

**TOPIC**

Engineering Mechanics (Statics and Dynamics)

**QUESTION**

A body is traveling in a straight line. The equation of motion is given by

$$x(t) = 5t^3 + 3t^2 - 6t$$

where

$x$  is given in meters, and

$t$  is given in seconds.

The acceleration of the body in  $\text{m/s}^2$  at  $t = 5.25$  seconds most nearly is

- (A) 6.000
- (B) 163.5
- (C) 436.8
- (D) 752.9

**HINT**

$$\text{Acceleration} = \frac{d^2x}{dt^2}.$$

So differentiate the expression of location  $x$ , twice with respect to time to get the expression for acceleration. Then substitute  $t=5.25$  in the resulting expression.

**ACKNOWLEDGEMENT**

*This question of the day was provided by the courtesy of Professor [Autar Kaw](#) of the [University of South Florida](#) from the book [Fundamentals of Engineering Examination Sample Questions General Engineering](#).*