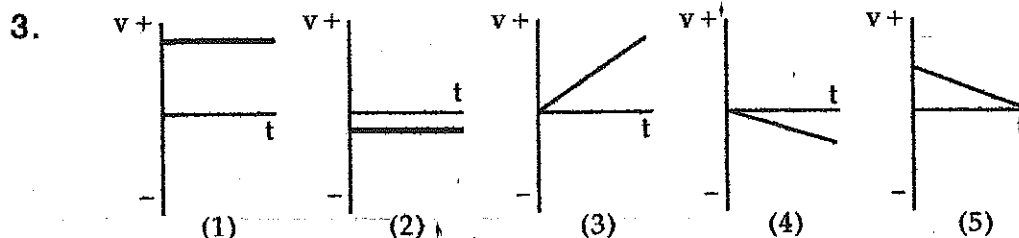


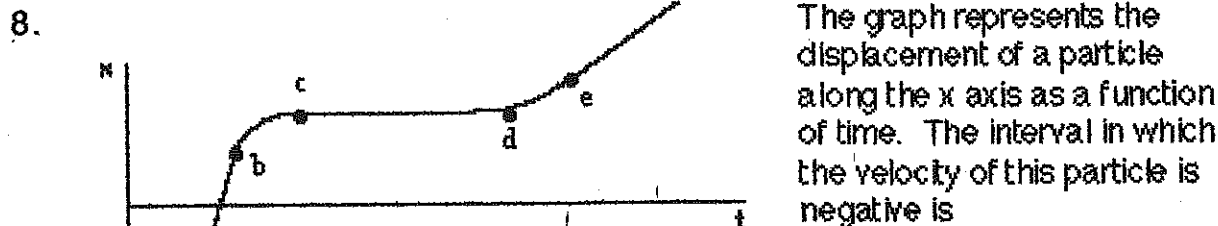
A.P. "C" Kinematics Practice

1. A particle moves from $x_0 = 30$ cm to $x = -40$ cm in 5 s. The average velocity of the particle during this time interval is
- a. 2 cm/s b. -2 cm/s c. 14 cm/s d. -14 cm/s e. -140 cm/s
2. The displacement of an object during any time interval is always _____ the distance it travels during that same time interval.
- a. greater than or equal to b. less than or equal to c. equal to
d. greater than e. much greater than

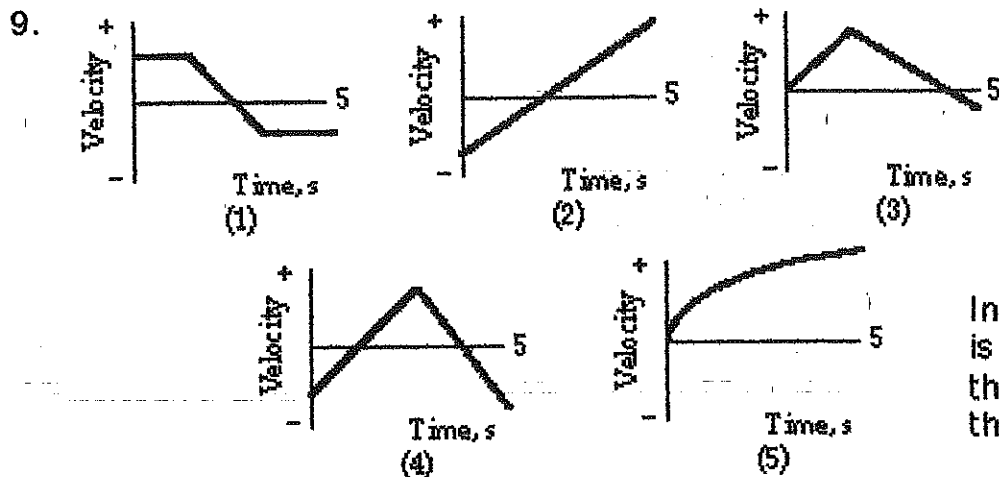


- In which graph of v versus t does the particle end up closest to its starting point?
- a. 1 b. 2 c. 3 d. 4 e. 5
4. If the speed of particle A is twice that of particle B, the distance particle B travels in a given interval of time as compared with particle A is
- a. twice as great. b. half as great. c. the same.
d. four times as great. e. one-fourth as great.
5. Assume that the Deschutes River has straight and parallel banks and that the current is 0.75 m/s. Drifting down the river, you fall out of your boat and immediately grab a piling of the Warm Springs Bridge. You hold on for 40 s and then swim after the boat with a speed relative to the water of 0.95 m/s. The distance of the boat downstream from the bridge when you catch it is
- a. 67 m b. 90 m c. 78 m d. 54 m e. 120 m
6. If the position of an object is plotted vertically on a graph and the time is plotted horizontally, the instantaneous velocity at a particular time is
- a. the height of the curve at that time.
b. the total length of the curve.
c. the slope of the tangent to the curve at that time.
d. the area under the curve from zero to that time.
e. impossible to determine from this type of plot.

7. On a graph that shows position on the vertical axis and time on the horizontal axis, a straight line with a negative slope represents
- a constant positive acceleration.
 - a constant negative acceleration.
 - zero velocity.
 - a constant positive velocity.
 - a constant negative velocity.



- a-b
- b-c
- d-e
- c-d
- none of these.



In which graph is the particle the farthest from the origin at $t = 5s$?

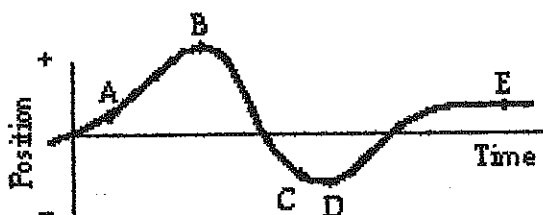
- 1
- 2
- 3
- 4
- 5

10. A car accelerates uniformly from rest to a speed of 20 m/s at the end of 1 min; it then accelerates uniformly to a speed of 40 m/s at the end of the next minute. During this 2-min period, the average speed of the car is

- 7.5 m/s
- 30 m/s
- 15 m/s
- 20 m/s
- 40 m/s

11. On a graph that shows position on the vertical axis and time on the horizontal axis, a parabolic curve that opens upward represents
- a constant positive acceleration.
 - a constant negative acceleration.
 - no acceleration.
 - a positive followed by a negative acceleration.
 - a negative followed by a positive acceleration.
12. On a graph that shows velocity on the vertical axis and time on the horizontal axis, zero acceleration is represented by
- a straight line with a positive slope.
 - a straight line with a negative slope.
 - a straight line with zero slope.
 - either a, b, or c.
 - none of these.
13. On a graph that shows velocity on the vertical axis and time on the horizontal axis, the area under the curve represents
- average acceleration.
 - average velocity.
 - displacement.
 - average speed.
 - no useful physical quantity.

14.



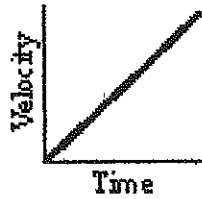
An object moves along the x axis as shown on the diagram. At which point or points is its acceleration zero?

- A and E
 - B, D, and E
 - C only
 - E only
 - B and D
15. An object is dropped from rest near the surface of the earth. If the time interval during which it falls is cut in half, the distance it falls will
- double.
 - decrease by one-half.
 - increase by a factor of four.
 - decrease by a factor of four.
 - not change.

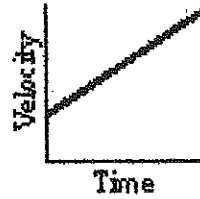
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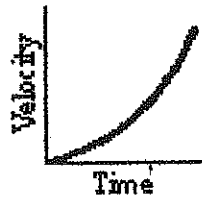
(1)



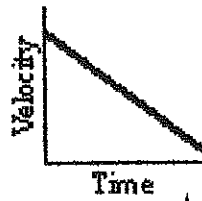
(2)



(3)



(4)



(5)

A car accelerates uniformly from a velocity of 10 km/h to 30 km/h in one minute. Which graph best describes the motion of the car?

a. 1

b. 2

c. 3

d. 4

e. 5

17. A ball is dropped from the top of a building. In the absence of air resistance, the ball will hit the ground with a speed of 49 m/s. The height of the building is

a. 25 m

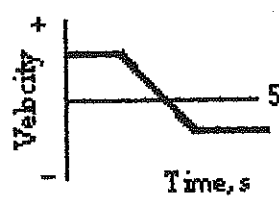
b. 5 m

c. 240 m

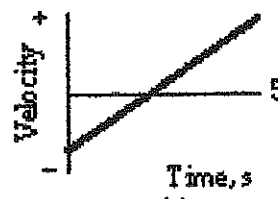
d. 120 m

e. 10 m

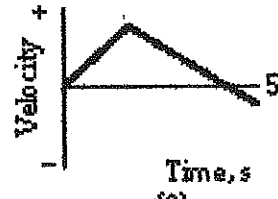
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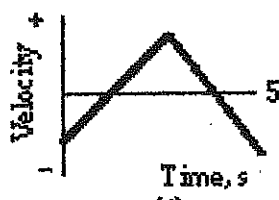
(1)



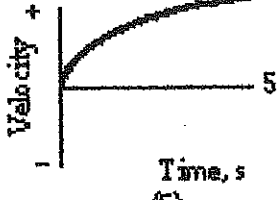
(2)



(3)



(4)



(5)

In which graph does the particle never have a constant acceleration?

a. 1

b. 2

c. 3

d. 4

e. 5

19. A graph of the motion of an object is plotted with the velocity on the vertical axis and the time on the horizontal axis. The graph is a straight line. Which of these quantities CANNOT be determined from this graph?

a. the displacement from time $t = 0$

b. the initial velocity at $t = 0$

c. the acceleration of the object

d. the average velocity of the object

e. All four of the quantities can be determined from the graph.

20. An object falling near the surface of the earth has a constant acceleration of 9.8 m/s^2 . This means that the
- object falls 9.8 m during the first second of its motion.
 - object falls 9.8 m during each second of its motion.
 - speed of the object increases by 9.8 m/s during each second of its motion.
 - acceleration of the object increases by 9.8 m/s^2 during each second of its motion.
 - force of gravity on the object must be 9.8 SI units.
21. A ball is thrown upward from an 80-ft tower with an initial vertical speed of 40 ft/s. If air resistance is ignored, the ball's speed when it reaches the ground will be
- a. 67 ft/s b. $1.3 \times 10^2 \text{ ft/s}$ c. $1.2 \times 10^2 \text{ ft/s}$ d. 49 ft/s e. 82 ft/s
22. A balloon is ascending at a rate of 16 ft/s at a height of 32 ft above the ground when a package is dropped. The time taken, in the absence of air resistance, for the package to reach the ground is
- a. 1.0 s b. 1.5 s c. 2.0 s d. 2.5 s e. 3.0 s
23. An object is thrown upward with a velocity of 32 ft/s from a stationary balloon which is 48 ft above the ground. If air resistance is ignored, the total time until the object impacts the ground is
- a. 1.0 s b. 2.0 s c. 3.0 s d. 4.0 s e. 6.0 s
24. The relationship between the velocity of a body moving along the x axis and time is given by $v = 3t^2 - 2t$, where the units are SI units. The total distance the body travels between the times $t = 2 \text{ s}$ and $t = 4 \text{ s}$ is
- a. 12 m b. 60 m c. 48 m d. 34 m e. 44 m
25. The change in velocity for some time interval can be interpreted as
- the area under the v-versus-t curve for that interval.
 - the area under the x-versus-t curve for that interval.
 - the area under the a-versus-t curve for that interval.
 - the slope of the a-versus-t curve.
 - none of these.

