Enrollment No: _____ **Exam Seat No:**_____

C.U.SHAH UNIVERSITY

Winter Examination-2015

Subject Name: Structural Analysis - II
Subject Code: 4TE04STA1 **Branch: B.Tech(Civil)**
Semester: 4 **Date :12/05/2016** **Time: 02:30 To 05:30** **Marks :70**

Instructions:

(1) Use of Programmable calculator & any other electronic instrument is prohibited.
(2) Instructions written on main answer book are strictly to be obeyed.
(3) Draw neat diagrams and figures (if necessary) at right places.
(4) Assume suitable data if needed.

Q-1 **Attempt the following questions:** **(14)**

a) State the Eddy's theorem. 1

b) Explain carryover factor. 1

c) The distribution factor for member OB shown in Figure-1. 1

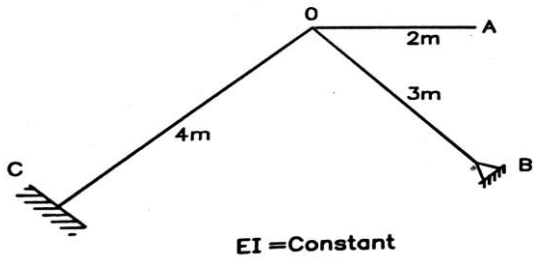

Figure 1

d) Find SI of the Given Structure in Figure-2. 1

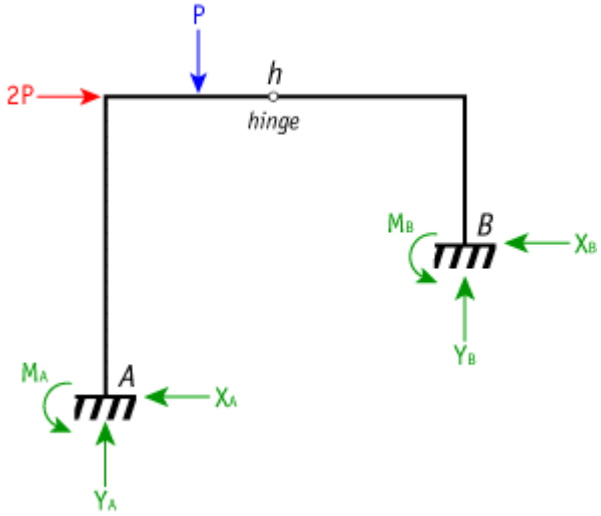

Figure-2

e) Find KI of the above structure in Q-1 (d) (Figure-2). 1

f) Show the number of Possible Displacement in Figure-2 Q-1 (d). 1

g) Define Stiffness. 1

h) Moment distribution method is an iterative method or an exact method? 1

i) Three hinge arch is generally hinged at its support and_____ 1

j) Give the formula for deflection at point C in given figure-3. (EI constant) 1

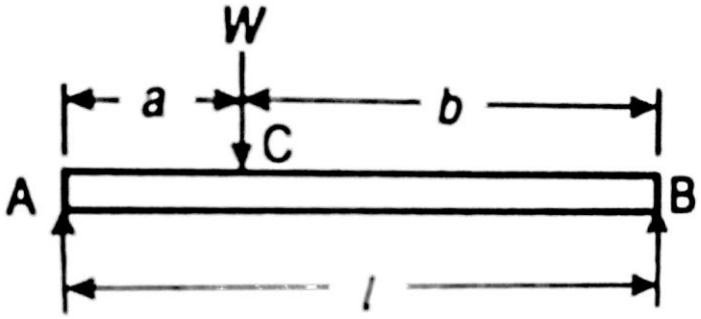

Figure-3

k) The product of Yong's modulus (E) and moment of inertia (I) is known as_____ 1

l) State the principle of superposition. 1

m Draw linear arch. 1

n) Write fixed end moment at B in Given Figure-4. 1

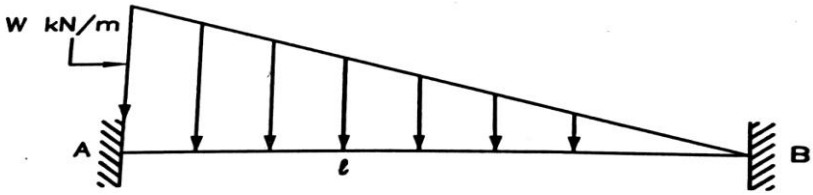

Figure-4

Attempt any four questions from Q-2 to Q-8

Q-2 **Attempt all questions** **(14)**

(a) A continuous beam ABCD 12 m long is fixed at A and D, and is loaded as shown in Figure-5. Analyse the beam completely if the following movements take place simultaneously: **14**

(i) end A yields, turning through 1/250 radians in a clockwise direction.

(ii) end B sinks 30mm in downward direction

(iii) end C sinks 20 mm in down ward direction.

The beam has constant I = 38.20×10^5 mm^4 and E = 2×10^5 N/mm^2.

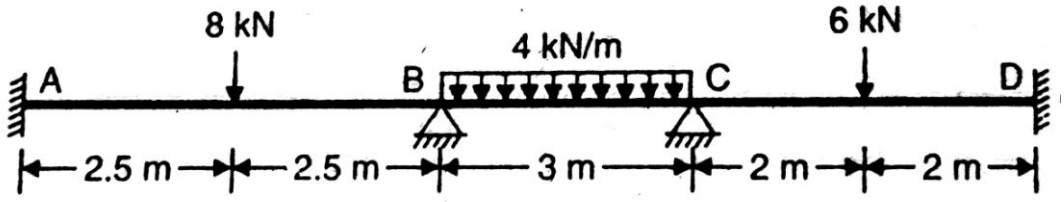

Figure-5

Q-3 **Attempt all questions** **(14)**

(a) Analyse the beam shown in Figure-6 using flexibility method. Chose R_B as redundant. Draw BM diagram. **10**

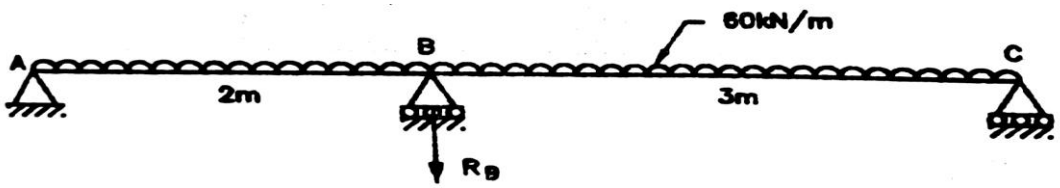

Figure-6

(b) "Indeterminate structure are better than determinate structures" Explain with suitable example. **4**

Q-4 **Attempt all questions** **(14)**

(a) Analyse the beam shown in Figure-7 by moment distribution method. **08**

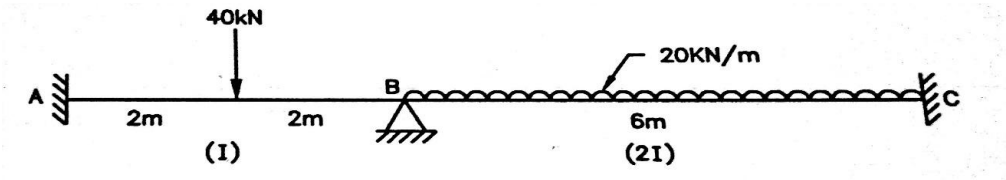

Figure-7

(b) Give the following difference: **06**

(a) Truss and Frame

(b) SI and KI

Q-5 **Attempt all questions** **(14)**

(a) A three hinge parabolic arch of 20m span and 4m central rise caries a point load of 4 kN at 4m horizontally from the left hand hinge. Calculate the normal thrust and shear force at the section under the load. Also calculate the maximum B.M positive and negative. **06**

(b) Determine reaction at prop for a propped cantilever beam using Castiglione's second theorem as shown in Figure-8 also draw S.F and B.M. **08**

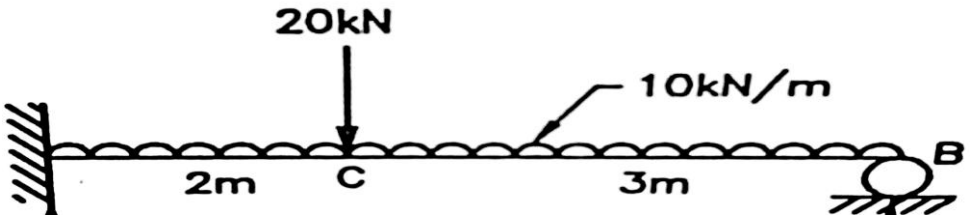

Figure-8

Q-6 **Attempt all questions** **(14)**

(a) Make neat diagrams of the influence lines for shearing force and B.M at a section 3 m from one end of a simply supported beam, 12 m long. Use the diagrams to calculate the maximum shearing force and the maximum bending moment at this section due to a uniformly distributed rolling load. 5 m long of 2 kN per meter intensity. **7**

(b) Analyse the beam given in Figure-9 by moment Distribution method.

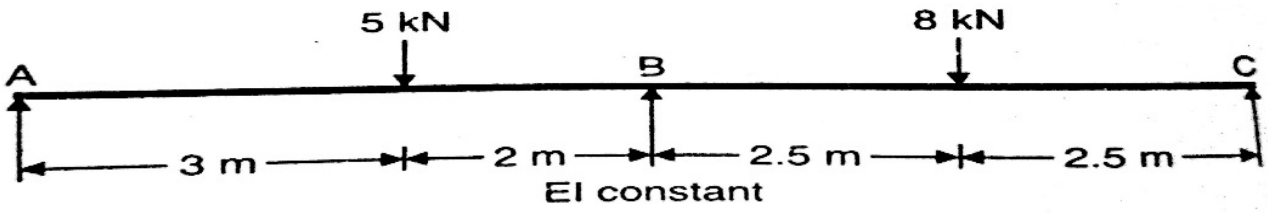

Figure-9

Q-7 **Attempt all questions** **(14)**

(a) Determine deflection at B and slope at C for a cantilever beam shown in Figure-10 by unit load method. EI = 10×10^4 KN.m^2. **10**

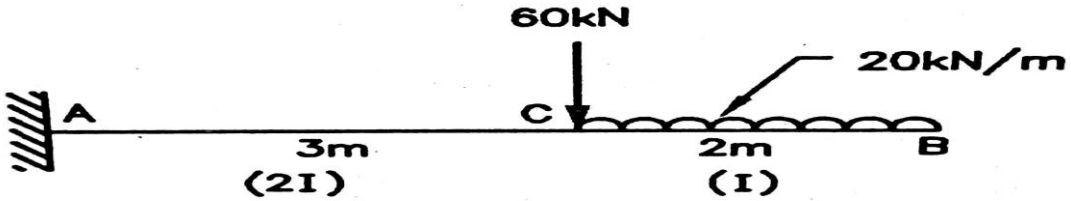

Figure-10

(b) Discuss influence line and its important in line diagram. **4**

Q-8 **Attempt all questions** **(14)**

(a) A continuous beam ABC is supported on an elastic column BD and is loaded as shown in Figure-11 Treating joint B as rigid, analyse the frame and plot the BM diagram and deflected shape of the structure. **14**

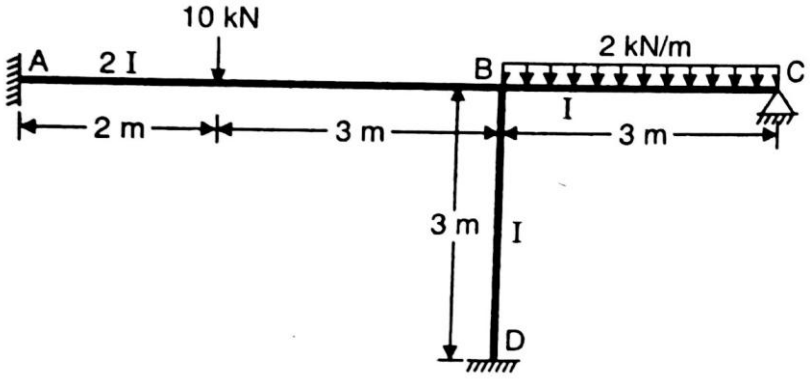

Figure-11