

Module-4

- 7 a. Define : (i) Crushing load (ii) Crippling load. (04 Marks)
b. A solid round bar of 3 m long and 50 mm in diameter is used as strut and $E = 2 \times 10^5 \text{ N/mm}^2$. Determine crippling load/crushing load when (i) Both the ends are hinged (ii) One end is fixed and other end is free. (16 Marks)
- 8 a. Define (i) Effective length (ii) Slenderness ratio. (04 Marks)
b. Determine crippling load for an I-section with $400 \times 200 \times 10 \text{ mm}$ size having length of 6 m used as strut with both ends fixed. $E = 2.1 \times 10^5 \text{ N/mm}^2$ and Factor of safety (FS) = 3. (16 Marks)

Module-5

- 9 a. Define short column and long column according to IS 456:2000. (04 Marks)
b. Calculate ultimate load carried by a RCC column of size $500 \text{ mm} \times 500 \text{ mm}$ and reinforced with 8 bars of 16 mm diameter. Grade of steel and concrete used are Fe415 and M20 respectively. (16 Marks)
- 10 Calculate ultimate load carried by the circular column of diameter 300 mm and reinforced with 6 bars of 16 mm diameter. Grade of concrete and steel used are
(i) M20 and Fe415
(ii) M15 and Fe500. (20 Marks)

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