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Total No. of Pages : 02

Total No. of Questions : 18

B.Tech. (CE) (2012 to 2017) (Sem.-4)

STRUCTURAL ANALYSIS – I

Subject Code : BTCE-406

M.Code : 56088

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A**Answer briefly :**

1. What does influence line diagram represents, explain.
2. What is Maxwell's reciprocal theorem?
3. When several point loads moving on a beam? What is the condition of maximum B.M.?
4. Differentiate between two hinged and three hinged arch.
5. What will be the effect of change of temperature in suspension cable?
6. What is middle third rule? Describe in brief.
7. What is the limit of eccentricity for no tension criteria in the section?
8. Explain in brief the unit load method of analysis?
9. Differentiate between the method of joints and method of section.
10. What you mean by the determinate structures? How do we check the determinacy of the structure?

SECTION-B

11. A beam of length 'L' is simply supported at its ends and carries point loads of 'W' at a distance 'a' from both the ends. Using conjugate beam method calculate slope at the each end and under each load, determine the deflection under each load and at the centre.
12. A masonry dam 8.5m high 2m wide at the top, 6m wide at the base has its water face vertical and retains water up to 7m. Calculate the maximum and minimum stress intensities at the base. The density of the masonry is 26KN/m^3 and that of water is 10KN/m^3 .
13. A suspension cable is suspended from two piers 200m center to center, one support being 5m above the other, the cable carries a uniformly distributed load of 16 KN/m and has its lowest point 10m below the lower support. The ends of the cable are attached to saddles on rollers at top of piers. The backstays which are assumed straight are inclined at 60° to the vertical. Determine: (A) The maximum tension of the cable. (B) The thrust on the each pier.
14. Compare the maximum tensile stress of thin cylinder and a thin spherical shell having the same internal pressure and the diameter/ thickness ratio. Take $\mu = 0.3$
15. A live load of 30 KN/m , 8m long moves on simply supported girder of 10m span. Find the maximum bending moment that can occur at a section 4m from the left end.

SECTION-C

16. A two hinged parabolic arch of span 'L' and rise 'h' carries a concentrated load "w" at the crown. Determine the expression for horizontal thrust developed at springing.
17. A girder AB of length of 30 m is simply supported at C and D which are 5 and 20m from A respectively. Draw the influence lines from B.M. and S.F. for the midpoint when the girder is crossed by a UDL 'W' KN per meter. Which can be occupying the whole or any part of the span?
18. A suspension bridge cable hangs b/w two points A&B separated horizontally by 140m and with B 30m above A. The lowest point in the cable is 5m below A. The cable supports a stiffening girder weighing 0.44KN/m run which is hinged vertically below A, B and the lowest point of the cable. Calculate the maximum tension which occurs in cable when 15KN load crosses the girder from A to B.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.