1. A car moving at a speed of 8.0 meters per second enters a highway and accelerates at 3.0 meters per second$^2$. How fast will the car be moving after it has accelerated for 56 meters?

A) 24 m/s  
B) 20. m/s  
C) 18 m/s  
D) 4.0 m/s

2. Base your answer to the following question on the diagram below which represents a 10-kilogram object at rest at point $A$. The object accelerates uniformly from point $A$ to point $B$ in 4 seconds, attaining a maximum speed of 10 meters per second at point $B$. The object then moves up the incline. [Neglect friction.]

![Diagram of object accelerating from $A$ to $B$.]

What distance did the object travel in moving from point $A$ to point $B$?

A) 2.5 m  
B) 10. m  
C) 20. m  
D) 100 m

3. A jogger accelerates at a constant rate as she travels 5.0 meters along a straight track from point $A$ to point $B$, as shown in the diagram below.

![Diagram of jogger accelerating from $A$ to $B$.]

If her speed was 2.0 meters per second at point $A$ and will be 3.0 meters per second at point $B$, how long will it take her to go from $A$ to $B$?

A) 1.0 s  
B) 2.0 s  
C) 3.3 s  
D) 4.2 s

4. A race car starting from rest accelerates uniformly at a rate of 4.90 meters per second$^2$. What is the car’s speed after it has traveled 200. meters?

A) 1960 m/s  
B) 62.6 m/s  
C) 44.3 m/s  
D) 31.3 m/s

5. A car accelerates uniformly from rest at 3.2 m/s$^2$. When the car has traveled a distance of 40. meters, its speed will be

A) 8.0 m/s  
B) 12.5 m/s  
C) 16 m/s  
D) 128 m/s

6. A ball starting from rest accelerates uniformly at 5.0 meters per second$^2$ as it rolls 40. meters down an incline. How much time is required for the ball to roll the 40. meters?

A) 2.8 s  
B) 8.0 s  
C) 16 s  
D) 4.0 s

7. An airplane originally at rest on a runway accelerates uniformly at 6.0 meters per second$^2$ for 12 seconds. During this 12-second interval, the airplane travels a distance of approximately

A) 72 m  
B) 220 m  
C) 430 m  
D) 860 m

8. Base your answer to the following question on the information below:

A 10.-kilogram object, starting from rest, slides down a frictionless incline with a constant acceleration of 2.0 m/sec$^2$ for four seconds. During the 4.0 seconds, the object moves a total distance of

A) 32 m  
B) 16 m  
C) 8.0 m  
D) 4.0 m

9. A boat initially traveling at 10. meters per second accelerates uniformly at the rate of 5.0 meters per second$^2$ for 10. seconds. How far does the boat travel during this time?

A) 50. m  
B) 250 m  
C) 350 m  
D) 500 m
10. A truck with an initial speed of 12 meters per second accelerates uniformly at 2.0 meters per second\(^2\) for 3.0 seconds. What is the total distance traveled by the truck during this 3.0-second interval?

A) 9.0 m  B) 25 m  C) 36 m  D) 45 m

11. A 25-newton weight falls freely from rest from the roof of a building. What is the total distance the weight falls in the first 1.0 second?

A) 19.6 m  B) 9.8 m  C) 4.9 m  D) 2.5 m

12. An object is allowed to fall freely near the surface of a planet. The object has an acceleration due to gravity of 24 m/s\(^2\). How far will the object fall during the first second?

A) 24 meters  B) 12 meters  C) 9.8 meters  D) 4.9 meters

13. Starting from rest, object \(A\) falls freely for 2.0 seconds, and object \(B\) falls freely for 4.0 seconds. Compared with object \(A\), object \(B\) falls

A) one-half as far  B) twice as far  C) three times as far  D) four times as far

14. An astronaut standing on a platform on the Moon drops a hammer. If the hammer falls 6.0 meters vertically in 2.7 seconds, what is its acceleration?

A) 1.6 m/s\(^2\)  B) 2.2 m/s\(^2\)  C) 4.4 m/s\(^2\)  D) 9.8 m/s\(^2\)

15. A ball is thrown horizontally at a speed of 24 meters per second from the top of a cliff. If the ball hits the ground 4.0 seconds later, approximately how high is the cliff?

A) 6.0 m  B) 39 m  C) 78 m  D) 96 m

16. The graph below represents the relationship between distance and time for an object moving in a straight line. According to the graph, the object is

A) motionless  B) moving at a constant speed  C) decelerating  D) accelerating

17. The displacement-time graph below represents the motion of a cart initially moving forward along a straight line.

During which interval is the cart moving forward at constant speed?

A) \(AB\)  B) \(BC\)  C) \(CD\)  D) \(DE\)

18. The graph below represents the motion of an object traveling in a straight line as a function of time. What is the average speed of the object during the first four seconds?

A) 1 m/s  B) 2 m/s  C) 0.5 m/s  D) 0 m/s
19. Which graph best represents the relationship between acceleration due to gravity and mass for objects near the surface of Earth? [Neglect air resistance.]

A) 

B) 

C) 

D) 

20. Base your answer to the following question on the graph below which represents the displacement of an object as a function of time.

How far is the object from the starting point at the end of 3 seconds?

A) 0 m  B) 2.0 m  C) 3.0 m  D) 9.0 m

21. Base your answer to the following question on the graph below, which represents the motion of cars A and B on a straight track. Car B passes car A at the same instant that car A starts from rest at t = 0 seconds.

Which distance-time graph best represents the motion of car B during the time interval between t = 0 and t = 60?

A) 

B) 

C) 

D)
22. Base your answer to the following question on the graph below which represents the relationship between velocity and time for a 2.0-kilogram cart that is initially at rest and starts moving northward.

At which value of t will the cart be back at the starting point?

A) t = 2.5 s  B) t = 8.5 s  
C) t = 3 s  D) t = 5 s

23. A student throws a baseball vertically upward and then catches it. If vertically upward is considered to be the positive direction, which graph best represents the relationship between velocity and time for the baseball? [Neglect friction.]

A)  

B)  

C)  

D)  
24. Base your answer to the following question on the accompanying graph which represents the motions of four cars on a straight road.

Which graph best represents the relationship between distance and time for car C?

A) ![Graph A]

B) ![Graph B]

C) ![Graph C]

D) ![Graph D]

25. The graph below shows the speed of an object plotted against the time.

The total distance traveled by the object during the first 4 seconds is

A) 0.5 meter  
B) 2 meters  
C) 8 meters  
D) 4 meters

26. The graph below shows speed as a function of time for four cars A, B, C, and D, in straight-line motion.

Which car experienced the greatest average acceleration during this 6.0-second interval?

A) car A  
B) car B  
C) car C  
D) car D
27. The graph below represents the relationship between speed and time for a car moving in a straight line.

The magnitude of the car's acceleration is

A) 1.0 m/s²  
B) 0.10 m/s²  
C) 10 m/s²  
D) 0.0 m/s²

28. Base your answer to the following question on the graph below which represents the relationship between speed and time for an object in motion along a straight line.

During which interval is the object's acceleration the greatest?

A) AB  
B) CD  
C) DE  
D) EF
29. The speed-time graph shown on the right represents the motion of an object.

![Speed-Time Graph]

Which graph best represents the relationship between acceleration and time for this object?

A)  

B)  

C)  

D)  

30. The diagram below represents the relationship between velocity and time of travel for four cars, A, B, C, and D, in straight-line motion.

![Velocity-Time Graph]

Which car has the greatest acceleration during the time interval 10. seconds to 15 seconds?

A)  

B)  

C)  

D)  

31. A baseball pitcher throws a fastball at 42 meters per second. If the batter is 18 meters from the pitcher, approximately how much time does it take for the ball to reach the batter?

A) 1.9 s  

B) 2.3 s  

C) 0.86 s  

D) 0.43 s

32. If a car is traveling at an average speed of 60 kilometers per hour, how long does it take to travel 12 kilometers?

A) 0.2 hour  

B) 0.5 hour  

C) 0.72 hour  

D) 5.0 hours

33. What is the average speed of an object that travels 6.00 meters north in 2.00 seconds and then travels 3.00 meters east in 1.00 second?

A) 9.00 m/s  

B) 0.333 m/s  

C) 3.00 m/s  

D) 4.24 m/s

34. A baseball player runs 27.4 meters from the batter's box to first base, overruns first base by 3.0 meters, and then returns to first base. Compared to the total distance traveled by the player, the magnitude of the player's total displacement from the batter's box is

A) 3.0 m shorter  

B) 6.0 m shorter  

C) 3.0 m longer  

D) 6.0 m longer

35. The average velocity of an object during 6.0 seconds is 2 meters per second. What is the total distance traveled by the object?

A) 1/3 m  

B) 12 m  

C) 3 m  

D) 4 m
<p>| | | | | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>D</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>D</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>D</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>D</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>D</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>D</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>D</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>D</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>D</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>D</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>33</td>
<td>C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>34</td>
<td>B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>35</td>
<td>B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>