

QUESTION

10. A vertical column of height h is supported by a fixed base. The column is subjected to a uniformly distributed load of intensity w acting horizontally. The deflection of the column is given by the equation $y = \frac{w}{24EI} x^2 (3h - x)$, where x is the distance from the top of the column to the point of interest. The deflection at the top of the column is:



ANSWER

- (A) $\frac{wh^3}{24EI}$ (B) $\frac{wh^3}{12EI}$ (C) $\frac{wh^3}{6EI}$ (D) $\frac{wh^3}{3EI}$

SOLUTION

At the top of the column, $x = 0$ and $y = 0$. At the bottom of the column, $x = h$ and $y = 0$. The deflection at the top of the column is:

At $x = h$,

$$y = \frac{w}{24EI} x^2 (3h - x)$$
$$y = \frac{w}{24EI} h^2 (3h - h)$$
$$y = \frac{wh^3}{12EI}$$

Therefore, the correct answer is (B).

ANSWER

- (A) $\frac{wh^3}{24EI}$ (B) $\frac{wh^3}{12EI}$ (C) $\frac{wh^3}{6EI}$ (D) $\frac{wh^3}{3EI}$