Code: 9A01403

R09

B.Tech II Year II Semester (R09) Supplementary Examinations December/January 2014/2015

STRUCTURAL ANALYSIS - I

(Civil Engineering)

Time: 3 hours Max. Marks: 70

Answer any FIVE questions

All questions carry equal marks

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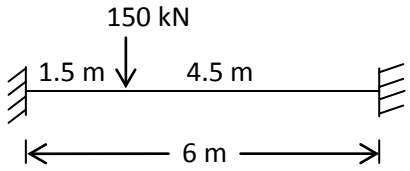
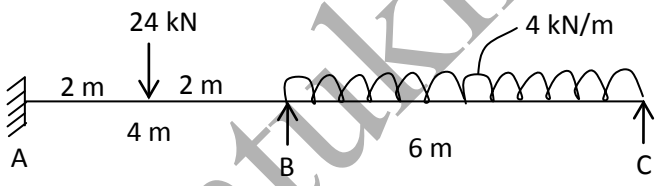
1 (a) What are the advantages of fixed beam?

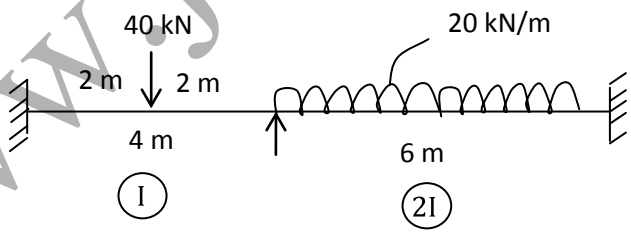
(b) A fixed beam of 6 m span carries a contentrated load of 150 kN at a distance of 1.5 m from the left support. Calculate the B.M at mid span and draw BMD.



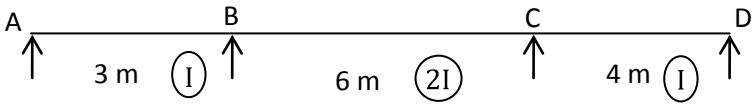
2 Analyze the beam by Clapeyron's theorem and draw BMD & SFD.



3 Analyze the beam by slope deflection method.



4 Analyze the beam by moment distribution method. The beam at supports B and C sinks by 2 mm and 7 mm. Take E = 200 kN/mm^2 and I = 2.5 x 10^7 mm^4.



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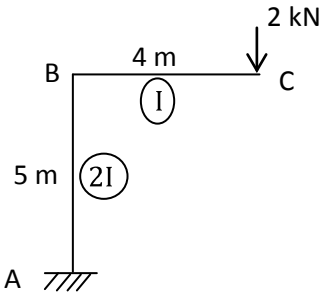
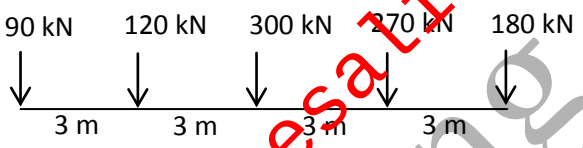
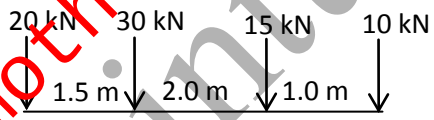
5 Determine the vertical deflection at 'C' in the frame shown below. Take $E = 200 \times 10^6\ kN/m^2$ and I = 3 x 10^7 mm^4.



6 A train of five wheel loads crosses a span of 30 m calculate max +ve and –ve SF at mid span and absolute BM anywhere in the span.



7 A simply supported beam of span 20 m is subjected to a set of loads of magnitude of 20 kN, 30 kN, 15 kN and 10 kN spaced as shown in figure and it moving from left to right with 10 kN load leading.



8 Write short notes:

(a) Statistical redundancy criterion for space frame.

(b) Castigliano's theorem I and II.

(c) Kinematic indeterminacy.

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