Reg. No. : | | | | | | | | | | |

Question Paper Code: 31164

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2016

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. What is meant by influence line?
2. Define absolute maximum bending moment.
3. Give some practical examples of rolling loads.
4. Using Muller Breslau's principle, draw the influence line diagram for prop reaction of a propped cantilever beam.
5. List the types of arches.
6. State Eddy's theorem.
7. Give the equation of maximum tension in a cable.
8. Enumerate the main functions of stiffening girders in suspension bridges.
9. What is shape factor?
10. Define collapse load.

PART - B (5 x 16 = 80 Marks)

11. (a) Draw the influence line diagram for shear force and bending moment for a section at 5 *m* from the left hand support of a simply supported beam, 20 *m* long. Hence calculate the maximum bending moment and shear force at the section, due to an uniformly distributed rolling load of length 8 *m* and intensity 10 *kN/m* run. (16)

Or

(b) 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)

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) Make neat diagrams of the influence lines for shearing force and bending moment at a section 3 *m* from one end of a simply supported beam, 12 *m* long. Use the diagrams to calculate the maximum shearing force and the maximum bending moment at this section due to a uniformly distributed rolling load, 5 *m* long of 2 *kN* per meter intensity. Use Muller-Breslau's principle. (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 6*m* from the left support. (16)

Or

(b) A three hinged circular arch of span 16m and rise 4m is subjected to two point loads of 100kN and 80kN 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 hinge. (16)

14. (a) A suspension cable of 130 *m* horizontal span is supported at the same level. It is subjected to a uniformly distributed load of 28.5 *kN* per horizontal metre. If the

maximum tension in the cable is limited to 5000 *kN*, calculate the minimum central dip needed. (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 *m* and *BC* = 6 *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 *'I'* section, find the section modulus needed. Assume yield stress for the material as 250 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 plactic moment is Mp. (16)