Q1:

The average speed of a moving object during a given interval of time is always:

A. the magnitude of its average velocity over the interval  
B. one-half its speed at the end of the interval  
C. its acceleration multiplied by the time interval  

D. the distance covered during the time interval divided by the time interval  
E. one-half its acceleration multiplied by the time interval.

Ans:  
\[ D \]

Q2:

The coordinate of an object is given as a function of time by \( x = 7t - 3t^2 \), where \( x \) is in meters and \( t \) is in seconds. Find its average velocity (in m/s) over the interval from \( t = 0 \) to \( t = 4 \) s. (Give your answer in three significant figures form)

Ans:

\[ v_{avg} = \frac{\Delta x}{\Delta t} = \frac{x_2 - x_1}{t_2 - t_1} \]

where \( x_1(t = 0) = 0; x_2(t = 4) = 7(4) - 3(4)^2 = -20 \) m

\( \Rightarrow v_{avg} = \frac{-20 - 0}{4 - 0} = -5.00 \) m/s

Q3:

A car is allowed to move in the positive x-direction only. The car left position \( x_1 = 3 \) m at \( t_1 = 2 \) s and reached position \( x_2 \) at time \( t_2 = 10 \) s with an average speed of \( 25 \) m/s, find \( x_2 \) (in m). (Give your answer in three significant figures form)

Ans:

\( x_1 = 3 \) m; \( x_2 =? \)

\( t_1 = 2 \) s; \( t_2 = 10 \) s

\( S_{avg} = 25 \) m/s

\[ S_{avg} = \frac{\text{total distance}}{\text{time change}} = \frac{x_2 - x_1}{t_2 - t_1} \]

\( \Rightarrow 25 = \frac{x_2 - 3}{10 - 2} \Rightarrow x_2 = 8 \times 25 + 3 = 203 \) m