

Roll No. Total No. of Pages: 02
Total No. of Questions: 09**B.Tech (Sem.-4th)
STRUCTURAL ANALYSIS-1**

Subject Code: CE-208

Paper ID: [A0609]

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATE:

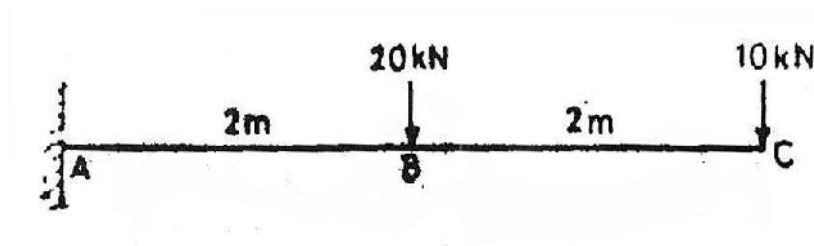
1. Section-A is compulsory consisting of TEN questions carrying two marks each.
2. Section-B contains FIVE questions carrying FIVE marks each and student has to attempt any four questions.
3. Section -C contains THREE questions carrying TEN marks each and student has to attempt any two questions.

SECTION-A**Q.1.** Explain in brief:

- (a) What is Maxwell's reciprocal theorem?
- (b) What is determinate structure? How do we check the determinacy of a structure?
- (c) When several point loads are moving on a beam, what is the condition for maximum bending moment?
- (d) What does influence line diagram represents, explain
- (e) What will be the effect of change in temperature in a suspension cable?
- (f) What difference between two hinged and three hinged arch?
- (g) What is middle third rule? Describe in brief.
- (h) What is limit of eccentricity for no tension criteria in the section?
- (i) Describe in brief the unit load method of analysis.
- (j) What is the difference between method of joints and method of section?

SECTION-B

Q.2. Find the slope and deflection at the free end of the cantilever beam shown in Fig.1. Take $E=200 \text{ KN/mm}^2$ and $i=1.68 \times 10^8 \text{ mm}^4$

**Figure:1**

- Q.3.** Compare (a) the maximum tensile stress, of a thin cylinder and a thin spherical shell having the same internal pressure and the diameter /thickness ratio. Take $\mu = 0.3$
- Q.4.** Find the vertical and horizontal deflections of the joint C of the pin jointed truss shown in Fig.2 The area of horizontal member is 150mm^2 and the areas of the members AC and BC are 200mm^2 Take $E = 200\text{ KN/mm}^2$

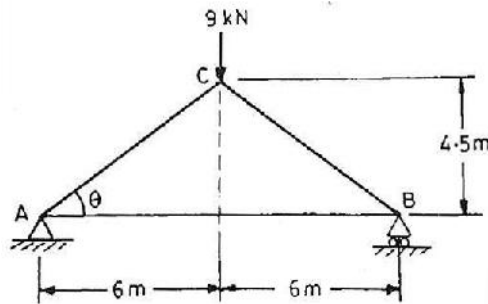


Figure:2

- Q.5.** A masonry retaining wall of trapezoidal section is 6 metres high and 1 metre wide at the top, retaining soil level with its top. Find the minimum bottom width of the wall in order tension may not be induced at the base. Masonry and soil weigh 23000 N and 16000 N per cubic metre respectively. The angle of repose of the soil is 30° and the back face of the wall is vertical.
- Q.6.** A live load of 20KN/m , 6 m long moves on a simply supported girder of 10 m span. Find the maximum bending moment that can occur at a section 4 m from the left end.

SECTION-C

- Q.7.** A girder AB of length of 30 m is simply supported at C and D which are 5 and 20 respectively from A. Draw the influence lines for B.M and S.F for the mid point when the girder is crossed by a uniformly distributed load 'w' kN per metre which can occupy the whole or any part of the span.
- Q.8.** 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.
- Q.9.** A suspension bridge cable hangs between two points A and B separated horizontally by 120 m and with B 20M above A. the lowest point in the cable is 4 m below A. The cable supports a stiffening girder weighing 0.33 KN/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 a 10 Kn load crosses the girder from A to B.

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