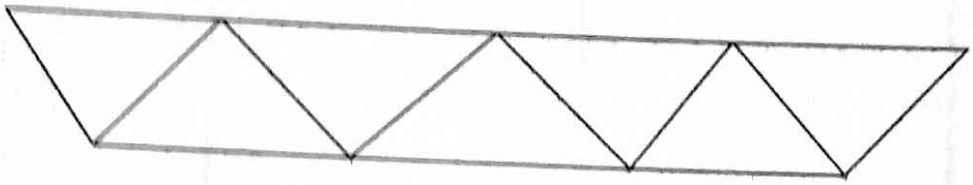
How are the slope deflection equations developed?.

Q.6 A span AB of length 20m, four wheel loads of 6,4,8 and 5 KN cross a girder from left to right followed by a U.D.L. 4 KN/m of 4m length, the 6 KN load is leading.

The spacing between the loads in the same order are 3m ,2m and 2m .The head of the U.D.L is at 2m from the last 5KN load. Calculate the S.F. and the B.M. at a section 8m from the left support when 4KN load is at the centre of the span, using Influence Lines.

OR

A warren girder having a span of 30 m consists of four equal panels shown in figure. Plot the influence line 'for force in all the members



All angels of 60^0

CO4