

Enrollment No: _____

Exam Seat No: _____

C.U.SHAH UNIVERSITY

Summer Examination-2017

Subject Name : Structural Analysis - II

Subject Code : 4TE04STA1

Branch: B.Tech (Civil)

Semester : 4

Date :08/05/2017

Time : 02:00 To 05:00

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) Write equation for strain energy due to axial loading. (1)
- b) Define strain energy (1)
- c) Write full form of SI. (1)
- d) Write equation for strain energy due to bending. (1)
- e) Define Castigliano's second theorem. (1)
- f) Write equation for find out degree of internal indeterminacy (1)
- g) What is the fixed end moment When both fixed and whole beam loaded with U.D.L load? (1)
- h) Find static indeterminacy for following beam. (1)

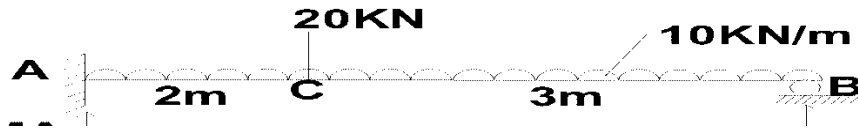


- i) What is stiffness? (1)
- j) Define carry over moment (1)
- k) What is Distribution Factors? (1)
- l) Enlist various types of skeletal structures. (1)
- m) Write full form of KI. (1)
- n) Define carry over factors. (1)

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

- (a) Determine reaction at prop for a propped cantilever beam using Castiglione's second theorem as shown in figure below. (7)

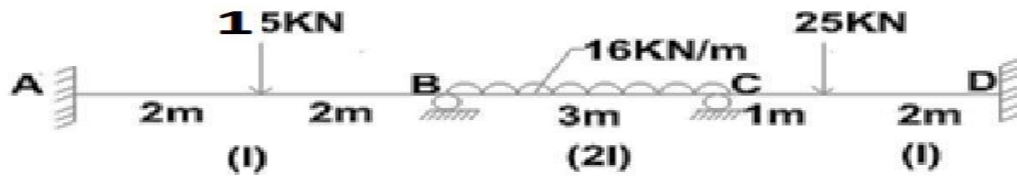




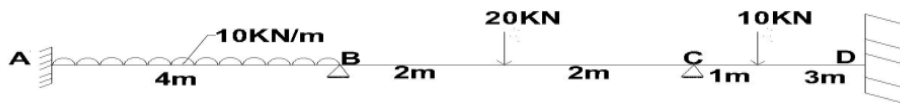
(b) Explain Castigliano's second theorem in detail (7)

Q-3 Attempt all questions (14)

(a) Draw B.M diagram for a beam shown in figure below using slope deflection method. (7)

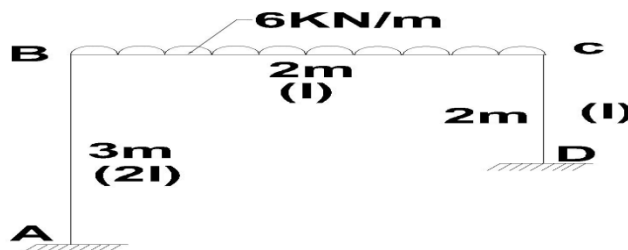


(b) Analyze the continuous beam shown in figure by slope deflection method. Support B sinks 5 mm and support C sinks by 2 mm. Draw B,M diagram. Take $E = 2 \times 10^5 \text{ N/mm}^2$ and $I = 16 \times 10^6 \text{ mm}^4$ (7)



Q-4 Attempt all questions (7)

(a) Analyse the portal frame ABCD shown in figure and draw BM diagram. Also draw deflected shape of the frame. (7)

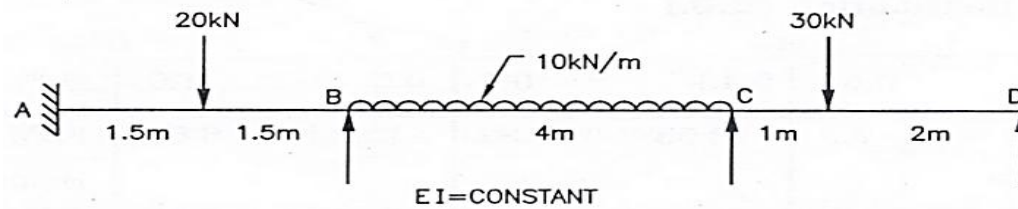


(b) Write the step by step procedure for moment distribution method. (7)

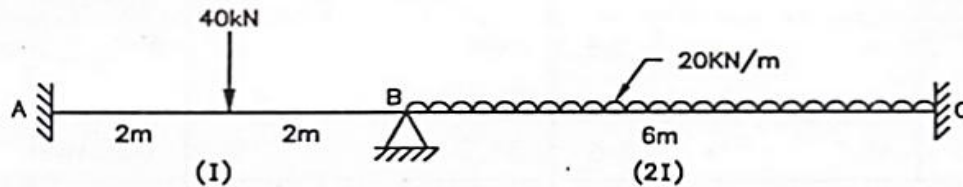
Q-5 Attempt all questions (14)

(a) Analysis the beam shown in figure by moment distribution method and draw B.M. and S.F. diagram. (7)





- (b) Analyse the beam shown in figure by moment distribution method and draw bending moment diagram. (7)

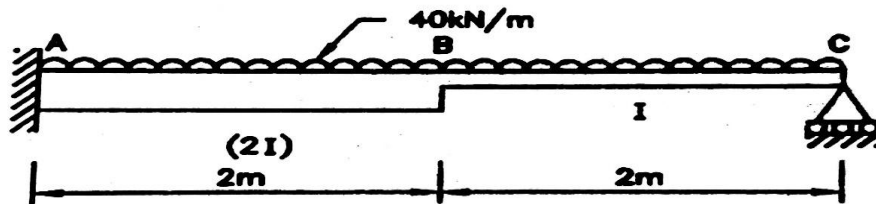


Q-6 Attempt all questions (14)

- (a) Explain Muller Breslau principle (7)
 (b) Derive the formula $[Q] = -[F]^{-1} [DQL]$ for flexibility method. (7)
 (14)

Q-7 Attempt all questions

- (a) Analyze the propped cantilever beam shown in fig by flexibility method. (7)



- (b) A three hinge parabolic arch, hinged at the crown and springing has a horizontal span of 12 meters and a central rise of 2.50m. it carries a uniformly distributed load of 30 kN per horizontal metre run over the left hand half of the span. Calculate the reactions at the end hinges. Also calculate the values of the normal thrust, shear force and bending moment at 3.0m, 7.5 m, from the left hand hinge. (7)

Q-8 Attempt all questions (14)

- (a) A three hinged parabolic arch, hinged at the crown and springing, has a horizontal span of 15 metres with a central rise of 3 meters. It carries a uniformly distributed load of 40 kN per horizontal metre of span over the left hand half of the span. Calculate the normal thrust, radial shear and bending moment at 5 metres from the left hinge. (7)
 (b) Draw B.M diagram for a beam shown in figure using Moment Distribution method. (7)

