0605M142   Candidate's Seat No :_____

B.Arch. (Sem.-III) Examination
AR 303 (2015)
Structures-III

Time : 2 Hours]   May-2017   [Max. Marks : 50

Instruction: 1. Assume suitable data if necessary.
2. Figures to the right indicate full marks.
3. Use of non-programmable calculator.

Q-1   Answer the followings.

(a) Explain distribution factor, relative stiffness in moment distribution method. (05)

(b) Write advantages and disadvantages of fixed beam over a simply supported beam. (05)

(c) Explain clapeyron's theorem with neat sketch. (05)

Q-2   Derive fixed end moment of beam having single span L, when subjected (07)
to (A) point load at centre,
(B) U. D. L. at full span.
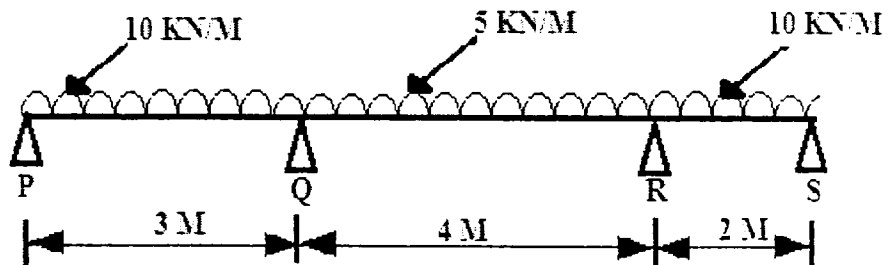
Q-3   Solve by clapeyron's theorem and draw bending moment diagram. (10)
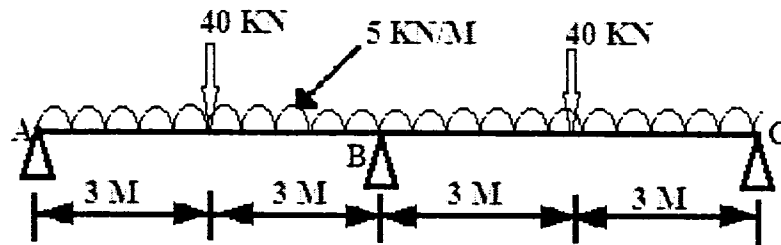
OR   **OR**

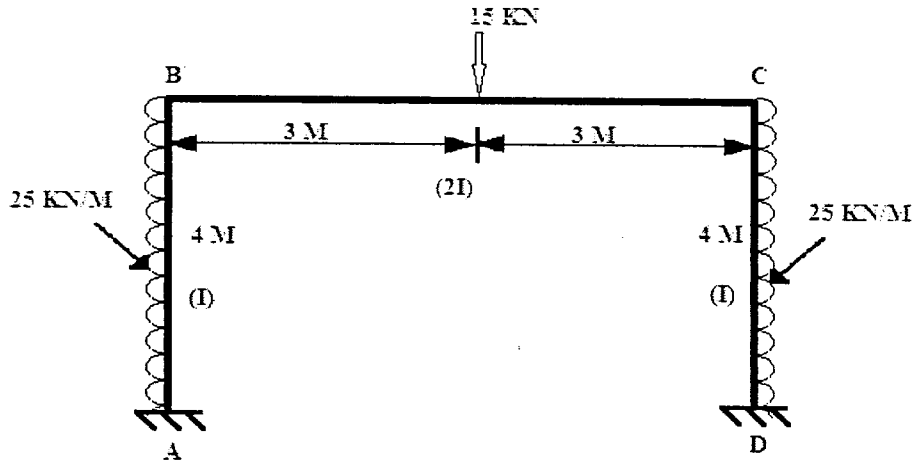Q-3   Solve by clapeyron's theorem and draw bending moment diagram. (10)

Page 1 of 2

Q-4   Solve this example by moment distribution method and draw bending   (10)
       moment diagram.

10 KN/M

30 KN

A   3 M   B   2 M   2 M   C

OR   **OR**

Q-4   Solve this example by moment distribution method and draw bending   (10)
       moment diagram.

15 KN

B   3 M   (2I)   3 M   C

25 KN/M   25 KN/M

4 M   4 M

(I)   (I)

A   D
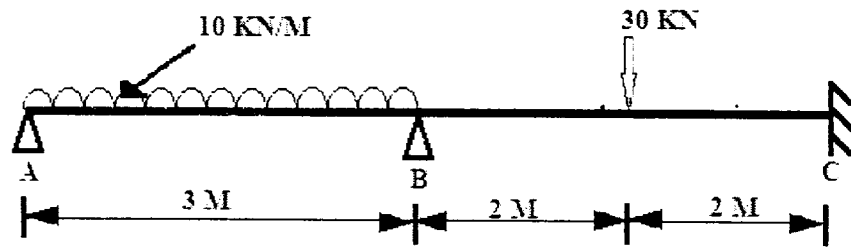
Q-5   Find the horizontal thrust at each end for the given three hinge arch and   (08)
       moment at 5M from right end.

15 M   5M   5M   5M

60 KN/M   C   70 KN   50KN

5 M

A   B

30 M
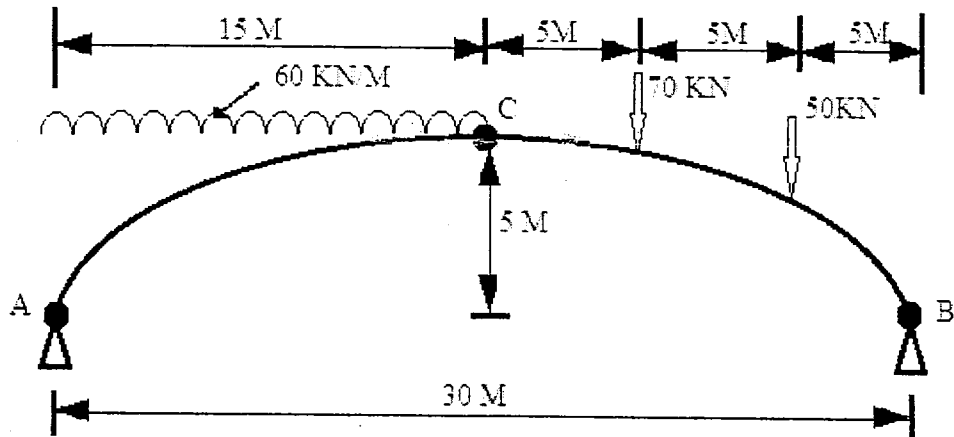
OR   **OR**
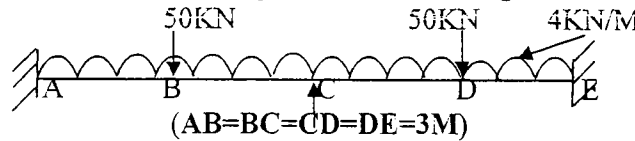
Q-5   Answer the following
       (a) Differentiate between truss and frame.   (04)
       (b) Explain types of trusses with neat sketch.   (04)

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NOTE : SCIENTIFIC CALCULATOR IS PERMITTED BUT NOT PROGRAMMABLE .

Q.1 a) Write advantages and disadvantages of fixed beam over a simply supported beam   01

   b) Derive an equation of fixed end moment of beam having single span L, when subjected   03
       to (A) Point load at center (B) U.D.L

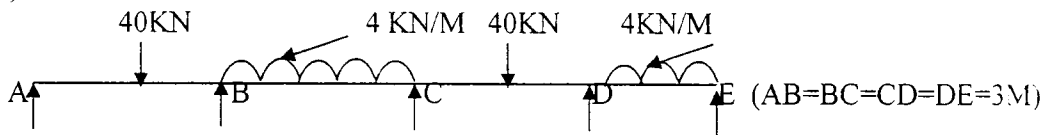   c) Find fixed end moment and draw bending moment diagram   06

   3KN/M   50 KN   50KN   50KN

   A 2M B 2M C 2M D 2M E
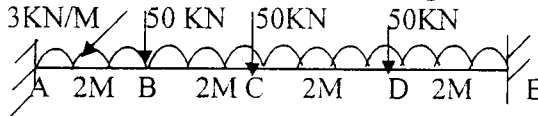
Q.2 a) Write an equation for clapyron's theorem and explain in detail.   02

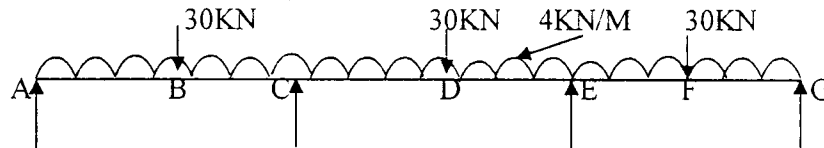   b) Solve by three moment principle and draw bending moment diagram.   08

   50KN   50KN   4KN/M

   A   B   C   D   E

   (AB=BC=CD=DE=3M)

   OR

   (b)

   40KN   4 KN/M 40KN   4KN/M   08

   A   B   C   D   E (AB=BC=CD=DE=3M)

Q.3 a) Solve by moment distribution method and draw bending moment diagram   08
       (AB=BC=CD=DE=EF=FG=3M)

   30KN   30KN   4KN/M   30KN

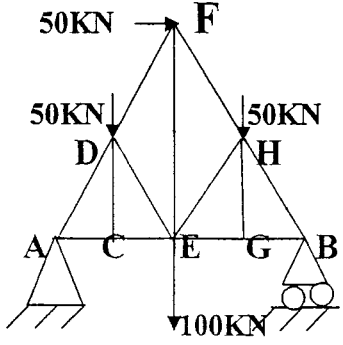   A   B   C   D   E   F   G

   OR

   a)   Analyze the portal frame and draw bending moment diagram

   AC, BD=2I,CD=I CE=ED=2M,AC=BD= 5M   08

   90KN

   C   E   D

   7KN/M   7KN/M

   A   B
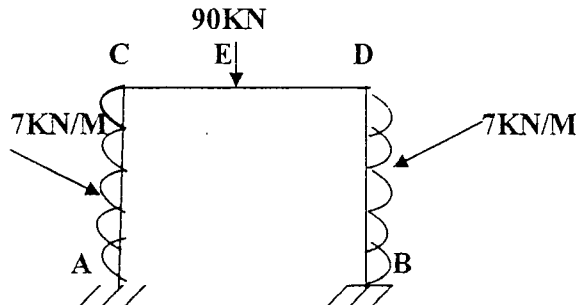
   b) Explain Relative stiffness, Distribution factor and Carry over.   02

Q.4   a) Explain zero force in the members of the truss.   01
       b) Find forces in All member by method of joints or section.   07

50KN → F

50KN↓   ↓50KN
D   H

A   C   E   G   B

↓100KN

AC=CE=EG=GB=2M, AB=8M, FE=2M.

       c) Write advantages and disadvantages of fixed beam over a simply supported beam.   02

Q.5   a) The sectional requirement for an arch is less than that of a beam of the same span and   03
          carrying the same load system"----Prove it by suitable example.

       b) Find the horizontal thrust at each end and maximum bending moment for the given arch.   07

60Kn/m   90Kn
          ↓   80kN

4M |4m

4M(rise)

24M
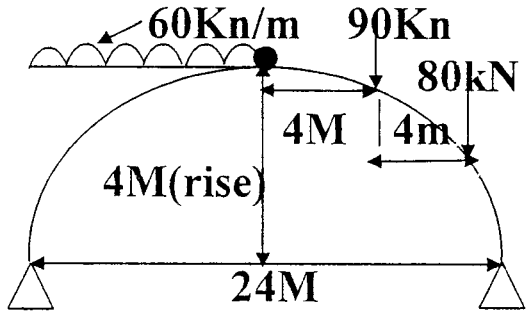
OR

       b) A semicircle three hinge arch, having radius is R, is subjected to U.D.L.
          of W KN/M throughout the span. find maximum B.M.   07