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**Question Paper Code: 36104**

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2018

Sixth Semester

Civil Engineering

01UCE604 - STRUCTURAL ANALYSIS – II

(Regulation 2013)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1. Draw influence lines for support reactions in a simply supported beam.
2. Define absolute maximum bending moment.
3. State Muller Breslau's principle.
4. Using Muller Breslau's principle, draw the influence line diagram for prop reaction of a propped cantilever beam.
5. Differentiate three hinged arch and two hinged arch.
6. State Eddy's theorem.
7. Mention the different types of cable structures.
8. Enumerate the main functions of stiffening girders in suspension bridges.
9. What is shape factor?
10. State the static method of plastic analysis.

PART - B (5 x 16 = 80 Marks)

11. (a) A simply supported beam has a span of 15m. UDL of 40kN/m and 5m long crosses the girder from left to right. Draw the influence line diagram for shear force and bending moment at a section 6m from the left end. Use these diagrams to calculate the maximum shear force and bending moment at this section. (16)

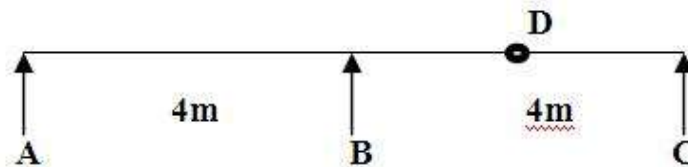
Or

- (b) Two point loads of 100 kN and 200 kN spaced 3 m apart cross a girder AB of span 15 m from left to right with the 100 kN load leading. Draw the influence line for shear force and bending moment and find the value of maximum shear force and bending moment at a section D 6 m from the left hand support. Also find the absolute maximum bending moment due to the given load system. (16)

12. (a) Find the influence line diagram for reaction B in a continuous beam ABC of span AB = 6m and BC = 5m. Support A is hinged and support B and C is roller. Take EI as constant throughout. (16)

Or

- (b) Compute the ordinate of influence line for moment at mid span of BC for the beam shown in fig. at 1m interval and draw influence line diagram. Assume moment of inertia to be constant throughout. (16)



13. (a) A three hinged circular arch of span 16 m and rise 4 m is subjected to two point loads of 100 kN and 80 kN at the left and right quarter span points respectively. Find the reactions at the supports. Find also the bending moment, radial shear and normal thrust at 6m from the left support. (16)

Or

- (b) A symmetrical three hinged parabolic arch of span 40m and rise 8m carries an udl of 30kN/m over the left half of the span. Calculate the reactions at the supports and also bending moment, radial shear and normal thrust at a distance of 10m from the left support. (16)
14. (a) A three hinged stiffening girder of a suspension bridge of span 100m is subjected to two point loads of 200kN and 300kN at the distance of 25m and 50m from left end. Find the shear force and bending moment for the girder at a distance of 30m from left end. The supporting cable has a central dip is 10cm. and also find maximum tension in the cable with its slope. (16)

Or

- (b) Explain the analysis procedure for a space truss using tension coefficient method. (16)
15. (a) A two span continuous beam  $ABC$  has span lengths  $AB = 6\text{ m}$  and  $BC = 6\text{ m}$  and carries a uniformly distributed load of  $30\text{ kN/m}$  completely covering the spans  $AB$  and  $BC$ .  $A$  and  $C$  are simple supports. If the load factor is 1.80 and the shape factor is 1.15 for the ' $T$ ' section, find the section modulus needed. Assume yield stress for the material as  $250\text{ N/mm}^2$ . (16)

Or

- (b) Analyze the propped cantilever beam is carrying UDL of  $w/m$  over the entire span length of  $L$ . Also determine the collapse load, if plastic moment is  $M_p$ . (16)
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