Total No. of Questions – [08]   Total No. of Printed Pages 03

G.R. No.

Paper Code: U228-111 (RE-FS)

MAY 2019/ENDSEM RE-EXAM

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

COURSE NAME: THEORY OF STRUCTURES

COURSE CODE: CVUA2217

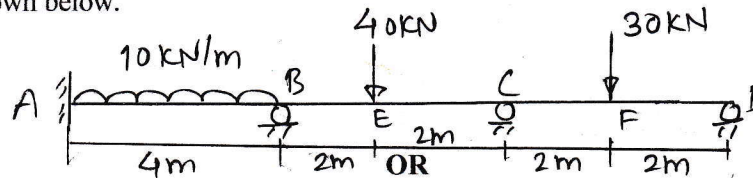**(PATTERN 2017)**

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 whereever required

Q.1) a) Write the three moment equations for the continuous beam loaded and supported as   [6]
   shown below.

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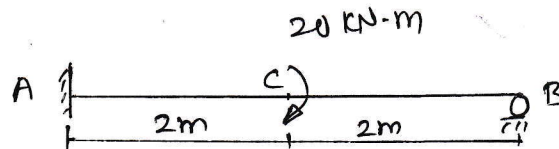

Q.2) a) Calculate the support moments in the continuous beam loaded and supported as   [6]
          shown below using Slope Deflection Method.

                                           OR
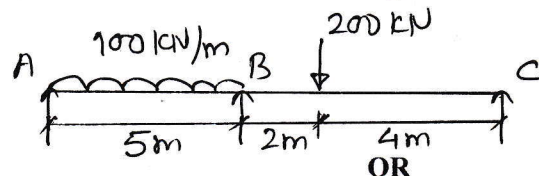
       b) Calculate the support moments in the continuous beam loaded and supported as   [6]
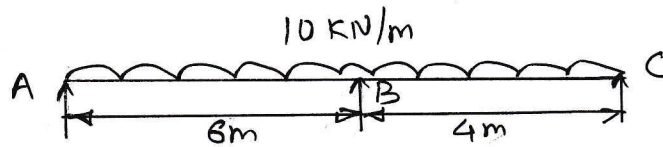   shown below using Moment Distribution Method.
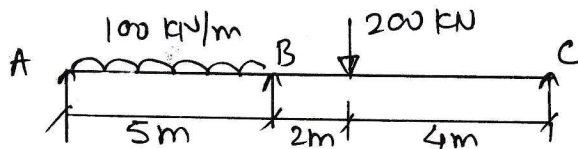
Q.3) a) Determine the support moments for the frame loaded and supported as shown using   [6]
          Flexibility Method.
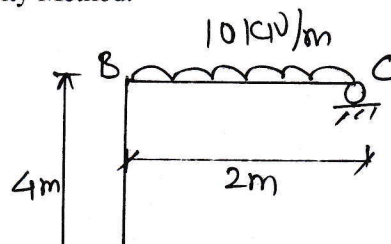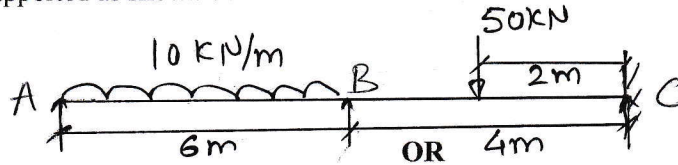
OR

b) Determine the support moments for the beam loaded and supported as shown using [6] Flexibility Method.

$10 \text{ KN}/\text{m}$

A ▵ ——————————— ▵ C
  ↑B
  |◄——6m——►|◄——4m——►|

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

50KN

$10 \text{ KN}/\text{m}$

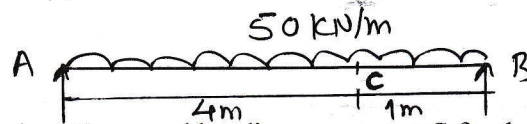A ————————— B ——————— C
              2m
  |◄——6m——►| 4m

OR

b) Compute the Fixed End Moments and derive stiffness matrix for the frame loaded and [4] supported as shown below.

100 KN → B 60 KN ↓   C
                    D

A
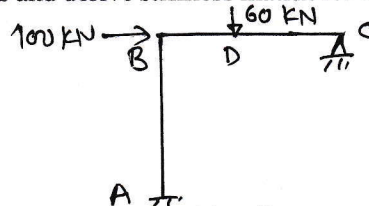
$AB = 3m$
$BD = 2m$
$CD = 2m$

Q.5) a) Calculate reactions at supports and shear Force and bending moment at C for the beam [6] loaded and supported as shown below. Use Influence Line Diagram.

$50 \text{ KN}/\text{m}$

A ——————————— B
        C
  |◄——4m——►|◄1m►|

b) Calculate shear Force and bending moment at C for the beam loaded and supported [4] as shown below. Use Influence Line Diagram.

100 KN ↓

A ——————————— B
   C
  |◄——3m——►|◄——3m——►|
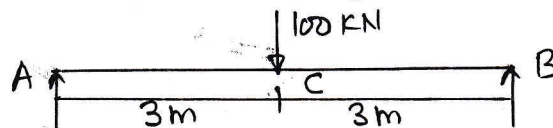
c) Draw typical Influence Line Diagrams for the support reactions, shear force and [4] bending moment at any section C for a simply supported beam of span L.

OR

Q.6) a) Determine the reactions at hinge support and bending moment at D for the semi- [6] circular arch loaded as shown.
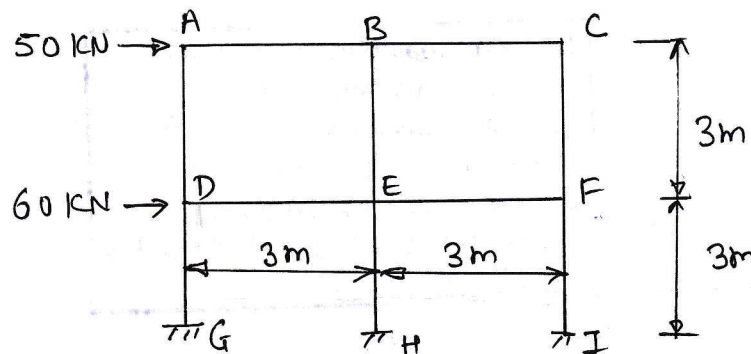
$50 \text{ KN}/\text{m}$ C

D

6m

A   1m   - - - - - - - B
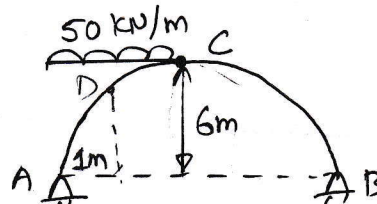
b) Determine the reactions at hinged support for the parabolic arch as shown below. [4]

$10 \text{ KN}/\text{m}$

C   3m   D

A - - - - - - - - B

|◄——12m——►|◄—6m—►|
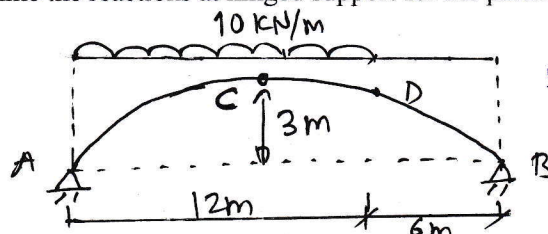
c) Write the equation of parabolic arch assuming left support as origin and crown as the [4] origin.

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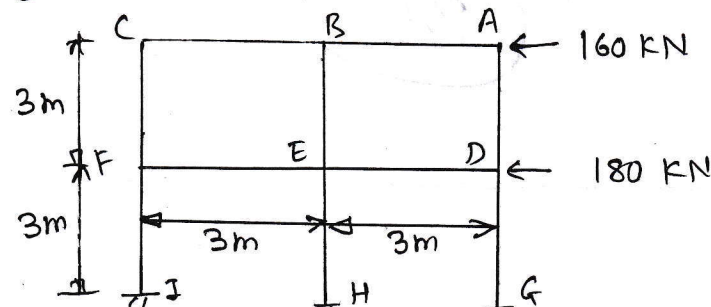
b) Compute the axial and shear force in the beam AB and column AD for the frame of   **[4]**
Q8 a.

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