

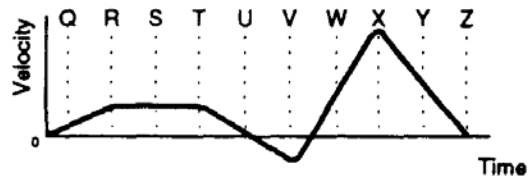
Graphical Interpretation of Motion

Directions: Circle your answer choice and provide a brief justification for that answer. For example, if you found your answer by using the area under the graph, just shade that area. If you used slope, show the calculation or "box in" the region you used for the slope.

- 1) Acceleration versus time graphs for five objects are shown below. All axes have the same scale. Which object had the greatest change in velocity during the interval?



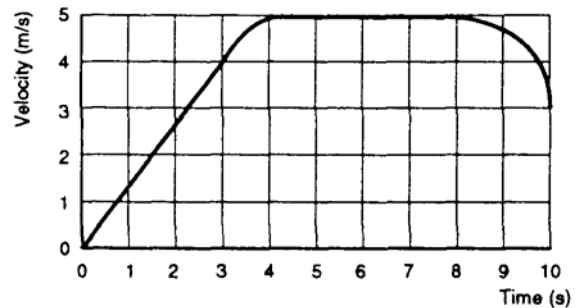
- 2) When is the acceleration the most negative?
 (A) R to T
 (B) T to V
 (C) V
 (D) X
 (E) X to Z



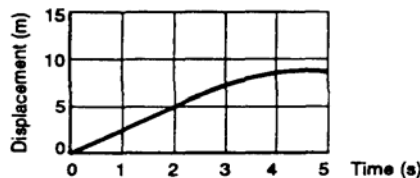
- 3) To the right is a graph of an object's motion. Which sentence is the best interpretation?
 (A) The object is moving with a constant, non-zero acceleration.
 (B) The object does not move.
 (C) The object is moving with a uniformly increasing velocity.
 (D) The object is moving at a constant velocity.
 (E) The object is moving with a uniformly increasing acceleration.



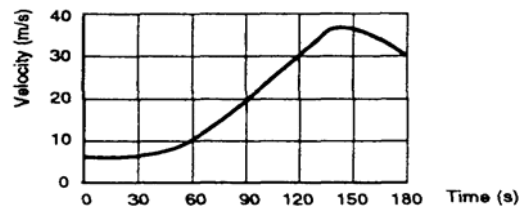
- 4) An elevator moves from the basement to the tenth floor of a building. The mass of the elevator is 1000 kg and it moves as shown in the velocity-time graph below. How far does it move during the first three seconds of motion?
 (A) 0.75 m
 (B) 1.33 m
 (C) 4.0 m
 (D) 6.0 m
 (E) 12.0 m



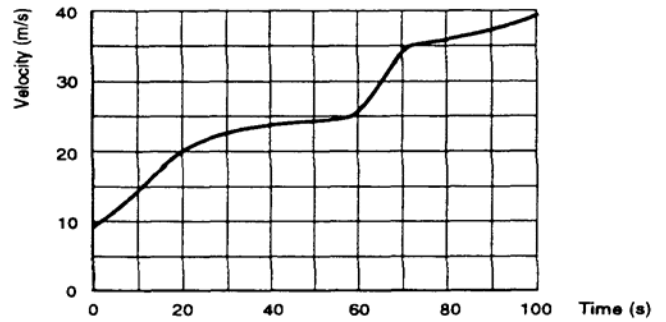
- 5) The velocity at the 2 second point is:
 (A) 0.4 m/s
 (B) 2.0 m/s
 (C) 2.5 m/s
 (D) 5.0 m/s
 (E) 10.0 m/s



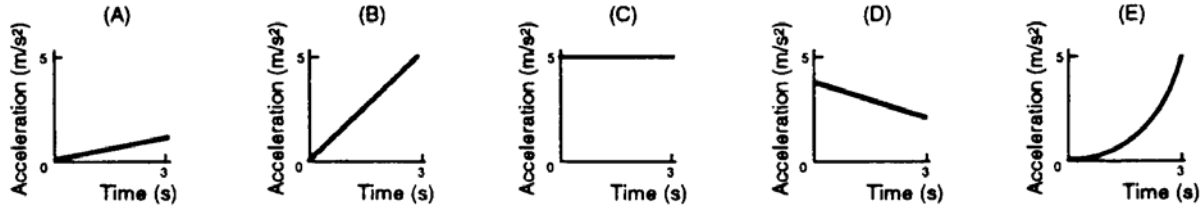
- 6) This graph shows velocity as a function of time for a car of mass 1.5×10^3 kg. What was the acceleration at the end of 90 s?
 (A) 0.22 m/s^2
 (B) 0.33 m/s^2
 (C) 1.0 m/s^2
 (D) 9.8 m/s^2
 (E) 20 m/s^2



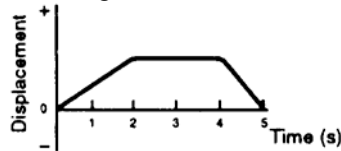
- 7) The motion of an object traveling in a straight line is represented by the following graph. At time = 65 s, the magnitude of the instantaneous acceleration of the object was most nearly:
- (A) 1 m/s^2
 (B) 2 m/s^2
 (C) $+9.8 \text{ m/s}^2$
 (D) $+30 \text{ m/s}^2$
 (E) $+34 \text{ m/s}^2$



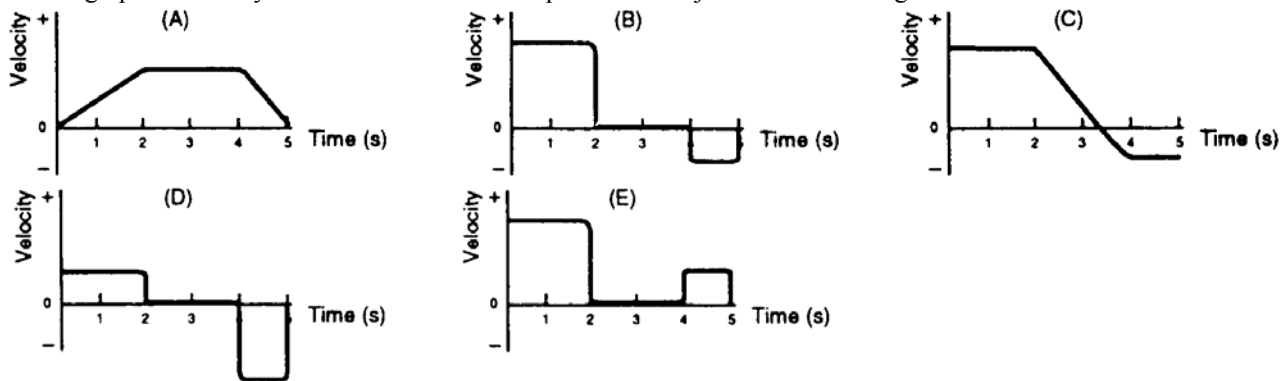
- 8) Five objects move according to the following acceleration versus time graphs. Which has the smallest change in velocity during the three-second interval?



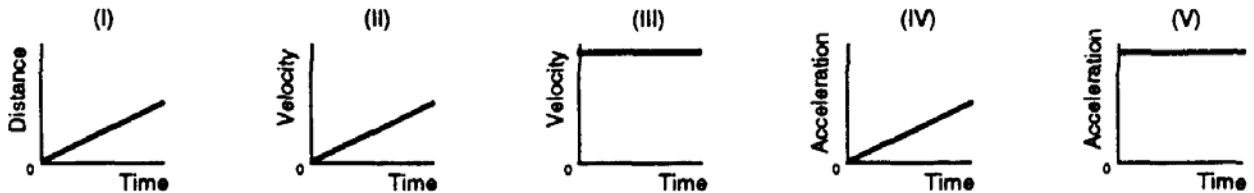
- 9) Below is a displacement-time graph for an object during a 5 s time interval.



Which graph of velocity versus time would best represent the object's motion during the same time interval?



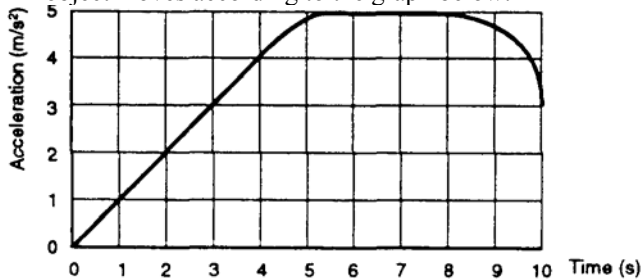
- 10) Consider the following graphs, noting the different axes:



Which of these represent(s) motion at constant velocity?

- (A) I, II, and IV (B) I and III (C) II and V (D) IV only (E) V only

11) An object moves according to the graph below:

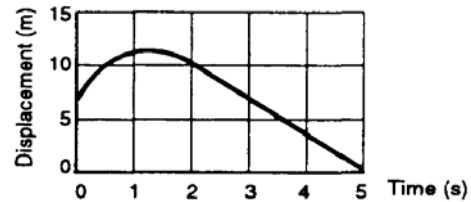


The object's change in velocity during the first three seconds of motion was:

- (A) 0.66 m/s
- (B) 1.0 m/s
- (C) 3.0 m/s
- (D) 4.5 m/s
- (E) 9.8 m/s

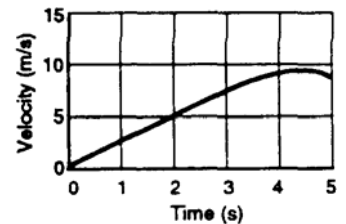
12) The velocity at the 3 second point is about:

- (A) - 3.3 m/s
- (B) - 2.0 m/s
- (C) - 0.67 m/s
- (D) 5.0 m/s
- (E) 7.0 m/s

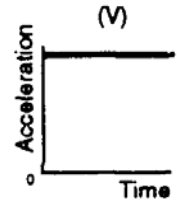
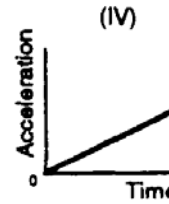
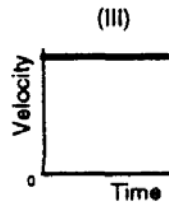
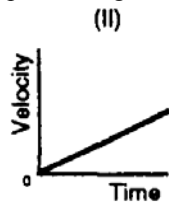
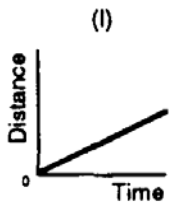


13) If you wanted to know the distance covered during the interval from $t = 0$ s to $t = 2$ s, from the graph below you would:

- (A) read 5 directly off the vertical axis.
- (B) find the area between that line segment and the x -axis by calculating $(5 \times 2)/2$.
- (C) find the slope of that line segment by dividing 5 by 2.
- (D) find the slope of that line segment by dividing 15 by 5.
- (E) Not enough information to answer.



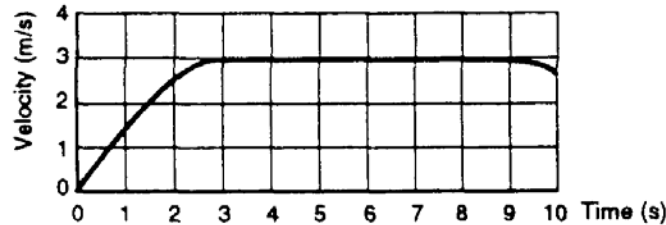
14) Consider the following graphs, noting the different axes:



Which of these represent(s) motion at constant, non-zero acceleration?

- (A) I, II, and IV
- (B) I and III
- (C) II and V
- (D) IV only
- (E) V only

15) An object moves according to the graph below:



How far does it move during the interval from $t = 4$ s to $t = 8$ s?

- (A) 0.75 m
- (B) 3.0 m
- (C) 4.0 m
- (D) 8.0 m
- (E) 12.0 m