ROLL No: ☐☐☐☐☐☐☐☐☐☐☐☐☐ Total number of pages: 3

Total number of questions: 06

B.Tech. || CIVIL || 5thSem

Re-appear
2015 onwards

STRUCTURAL ANLYSIS -II

Subject Code: BTCE-501A

Paper ID: M | 18

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 Cantilever method of analysis of multistory frames.
   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.
   j) How would you differentiate between force and displacement method of analysis.

PART B (5×8marks)

Q.2 A Continuous beam ABC with span AB = 5m and BC = 7m is simply supported at A and C, the beam carries a point load of 4KN at a distance of 2m from end B and a load of 6KN on the mid point of span BC. Determine the support moments using moment distribution method.

CO1

OR

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

CO1

45 kN   100 kN

1.25m 1.25m   2.5m   2.5m
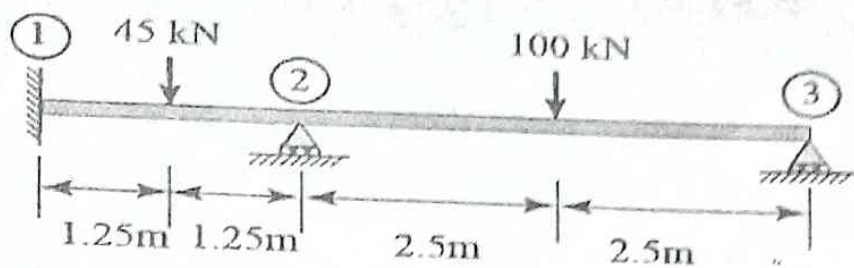
Q3. How would you prove that for a two span continuous beam ABC having span AB = l_1 and BC= l_2 moment equation is given as

$$M_a l_1 + 2M_b(l_1 + l_2) + M_c l_2 = (6a_1 x_1)/l_1 + (6a_2 x_2)/l_2$$
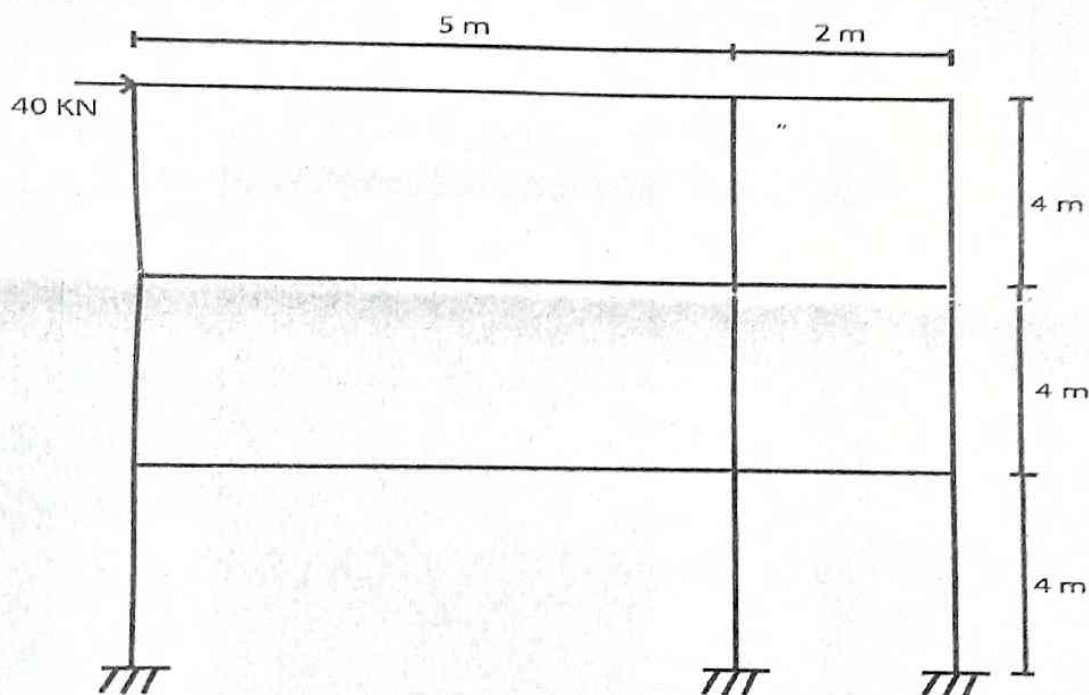
Where a_1 and a_2 are the areas and x_1 and x_2 are the centroidal distances of the free B.M.D.

CO2

OR

Analyse the given frame by using Cantilever method.

CO2

5 m   2 m

40 KN

4 m

4 m

4 m

Q.4 A continuous beam ABCD having spans AB, BC and CD of length 8m, 7m and 6m respectively. The beam is fixed at A and simply supported at D it carries a point load of 80KN at the mid span of AB, the span BC carries the UDL of 25KN/m and a point load of 40KN on the support D. determine the support moments using Rotation contribution method, if the support B sinks by 5mm.

Take $E = 2 \times 10^5 \, N/mm^2$ and $I = 100 \times 10^6 \, mm^4$ CO2

OR

Analyse the given frame by using Portal method.   CO2

50KN

50KN

25KN

a   b   c

e   f   g

2m

2m

4m   4m

i   j   k
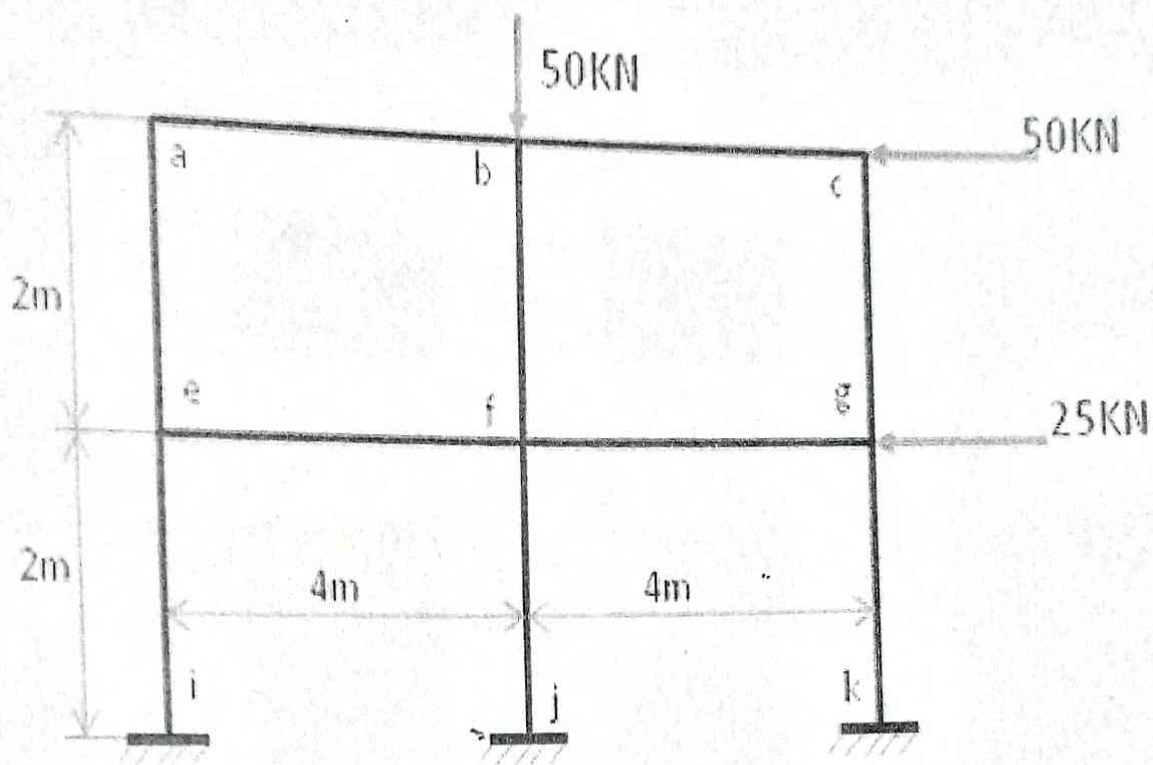
Q.5 A beam ABCD, 16m long is continuous over three spans: AB=8m, BC=6m, CD=6m, the support's being at the same level and simply supported. There is a UDL of 50KN/m over BC, there is a point load on AB of 100KN at 3m from A, on CD there is point load of 60KN at 2.5m from D. Calculate the moments and reaction at the supports and also draw the S.F.D and B.M.D, using three moments theorem.   CO3

OR

                                                          CO3
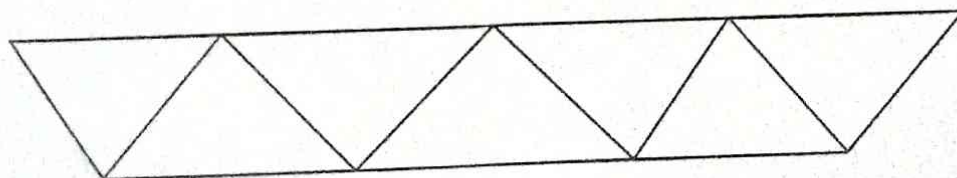
How are the slope deflection equations developed?.

Q.6 Three Wheel loads 100KN,80KN and 60KN spaced at 5m each roll on a span of 20m.find the greatest reactions at the supports and the absolute maximum B.M for the girder, using the influence lines.   CO4

OR

A warren girder having a span of 24 m consists of four equal panels shown in figure. Plot the influence line 'for force in all the members   CO4

All angels of 60⁰