

QUESTION BANK

Subject Name:- Professional Elective-II (Strength of Material)

Subject Code:-BTCHE 405 (C)

- 1) Young's modulus is defined as the ratio of _____ (1M)
 - (A) Volumetric stress and volumetric strain.
 - (B) Lateral stress and lateral strain.
 - (C) Longitudinal stress and longitudinal strain.
 - (D) Shear stress to shear strain.

- 2) State the relationship between modulus of elasticity, modulus of rigidity and bulk modulus.(3M)

- 3) Mention Various types of stresses. .(4M)

- 4) Mention various types of strain. .(3M)

- 5) What are the condition for perfect trusses? (3M)

- 6) what are thermal stresses and strain? .(3M)

- 7) Define Torsion. .(1M)

- 8) Derive Basic torsion equation. .(4M)

- 9) What are deflection and slope of beam? .(3M)
- 10) What are crippling loads? .(3M)
- 11) What are shear stress and bending moment? .(3M)
- 12) What are Columns and Strut? .(2M)
- 13) Define Euler's and Rankine's Approach in columns. .(6M)
- 14) Explain stability of trusses on application of loads. .(5M)
- 15) Explain simply supported beams. .(2M)
- 16) Define thin shell and write the causes of failure of thin shells.(4M)
- 17) State the various end conditions of column (3M)
- 18) A thin cylindrical shell 100 cm diameter, 1cm thick and 5 m long is subjected to an Internal fluid pressure of 5 N/mm². Calculate (a) hoop stress and longitudinal stress, (b) circumferential strain, (c) longitudinal strain and (d) volumetric strain. Assume $E = 2 \times 10^5$ N/mm² and Poisson's ratio = 0.3. (5M)
- 19) List any three types of beams. (4M)
- 20) A cantilever beam of length 3 m carries a point load of 40 kN at free end. Find the deflection of the beam at the free end. Assume $I = 8 \times 10^7$ mm⁴ and $E = 2.1 \times 10^5$ N/mm². (5M)
- 21) A cantilever beam of length 3 metres carries udl of 2 kN/m over a length of 2 m from the fixed end and a point load of 2 kN at the free end. Find the deflection at the free end. If $I = 14 \times 10^7$ mm⁴ and $E = 0.1 \times 10^5$ N/mm² (5M)

22) A circular shaft of diameter 50 mm transmits 1500 N-m torque. Find the shear stress induced in it.(3M)