

- (B) A load of 10kN is to be raised with help of a steel wire. Find the minimum diameter of the wire , if the stress is not to exceed 80 N/mm^2 (7)
- Q-4 Attempt all questions (14)**
- (A) A steel rod 15mm in diameter and 200mm long is heated through 100°C and at the same time subjected to an axial pull “p”. if total extension of the rod is 0.30 mm. calculate the magnitude of the pull “p”. The coefficient of liner expansion of steel is $12 \times 10^{-6} / ^\circ\text{C}$ and $E = 200 \text{ kN/mm}^2$. (7)
- (B) A beam simply supported and carries an U.D.L of 40 kN/m Over whole span. The size of beam is 150mm x 400mm. if maximum stress in the material of beam is 100 N/mm^2 find span of beam. (7)
- Q-5 Attempt all questions (14)**
- (A) Derive equation of bending stress. (7)
- (B) A simply supported beam 300mm deep is simply supported over a span of 4m. what u.d.l. per meter the beam can carry, if the bending stress is not exceed 150 N/mm^2 take $I = 8 \times 10^6 \text{ mm}^4$. (7)
- Q-6 Attempt all questions (14)**
- (A) Derive Equation for Maximum and Minimum stress in rectangular section (7)
- (B) A circular column 450mm in diameter carries a load of 600KN at an eccentricity of 100 mm. calculate maximum and minimum stresses for the column (7)
- Q-7 Attempt all questions (14)**
- (A) Write the assumption and limitation of Euler’s formula. (7)
- (B) A steel tube of 25mm external diameter and 20mm internal diameter is used as a column 3m long with both ends hinged. Determine the Euler’s crippled load if $E = 2 \times 10^5 \text{ N/mm}^2$. (7)
- Q-8 Attempt all questions (14)**
- (A) Derive strain energy due to impact loading. (7)
- (B) A steel bar 50mm in diameter and 2.5m long has to transmit a shock energy of 100 N.m. calculate the maximum instantaneous stress and elongation produced. Take $E = 2 \times 10^5 \text{ N/mm}^2$ (7)

