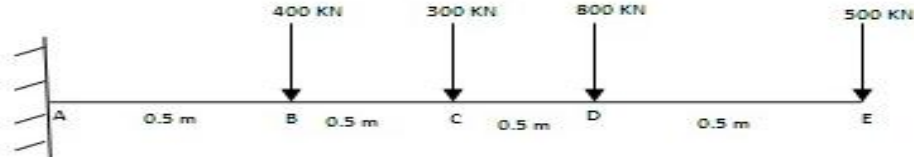




(B) Draw Shear force and Bending Moment Diagram for following beam. (7)



Q-4 Attempt all questions (14)

(A) Derive the stress value based on the strain energy stored due to impact loading. (7)

(B) A bar 50 mm in diameter is 3.0 m long. An axial load of 150 kN is suddenly applied to it. Find The maximum instantaneous stress (7)

The maximum instantaneous elongation

The work stored in the bar at the instant of maximum elongation

Take $E = 200 \times 10^3 \text{ N/mm}^2$.

Q-5 Attempt all questions (14)

(A) Explain first castigliano's theorems. (7)

(B) A short column rectangular section 250mm x 200 mm is subjected to a load of 400 kN at a point 50 mm from longer side and 100 mm from shorter side. Find maximum and minimum stresses in the column. (7)

Q-6 Attempt all questions (14)

(A) What is effective length for column when: (7)

- (1) Both ends hinged
- (2) Both end fixed
- (3) One end fixed and other hinged
- (4) One end fixed and other free

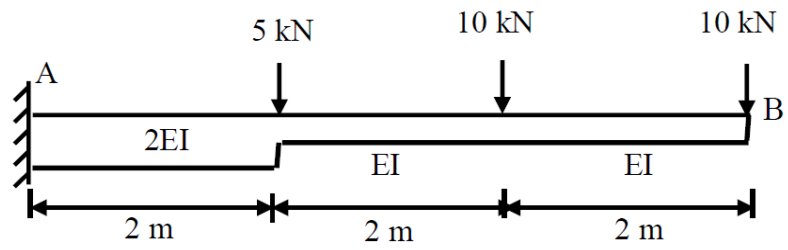
(B) A hollow cast iron column has outside diameter 200mm and thickness of 20mm. It is 4.5m long and fixed at both ends. Calculate the safe load and ratio of Euler's and Rankine's critical load. For cast iron $F_c = 550\text{N/mm}^2$, $\alpha = 1/1600$ and $E = 0.8 \times 10^5 \text{ N/mm}^2$ (7)

Q-7 Attempt all questions (14)

(A) Write assumption in Euler's formula (7)

(B) Find the slope and deflection at the free end B of a cantilever beam AB as shown in fig. by moment area method. Take $I = 2 \times 10^8 \text{ mm}^4$, $E = 2 \times 10^5 \text{ N/mm}^2$ (7)





Q-8

Attempt all questions

(14)

Explain in detail Stress-Strain Curve for mild steel with diagram.

