

DEPARTMENT OF CIVIL ENGINEERING, I I T MADRAS

CE 3310: ADVANCED STRUCTURAL ANALYSIS

Class: 2/4 B Tech (Civil)

QUIZ 1

September 9, 2011

Maximum Marks: 15

'F' Slot

Time Limit: 50 minutes

Answer all questions.

1. **Find the force**, in terms of the load W , **transmitted at the centre E to beam CD** in the symmetrical grid arrangement shown in Fig. 1. The two horizontal beams AB and CD, both having the flexural rigidity EI , are simply supported and interconnected at E. (4)
2. For the frame in Fig. 2, **sketch the deflected shape**, and using by any method of your choice, analyse the frame and **draw the bending moment diagram**. (4)

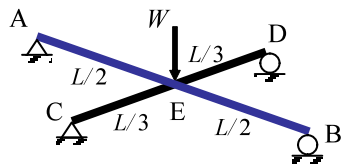


Fig. 1

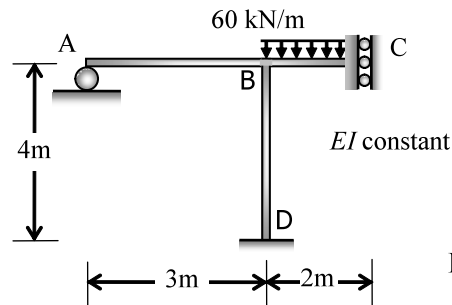


Fig. 2

3. Analyse the continuous beam shown in Fig. 3 by any method of your choice, considering the effects of the applied load and support settlement shown, and **find the bending moments at A and B**. (4)

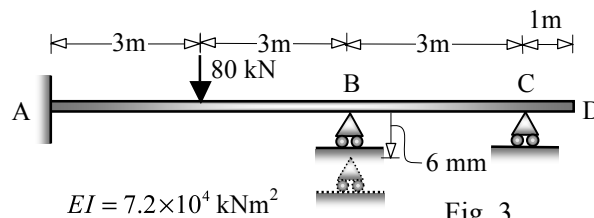


Fig. 3

4. Consider a three-storeyed two-bay symmetric multi-storey frame, with all the beams and columns having a length of 4m. The frame is subject to lateral loads of 40 kN at the lower floor levels and 20 kN at the roof level. Assume the columns to be fixed at the base. Applying the Portal Method, **draw the bending moment diagrams for a typical column and beam at the ground storey**. (3)

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