

[Total No. of Questions - 9] [Total No. of Printed Pages - 4]
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B. Tech 5th Semester Examination

Structural Analysis-II (OS)

CE-5001

Time : 3 Hours

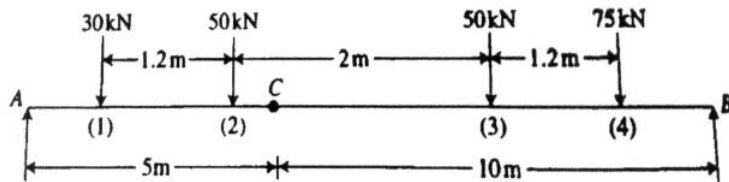
Max. Marks : 100

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Attempt five questions in all selecting one question from section A, B, C, D and all the subparts of section E

SECTION - A

- Determine the maximum SF and BM at a section X of 3.5 m from left support when a UDL of 15 kN/m for a length of 4 m traverses the girder of span 20 m. Also indicate the sections that experience the absolute maximum SF and BM. (20)
- A simple beam of span 15 m with a series of loads as shown in fig. Determine the absolute maximum moment using the influence line. Draw ILD. (20)



SECTION - B

- (a) Explain the term elastic Centre and its significance in the analysis of fixed arches. (8)

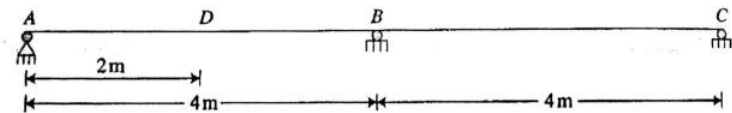
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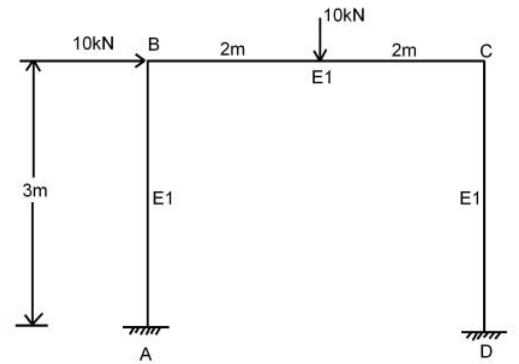
- (b) Locate the elastic centre of an unsymmetrical parabolic arch of span L with support A at a distance L_1 to the left of the crown and support B at a distance L_2 to the right of crown. (12)

- Construct the influence line for shear at point D which is the mid span of member AB shown in figure. Compute the value of maximum shear at D if the beam carries a UDL of 10 kN/m and the UDL can occupy a single span fully or apportion of a span. Assume EI is constant. (20)



SECTION - C

- Analyze the rigid frame as shown in Fig. Assume EI to be constant for all members. Draw bending moment diagram (20)

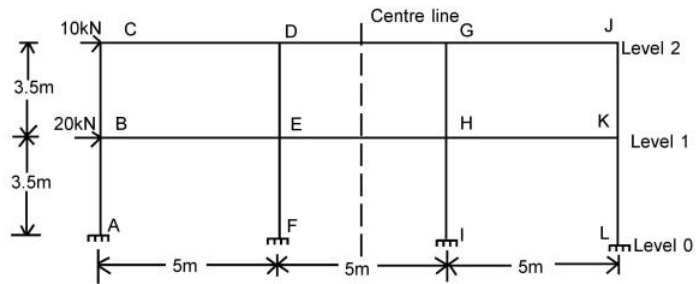


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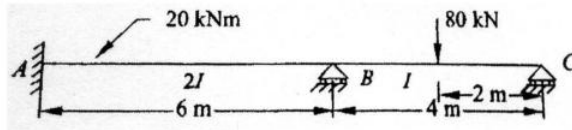
6. Analyze the building frame as shown in figure by cantilever method when the frame is subjected to horizontal loading.



(20)

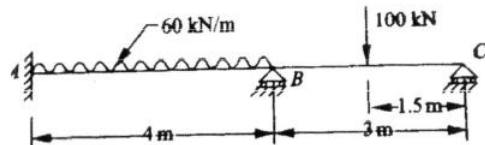
SECTION - D

7. Analyze the continuous beam by flexibility matrix method.



(20)

8. Analyze the continuous beam by stiffness matrix method. Take $E = 2 \times 10^5 \text{ N/mm}^2$ and $I = 5 \times 10^6 \text{ mm}^4$.



(20)

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SECTION - E

9. (a) List the advantage of stiffness matrix
 (b) What is the principle of influence line?
 (c) Define focal length.
 (d) State the muller Breslau's principal.
 (e) Construct influence line for reaction of left support A, shear and BM at section X of simple beam.
 (f) What is difference between portal and cantilever method?
 (g) What is the behavior of rigid frame under gravity load?
 (h) Define rotation factor and displacement factor.
 (i) Differentiate between stiffness and flexibility method.
 (j) What do you mean by absolute maximum moment?

(10×2=20)