



III B.Tech I Sem Supply End Examination, December 2022

Structural Analysis - II

(CIVIL)

Time: 3 Hours.**Max. Marks: 70**

Note: 1. Question paper consists: Part-A and Part-B.

2. In Part - A, answer all questions which carries 20 marks.

3. In Part - B, answer any one question from each unit.

Each question carries 10 marks and may have a, b as sub questions.

PART- A**(10*2 Marks = 20 Marks)**

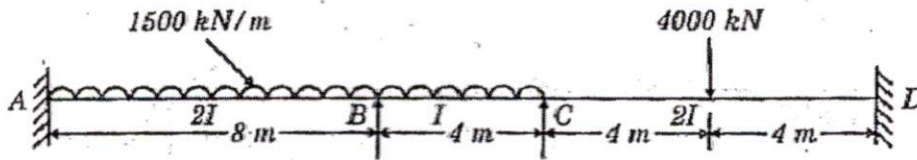
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|-------|---|----|-----|----|
| 1. a) | What are the different types of arches in terms of their determinacy? | 2M | CO1 | R |
| b) | Summarize the assumptions made in moment distribution method? | 2M | CO1 | U |
| c) | What are sign conventions used in Kani's Method? | 2M | CO2 | R |
| d) | A light suspension bridge is constructed to carry a pathway 3m broad over a channel 21m wide. The pathway is supported by six equidistant suspension rods. The cable has central dip of 2.0m. The total load on the platform is 10 kN/m ² . Find the maximum tension in the cable. | 2M | CO2 | An |
| e) | For quick solution, what are the approximate methods used for analysing the frames? | 2M | CO3 | R |
| f) | In Portal frame method, What are the assumptions considered during analysis? | 2M | CO3 | U |
| g) | What are the different approaches in solving Matrix methods? | 2M | CO4 | U |
| h) | What do you understand by degree of static and kinematic indeterminacy? | 2M | CO4 | U |
| i) | Write down basic procedure in developing influence lines of indeterminate structures? | 2M | CO5 | U |
| j) | Elucidate the usefulness of Muller-Breslau Principle | 2M | CO5 | U |

PART- B**(10*5 Marks = 50 Marks)**

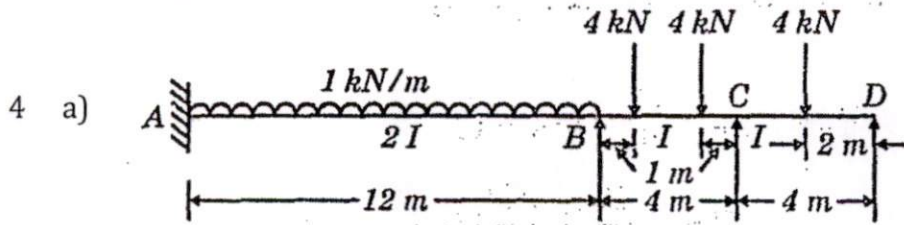
- 2 a) Simplify the horizontal thrust of two hinged arch when
- | | | | | |
|-----|---------------------------------------|-----|-----|----|
| i) | Subjected to UDL over the entire span | 10M | CO1 | An |
| ii) | Carrying point load at the crown | | | |

OR

- 3 b) Analyze a continuous beam ABCD which is loaded as shown in figure. During loading support B sinks by 1cm. Determine the support moments, $I = 1600 \text{ cm}^4$, $E = 2 \times 10^5 \text{ N/mm}^2$
- | | | |
|-----|-----|----|
| 10M | CO1 | An |
|-----|-----|----|



Analyze the continuous beam in figure by Kani's Method



10M CO2 An

OR

5 a) The cables of a suspension bridge have a span of 80 m and a central dip of 10 m. each cable is stiffened by a girder hinged at the ends and at mid span to constrain the cable to retain its parabolic shape. There is uniformly distributed load of 10 kN/m of span over the whole of the span and in addition a live load of 30 kN per horizontal meter and 20m long.

10M CO2 An

Determine the maximum tension in the cable when live load is situated on the left hand half of the stiffened girder with its right hand end over the central hinge. Sketch the S.F. and B.M. diagrams for the girder. Also find maximum B.M. and S.F.

Analyze the intermediate of a multistory frame shown in Figure.

Given spacing of frames = 3.6 m

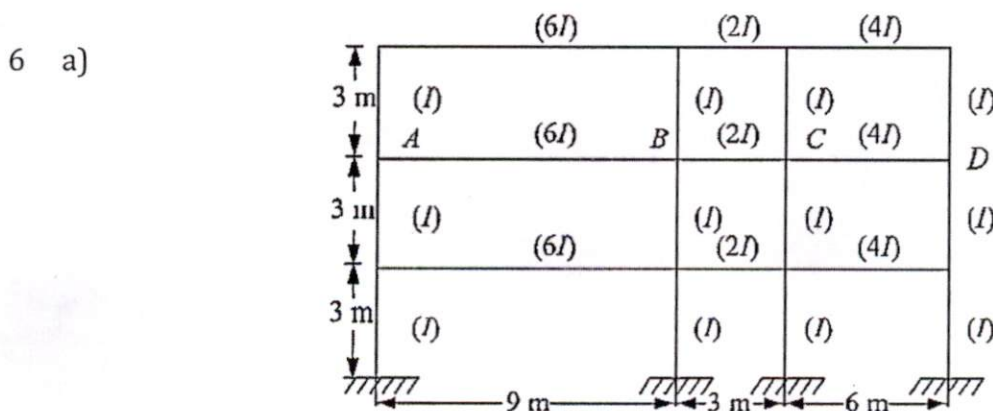
DL on floors = 4 kN/m²

LL on floors = 3 kN/m²

Self-weight of beams = 5 kN/m for beams of span 9 m

= 4 kN/m for beams of span 6 m

= 3 kN/m for beams of span 3 m



10M CO3 An

OR

7 a) In the frame shown in figure, wind loads transferred to joints 'A', 'D' and 'G' are 12 kN, 24 kN and 24 kN respectively. Analyze the frame by Cantilever method?

10M CO3 An

