SHAHEED BHAGAT SINGH STATE TECHNICAL CAMPUS, FEROZEPUR

ROLL No: | | | | | | | | | | | | | **Total number of pages: 3**

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

STRUCTURAL ANLYSIS -II

Subject Code:BTCE-503

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) How would you differentiate between force and displacement method of analysis.
b) Write various assumptions made in the Portal method of analysis.
c) Define the clayperons theorem of three moments.
d) "If in a frame ,axis of symmetry passes through the column (interior)'',it is sufficient to analyze half of the frame in respect of kani's method ,give your comments.
e) What is the value of the fixing moment in a fixed beam carrying central load of 10KN and having span 2m.
f) How would you differentiate between Distribution factor and Rotation contribution factor.
g) How would you draw the ILD for the Shear force for a point in a cantilever.
h) Define the minimum strain energy theorem.
i) Define stiffness.

PART B (5×8marks)

Q.2 A continuous beam ABC, consist of span AB and BC of length 6m and 4m resp. The end A is simply supported while the end C is fixed. The span AB carries a U.D.L of 30 KN/m and the span BC does not carries any load. Find the support moments. Assume the beam to be of uniform section.

OR

How are the slope deflection equations developed CO1

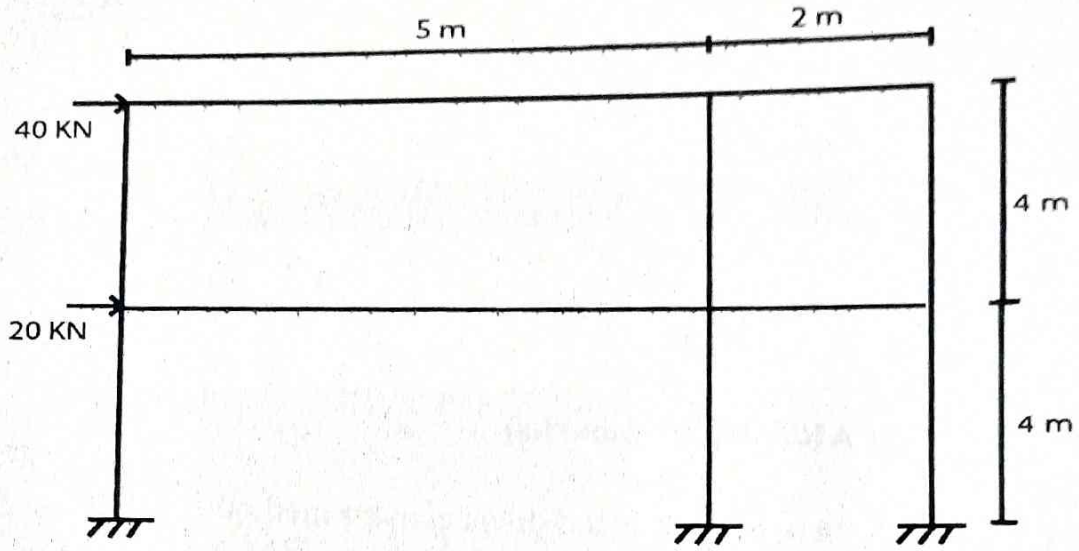
Q3. Prove that for a two span continuous beam ABC having span AB = l_1 and BC= l_2 moment equation is given as

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

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

OR

Analyze the given frame by using Cantilever method.



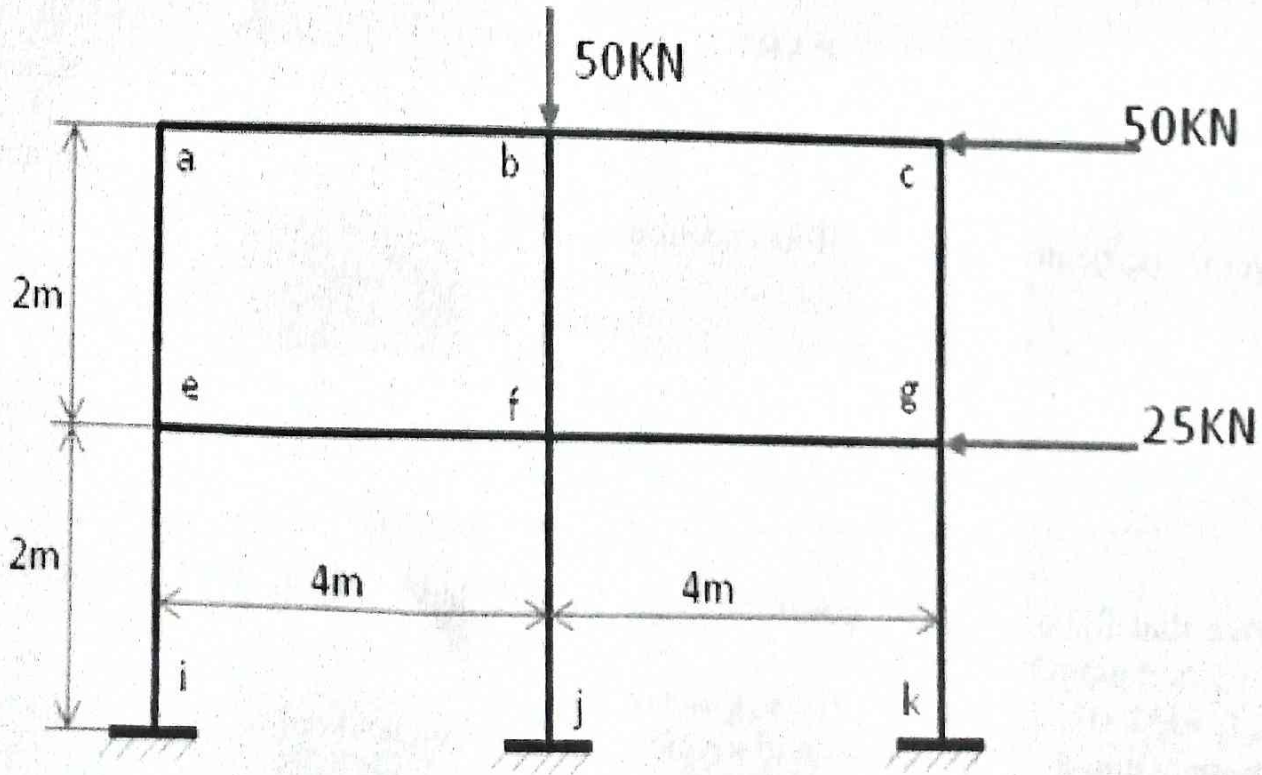
CO2

Q.4 A beam ABCD, 16m long is continuous over three spans: AB=6m, BC=5m, CD=5m, the support's being at the same level and simply supported. There is a UDL of 20KN/m over BC, there is a point load on AB of 80KN at 2m from A, on CD there is point load of 60KN at 3m from D. Calculate the moments and reaction at the supports and also draw the S.F.D and B.M.D, using three moments theorem.

OR

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

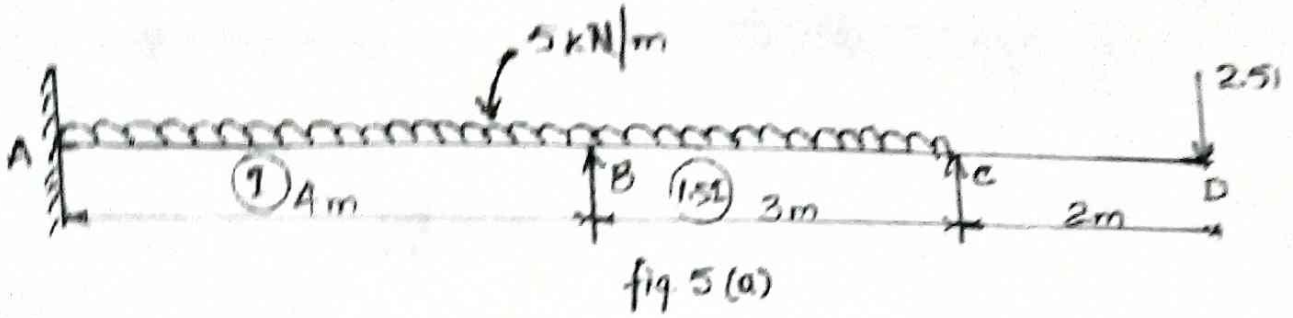


fig 5 (a)

OR

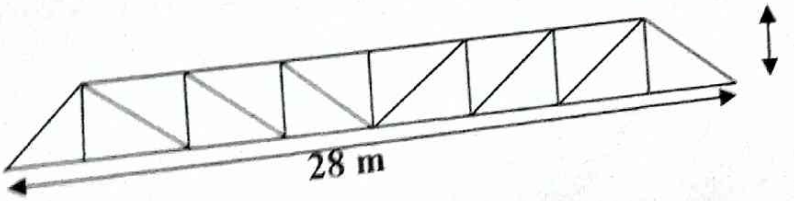
A continuous beam ABCD having spans AB, BC and CD of length 4m, 6m and 2m respectively. The beam is fixed at A and simply supported at D it carries a point load of 40KN at the mid span of AB, the span BC carries the UDL of 10KN/m and a point load of 20KN on the support D. determine the support moments using moment distribution method, if the support B sinks by 10mm. CO3

Take $E = 2 \times 10^5$ N/mm^2 and $I = 100 \times 10^6$ mm^4

Q.6 Three Wheel loads 80KN,60KN and 50KN spaced at 4m each roll on a span of 10m.find the greatest reactions at the supports and the absolute maximum B.M for the girder, using the influence lines.

OR

How would you analyze the Pratt truss with 8 panels shown in the fig. using the ILD.



CO4