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Question Paper Code: 1036146

B.E. / B.Tech. DEGREE EXAMINATIONS, NOV/ DEC 2024
Sixth Semester
Civil Engineering
CE8602 – STRUCTURAL ANALYSIS II
(Regulation 2017)

Time: Three Hours Maximum: 100 Marks

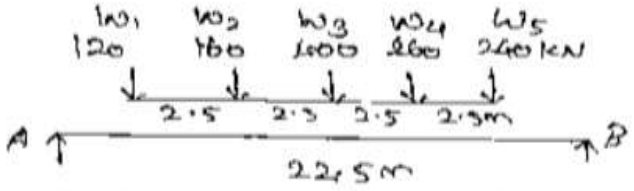
Answer ALL questions

PART – A (10 x 2 = 20 Marks)

1. What is mean by statically determinate beams?
2. How to calculate critical stress?
3. State Muller Breslau's principle.
4. Summarize support reactions?
5. Classify the types of arches based on the number of hinges.
6. Explain the term Horizontal thrust.
7. List the types of stiffening girders?
8. Illustrate cable structures?
9. Define plastic analysis of structure.
10. Write short notes on load factor.

PART – B (5 x 13 = 65 Marks)

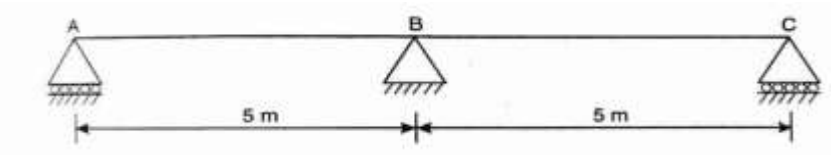
11. (a) A train of 5 wheel loads crosses a ss beam of span 22.5m.using influence lines, calculate the max positive shear forces at mid span and absolute max bending moment anywhere in the span. (13)



(OR)

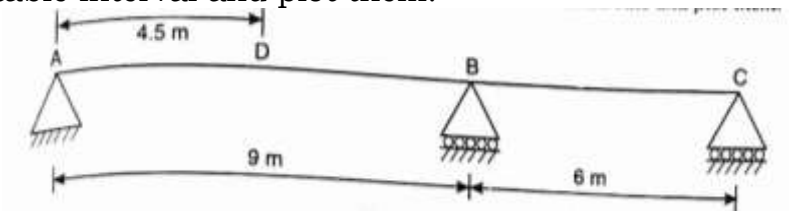
(b) A single rolling load of 100 kN moves on a girder of span 20m.
(a) Construct the influence lines for
(i) shear force and
(ii) bending moment for a section 5m from the left support.
(b) Construct the influence lines for points at which the maximum shears and maximum bending moment develop. Determine these values. (13)

12. (a) Determine the influence lines for RA for the continuous beam shown. Compute the influence lines at 1m interval. (13)

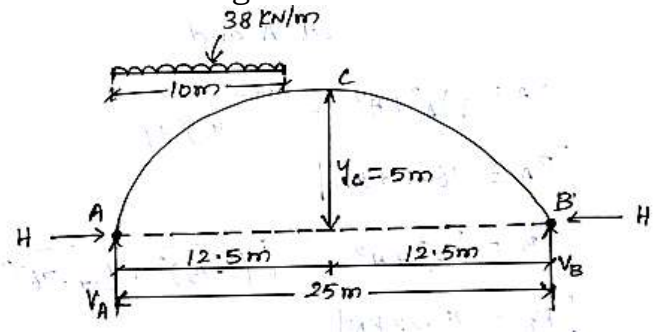


(OR)

(b) Using Muller Breslau's principal draw the IL for the bending moment at the middle point D of span AB of the continuous beam ABC as shown. Determine the IL ordinates at suitable interval and plot them. (13)

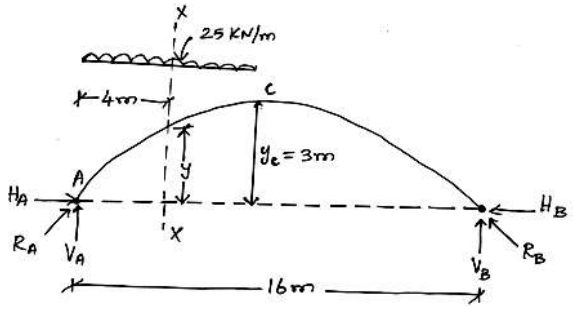


13. (a) A two hinged parabolic arch of span 25 m and rise 5 m carries an udl of 38 kN/m covering a distance of 10 m from left end. Find the horizontal thrust, the reactions at the hinges and the maximum negative moment. (13)



(OR)

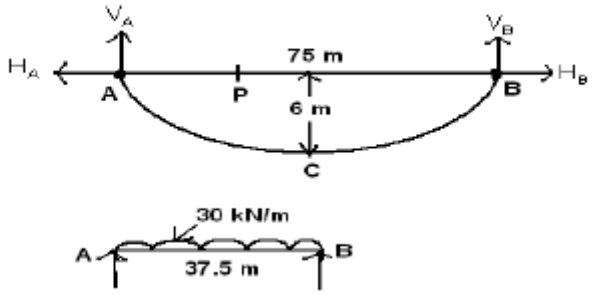
(b) A parabolic 3 hinged arch carries a UDL of 25 kN/m on the left half of the span. It has a span of 16 m and a central rise of 3 m. Determine the resultant reaction at supports. Find also the bending moment, normal thrust and radial shear at a section 4 m from left support. (13)



14. (a) A suspension bridge of 100m span has two numbers of three hinged stiffening girder supported by cables with a central dip 10m. If three points loads of 20kN each are placed at the central line of the roadway at 10, 15 and 20m from the left hand hinge. Find the shear force and bending moment in each girder of 30m from each end. Also calculate the maximum tension in the cable. (13)

(OR)

(b) A suspension cable of 75 m horizontal span and central dip 6 m has a stiffening girder hinged at both ends. The dead load transmitted to the cable including its own weight is 1500 kN. The girder carries a live load of 30 kN/m uniformly distributed over the left half of the span. Assuming the girder to be rigid, calculate the shear force and bending moment in the girder at 20 m from left support. Also calculate the maximum tension in the cable. (13)



15. (a) Determine the shape factor and plastic moment of the symmetrical steel section (I section). Assume yield stress of steel is 270 MPa. Total depth=600 mm, Breadth of each flange= 250 mm, Depth of each flange =30 mm, Thickness of web= 12 mm. (13)

(OR)

(b) A two-span continuous beam of section is fixed at A and hinged at B and C. Span AB is 8 m and BC is 6 m long. Two-point loads of 50 kN each are acting on AB at 2 m from A and B. Span BC is loaded with uniformly distributed load of intensity 10 kN/m. Determine the Plastic Moment. (13)

PART – C (1 x 15 = 15 Marks)

16. (a) Explain the components and functions of suspension cable with neat diagram.(15)

(OR)

(b) Illustrate the necessity and types of stiffness grider in detail with neat sketch. (15)