

G.R. No.

paper code: U228-III (RE-FF)

MAY 2019/ENDSEM-REEXAM

S. Y. B. TECH. (CIVIL ENGINEERING) (SEMESTER - II)

COURSE NAME: THEORY OF STRUCTURES

COURSE CODE: CVUA22171

(PATTERN 2017)

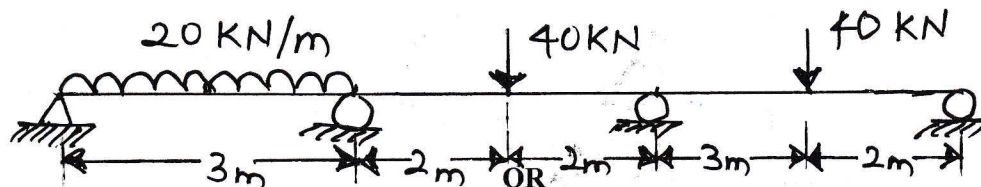
Time: [2 Hours]

[Max. Marks: 50]

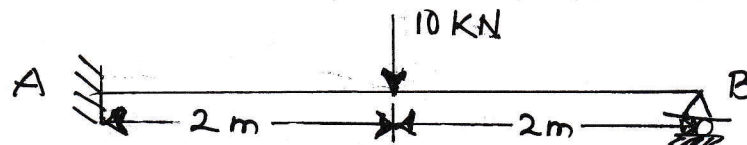
(*) Instructions to candidates:

- 1) Answer Q.1, Q.2, Q.3, Q.4, Q.5 OR Q.6, Q.7 OR Q.8
- 2) Figures to the right indicate full marks.
- 3) Use of scientific calculator is allowed
- 4) Use suitable data wherever required

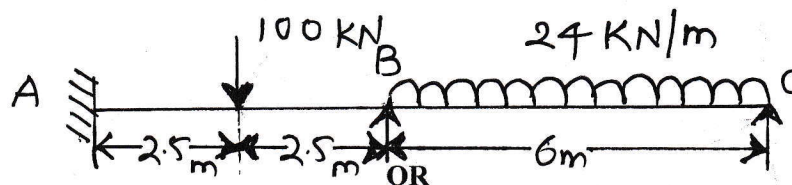
- Q.1) a) Calculate the support moments in the continuous beam loaded and supported as shown below using Three Moment Equations. [6]



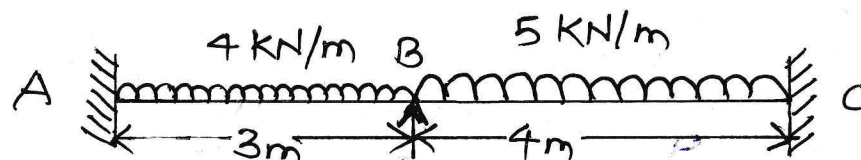
- b) Determine the support reactions for the cantilever beam as shown below using Strain Energy Method. [6]



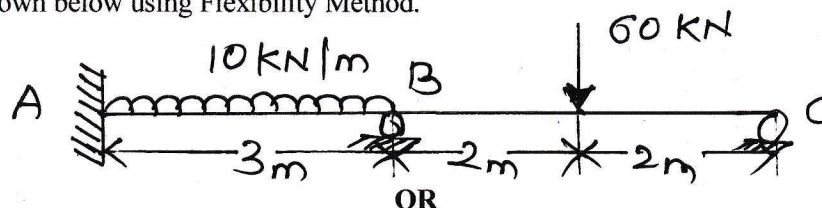
- Q.2) a) Calculate the support moments in the continuous beam loaded and supported as shown below using Slope Deflection Method. [6]



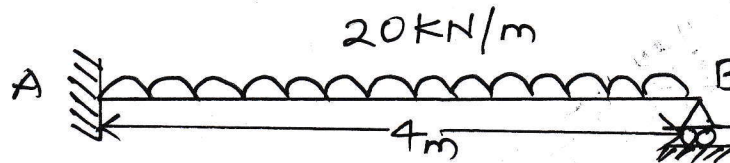
- b) Calculate the support moments in the continuous beam loaded and supported as shown below using Moment Distribution Method. [6]



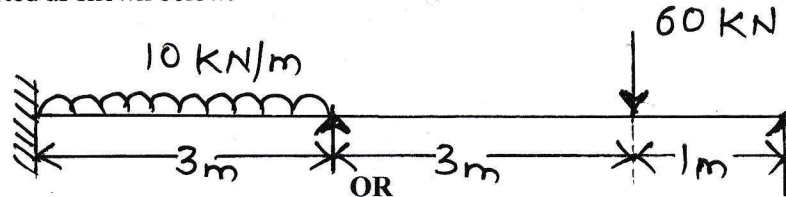
- Q.3) a) Calculate the support moments in the continuous beam loaded and supported as shown below using Flexibility Method. [6]



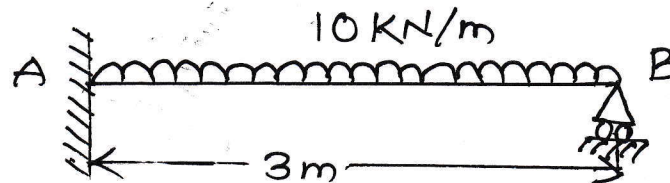
- b) Calculate the support moments in the continuous beam loaded and supported as shown below using Flexibility Method. Support B sinks by 10 mm. Assume $EI = 4000 \text{ KN-m}^2$ [6]



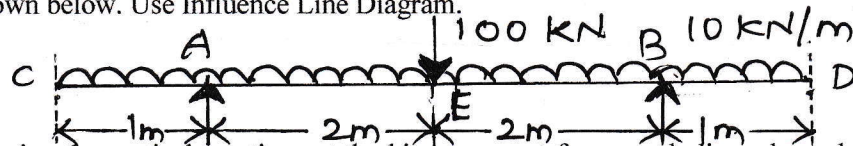
- Q.4) a) Compute the Fixed End Moments and derive stiffness matrix for the beam loaded and supported as shown below. [4]



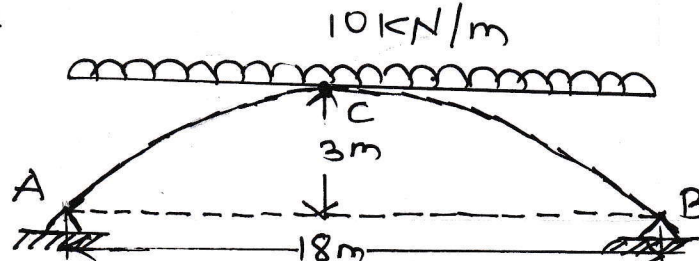
- b) Compute the Fixed End Moments and derive stiffness matrix for the beam loaded and supported as shown below. Support B sinks by 20 mm. $EI = 4000 \text{ KN-m}^2$ [4]



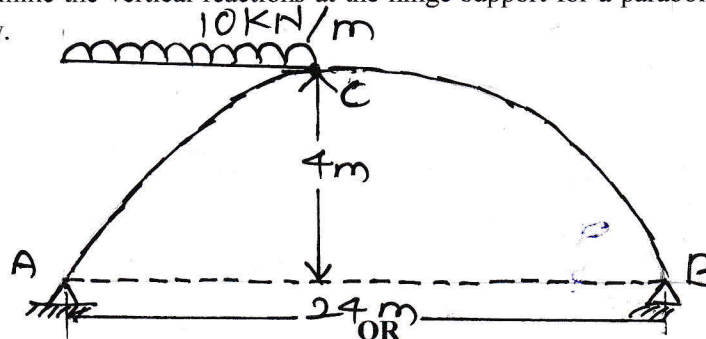
- Q.5) a) Calculate Shear Force and Bending Moment at E for the beam loaded and supported as shown below. Use Influence Line Diagram. [6]



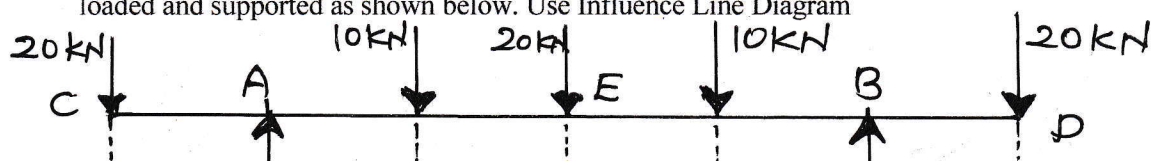
- b) Determine the vertical reactions at the hinge support for a parabolic arch as shown below. [4]



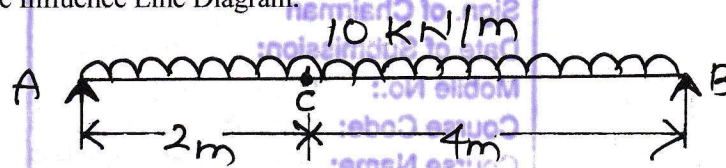
- c) Determine the vertical reactions at the hinge support for a parabolic arch as shown below. [4]



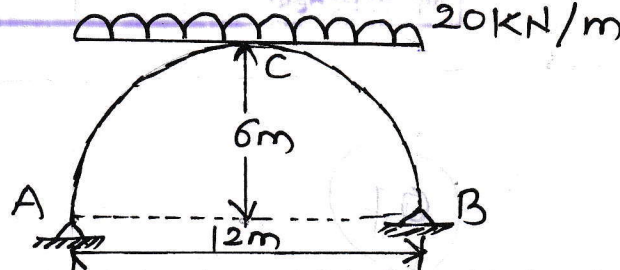
- Q.6) a) Determine the reactions at A, B, Shear Force and Bending Moment at E for the beam loaded and supported as shown below. Use Influence Line Diagram [6]



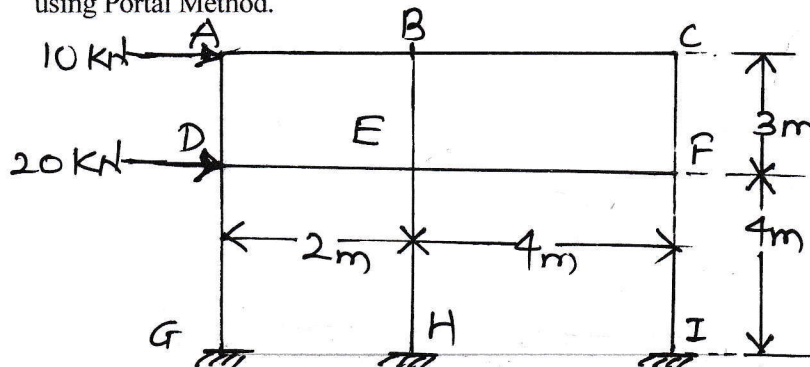
- b) Determine the Shear Force and Bending Moment at C for the beam loaded as shown [4]
below. Use Influence Line Diagram.



- c) Compute vertical reactions at A and B for the semi-circular arch loaded as shown. [4]



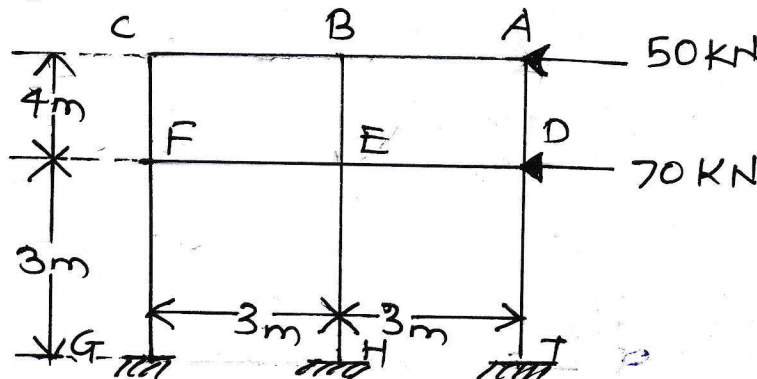
- Q.7) a) Compute the Shear Force in the columns of all the floors of the frame loaded as shown [6]
using Portal Method.



- b) Compute the axial and shear force in the beam AB and column AD for the frame of [4]
Q7 a.
c) Compute the axial and shear force in the beam BC and column BE for the frame of [4]
Q7 a.

OR

- Q.8) a) Compute the Axial Force in the columns of all the floors of the frame loaded as shown [6]
using Cantilever Method.



- b) Compute the axial and shear force in the beam AB and column AD for the frame of [4]
Q8 a.
c) Compute the axial and shear force in the beam BC and column BE for the frame of [4]
Q8 a.