

B.Tech. (Sem. - 4th)
STRUCTURAL ANALYSIS - I
SUBJECT CODE : CE - 208
Paper ID : [A0609]

[Note : Please fill subject code and paper ID on OMR]

Time : 03 Hours

Maximum Marks : 60

Instruction to Candidates:

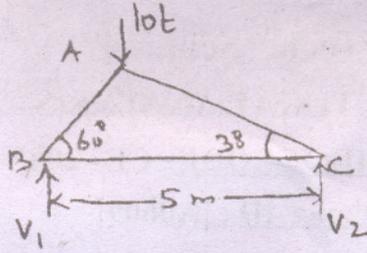
- 1) Section - A is **Compulsory**.
- 2) Attempt any **Four** questions from Section - B.
- 3) Attempt any **Two** questions from Section - C.

Section - A**Q1)****(10 × 2 = 20)**

- a) State the moment area theorem.
- b) How to find the deflection by strain energy method for a cantilever with concentrated load at the free end.
- c) For a pressure of liquid P in their cylinder, find the stresses acting on it.
- d) Derive expression for strain in their cylinder.
- e) What is the basic difference between method of joints and method of sections.
- f) What are the failures criteria of dams. What is the no tension criteria for a dam section.
- g) Draw influence line for shear force for a point in cantilever or overhang.
- h) Draw influence line for shear force and B.M for single load W moving on the span.
- i) Differentiate between two hinged and fixed arches.
- j) Find the horizontal reaction for uniformly loaded cable.

Section - B**(4 × 5 = 20)****Q2)** Find the deflection of a cantilever beam with point load at the end.**Q3)** Derive expression for change in volume of a thin cylindrical shell due to an internal pressure.

- Q4) Find the forces in the members AB, AC and BC of a truss having a span of 5 meters by method of sections. It is carrying a load of 10 tonnes.



- Q5) A concrete dam of trapezoidal section having water on vertical face is 16m high. The base of the dam is 8m wide and top 3m wide. Find
- The resultant thrust on the base per m length of the dam.
 - The point where the resultant thrust cuts the base. Take Wt of concrete as 25kN/m^3 and water level coinciding with the top of the dam.
- Q6) Find the magnitude of Bending moments for udl shorter than the span for moving loads.

Section - C

(2 × 10 = 20)

- Q7) Determine the influence line for deflection at free end as well as at a distance 'a' from the free end of a cantilever.
- Q8) (a) Derive an expression for radial shear F and normal thrust N for a three hinged arch.
- (b) A symmetrical parabolic arch with a central hinge, of rise r and span L is supported at its ends on pins at the same level. What is the value of horizontal thrust when a load W which is uniformly distributed horizontally covers the whole span. Also find the B.M at any point in the arch rib.
- Q9) (a) A cable is swung between two points at the same level with a central dip of 12m over a span of 120m. The cable carries a udl of intensity 2kN/m of horizontal length. Calculate the change in the horizontal tension if the temperature rises by 20°F from the original take $\alpha = 6 \times 10^{-6}$ per 1°F .
- (b) Derive an expression for temperature stresses in suspension cable.

