



VIT[®]

Vellore Institute of Technology

(Approved to the University under section 3 of UGC Act, 1956)

Continuous Assessment Test – II

Prog. Name & Branch: BTech Civil Engineering

Duration: 90 mins

Slot: C1+TC1

Course Code: CLE 2002

Course Title: Strength of Materials

Faculty Name: Ajeesh S S

Maximum Marks: 50

General instruction:

Answer all questions

Section – A (10 x 5 = 50 marks)

1. A cantilever beam of span 4 m is subjected to uniformly distributed load of 5 kN/m. The cross section of the beam is 250 mm width and 500 mm depth. Plot the variation of bending stress and shear stress along the depth of beam at free end, support and mid span of cantilever.
2. A simply supported beam of span 4 m is subjected to a point load of 20 kN at 1 m from the left support and a UDL of 10 kN/m over a length of 2 m from the right support. Determine: (a) slope at the ends (b) slope at the centre (c) deflection under the load (d) deflection at the centre and e) maximum deflection.
3. A cantilever beam of span 5 m is subjected to a concentrated force of 150 kN at a distance 3 m from the free end. Determine the variation of slope and deflection along the length of the beam using conjugate beam method. Take $E = 2 \times 10^5 \text{ N/mm}^2$ and $I = 2500 \text{ cm}^4$.
4. Determine the slope at supports and deflection at centre of a simply supported beam of span 3 m and subjected to UDL of 15 kN/m. Use Moment area method. Take $E = 2 \times 10^5 \text{ N/mm}^2$ and $I = 1000 \text{ cm}^4$.
5. A thin cylinder, 400 mm internal diameter is expected to carry an internal pressure of 60000 N/m². If the safe strength of the material of the cylinder is 75 N/mm², what is the thickness required for the cylinder?