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Question Paper Code: 36104

B.E. / B.Tech. DEGREE EXAMINATION, DEC 2020

Sixth Semester

Civil Engineering

01UCE604 - STRUCTURAL ANALYSIS – II

(Regulation 2013)

Duration: 1.15 hrs

Maximum: 30 Marks

PART A - (6 x 1 = 6 Marks)

(Answer any six of the following questions)

1. When a single load W moves over a simply supported beam, the maximum S.F. at a section will occur when the loads is placed
 - (a) Over the section
 - (b) At centre of span
 - (c) Over the nearer support
 - (d) Over the farther support
2. The influence line for any stress function are used for obtaining the maximum value due to
 - (a) Single point load only
 - (b) Uniform live load only
 - (c) Several point loads
 - (d) All the above
3. The Muller-Breslau principle for influence line is applicable for
 - (a) Simple beam
 - (b) Continuous beam
 - (c) Redundant beam
 - (d) All the above

4. The area of the influence line diagram for the fixed end moment of a fixed beam of span L is
 (a) $L^2/8$ (b) $L^2/12$ (c) $L^2/16$ (d) $L^2/24$
5. A two-hinged arch is
 (a) Statically determinate (b) Statically determinate of 1 degree
 (c) Statically determinate of 2 degree (d) Statically determinate of 3 degree
6. Shape of the influence line diagram for horizontal thrust in a symmetric three – hinged parabolic arch is
 (a) Rectangle (b) Triangle (c) Trapezoidal (d) Parabolic
7. A cable resists the external loads by
 (a) Tension (b) Compression
 (c) Bending (d) Compression and Bending
8. The shape of the cable under horizontal uniform distributed load is
 (a) Parabolic (b) Catenary (c) Circular (d) Triangular
9. The shape factor of a rectangular section is
 (a) 0.5 (b) 1 (c) 1.5 (d) 2
10. The moment capacity of a section at plastic hinge is
 (a) Zero (b) Yield moment
 (c) Twice of Yield moment (d) Fully plastic moment

PART – B (3 x 8= 24 Marks)

(Answer any three of the following questions)

11. 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. (8)
12. 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. (8)

13. 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 6 m from the left support. (8)
14. A three hinged stiffening girder of a suspension bridge of span 100 m is subjected to two point loads of 200 kN and 300 kN at the distance of 25 m and 50 m from left end. Find the shear force and bending moment for the girder at a distance of 30 m from left end. The supporting cable has a central dip is 10 cm . and also find maximum tension in the cable with its slope. (8)
15. 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 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 N/mm^2 . (8)