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Roll No. | | | | | | | | | | |

B.E/ B.Tech DEGREE END SEMESTER EXAMINATIONS, APRIL/MAY 2019

CIVIL ENGINEERING

FIFTH SEMESTER

CE 8504 STRUCTURAL ANALYSIS - I (Regulation 2012)

Time: 3 Hours | Answer ALL Questions | Max. Marks 100

PART-A (10 x 2 = 20 Marks)

1. What is meant by "lack of fit"? How do you determine the deflection at a joint in a pin jointed truss due to lack of fit in certain members?
2. How do you determine the deformation at a point in a rigid jointed determinate plane frame due to the given loading?
3. Write the fixing moment induced in a fixed beam AB of span "L " when a concentrated clockwise moment "M" is acting at the mid span.
4. Draw the qualitative bending moment diagram for a single storied single bay portal frame with column bases fixed due to sway. Assume EI is same for all the members.
5. A continuous beam ABC (with uniform flexural rigidity EI) of length 10 m is simply supported at the ends A and C and continuous over the support B which is at 5 m from A. Using moment distribution method, determine the moment at the continuous support B, if it carries a uniformly distributed load 6kN/m throughout the length.
6. Specify any four reasons for a portal frame to sway.
7. Determine the degree of redundancy and identify the redundants for a propped cantilever with gravity loading and show the possible primary structures.
8. Generate the flexibility matrix for a cantilever beam element considering only the flexural deformations.
9. For what sort of structure, the stiffness matrix will be strictly diagonally dominant?
10. Generate the stiffness matrix for a simply supported beam element considering only the flexural deformations.

Part – B (5 x 16 = 80 marks)

(Question No.11 is Compulsory)

11. Determine the vertical displacement at D of the pin jointed plane frame shown in Fig.Q.11 . Take AE for all the members as 50 000 kN.

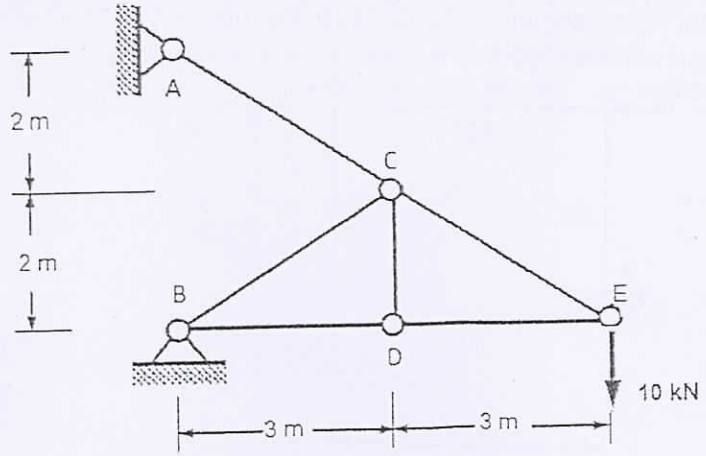


Fig.Q.11

12. a) Analyze the continuous beam shown in Fig.Q.12 (a) by slope deflection method and draw the shearing force and bending moment diagrams for the condition that the support B sinks by 10 mm under the loading. Consider EI is constant throughout and its value is 20 000 kNm^2.

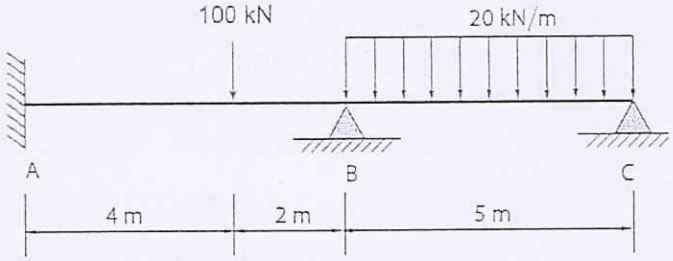


Fig.Q.12 (a)

(OR)

b) Analyse the portal frame shown in Fig.Q.12 (b) by slope deflection method and draw the bending moment diagram.

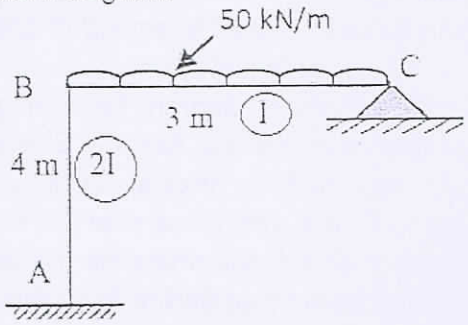
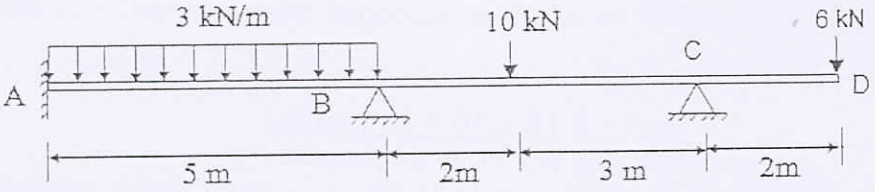


Fig.Q.12 (b)

13. a) Analyze the continuous beam shown in Fig, Q.13 (a) by moment distribution method and draw the shearing force and bending moment diagrams. Consider EI is constant throughout.



Fig, Q.13 (a)

(OR)

b) Analyse the portal frame shown in Fig.Q.13 (b) by moment distribution method and draw the bending moment diagram.

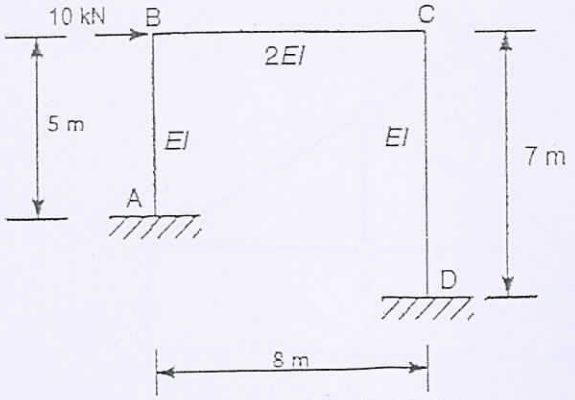


Fig.Q.13 (b)

14. a) Analyse the continuous beam shown in Fig.Q.14 (a) by flexibility method and draw the shearing force and bending moment diagrams giving critical values. Consider EI is constant throughout.

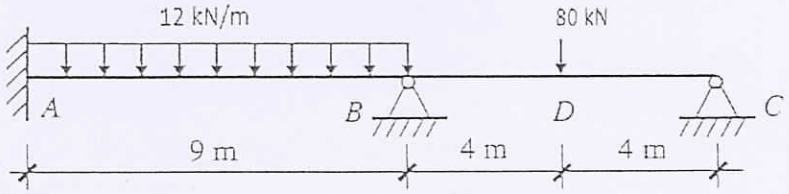


Fig.Q.14 (a)

(OR)

b) Analyze the portal frame shown in Fig.Q.14 (b) by flexibility method and draw the bending moment diagram.

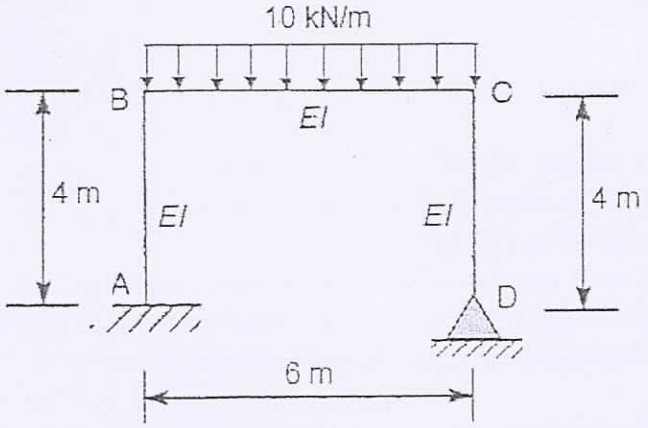


Fig.Q.14(b)

15. a) Using the stiffness method, analyse and draw the bending moment diagram for the continuous beam as shown in Fig.Q.15 (a),. Consider EI is constant throughout.

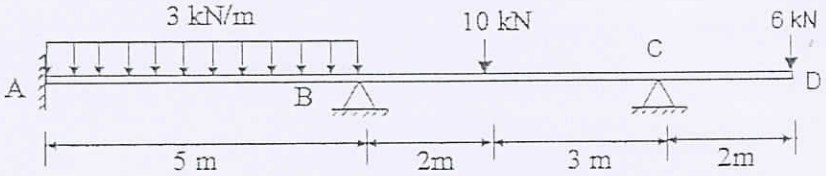


Fig.Q.15 (a)

(OR)

b) Analyse the pin jointed plane frame shown in Fig.Q.15 (b) by stiffness method.

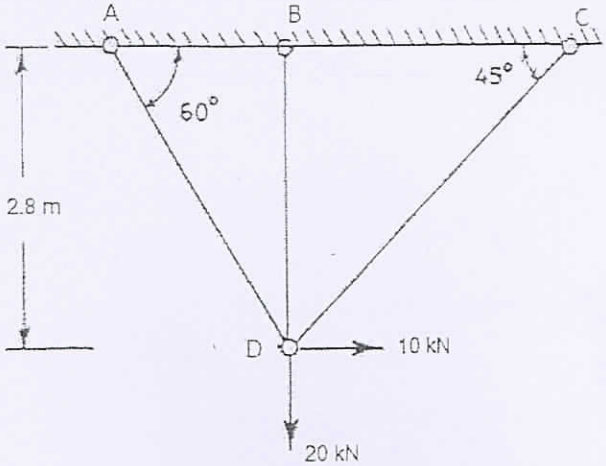


Fig.Q.15 (b)