Roll No. | | | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 08

B. Arch.(2012 & Onwards) (Sem.–2)

THEORY OF STRUCTURES – I

Subject Code : BACH-207

Paper ID : [A1239]

Time : 3 Hrs. Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. **Question No. 1 is Compulsory**
2. **Attempt any FOUR Questions from Question no.2-8.**
3. **Missing data, if any may be assumed suitably.**
4. **Draw neat sketches wherever necessary.**

1. Answer briefly : (2×6=12)

a) Define the term '*Poisson's Ratio*'.

b) Explain the term Section Modulus.

c) Differentiate between *deficient* and *redundant frame*.

d) Define '*Second Moment of Area*'.

e) What is the neutral axis of a beam?

f) Define Centre of Gravity.

2. A beam 100 mm wide and 200mm deep is simply supported over a span of 5 meters, carries a total uniformly distributed load of 40 kN, determine bending stress at- (i) Supports (ii) Max. bending stress (iii) Stress at a distance of lm from supports. (12)

3. a) State and prove the theorem of Parallel axis. (4)

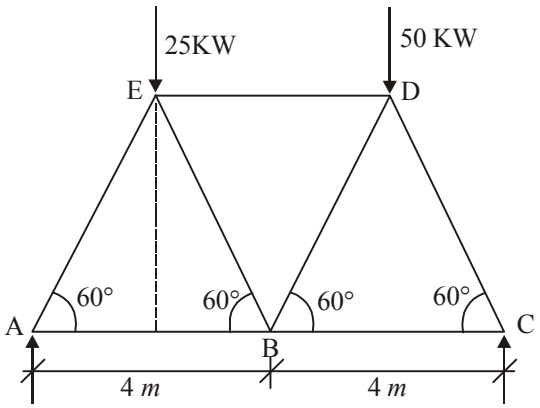
b) Calculate centre of gravity and moment of inertia about X-X axis and Y-Y axis of the inverted T-section 200×200×20mm. Also calculate the section modulus. (8)

4. Derive an expression for M.O.I. of a rectangular lamina by method of integration.

5. A simply supported beam of span 5.0 m carries a u.d.l. of 5 kN/m over the whole span in addition to a point load of 10 kN at mid-point. Draw shear force and bending moment diagram of the beam. (12)

6. Derive an expression for 'Basic Bending Equation' using usual notation. What are the assumptions made for the derivation? (12)

7. Find magnitude and nature of forces in all members of frame given in figure using method of joints. (12)



8. Write short notes on : (12)

a) Gravity loads.

b) Lateral loads.

c) Coplanar force system.

d) Resultant of concurrent force system.