College of Arts and Sciences
Department of Physics
Physics Placement Test

90 Minutes Exam

This test has 25 multiple-choice questions. It is provided as a sample for the computerized physics placement test.

1) 0.00325×10^{-8} cm can also be expressed in mm as
A) 3.25×10^{-12} mm.
B) 3.25×10^{-11} mm.
C) 3.25×10^{-10} mm.
D) 3.25×10^{-9} mm.

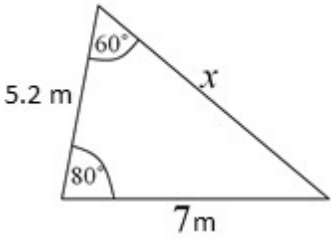
2) The number of significant figures in 0.040 is
A) one.
B) two.
C) three.
D) four.

3) A rectangle is 3.25 m long and 1.5 m wide. Its area using proper significant figures is
A) 4.875 m^2
B) 4.87 m^2
C) 4.80 m^2
D) 4.9 m^2

4) A train slowly climbs a 500-m mountain track which is at an angle of 10° with respect to the horizontal. How much altitude (height) does it gain?
A) 86.8 m.
B) 88.2 m.
C) 341 m.
D) 492.4 m.

5) While analyzing the motion of a particle a student obtains the equation $4.9t^2-24.5t = -19.6$, where t is the time in seconds. The values of t that satisfy the equation are:
A) 4 and 2
B) 4 and 1
C) 8 and 1
D) 8 and 2

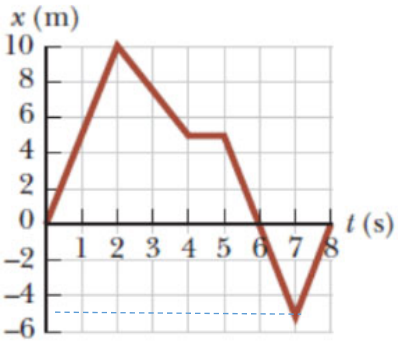
6) Find the length of *x* in the triangle shown:
A) 5.86 m
B) 7.96 m
C) 8.72 m
D) 5.2 m



7) A motorist travels for 3.0 h at 80 km/h and 2.0 h at 100 km/h. What is her average speed for the trip?
A) 85 km/h
B) 88 km/h
C) 90 km/h
D) 92 km/h

8) The position versus time for a certain particle moving along the *x* axis is shown in the figure. The average velocity during the time interval 2 s to 7 s is:

A) -3.0 m/s
B) 1.0 m/s
C) -5.0 m/s
D) 3.0 m/s



9) A car traveling 60 km/h accelerates at the rate of 2.0 m/s^2. How much time is required for the car to reach a speed of 90 km/h?
A) 15 s
B) 30 s
C) 45 s
D) 4.2 s

10) A cart with an initial velocity of 5.0 m/s experiences a constant acceleration of 2.0 m/s^2. What is the cart's displacement during the first 6.0 s of its motion?
A) 10 m
B) 55 m
C) 66 m
D) 80 m

11) A car goes from 40 m/s to 80 m/s in a distance of 200 m. What is its average acceleration?
A) 8.0 m/s^2
B) 9.6 m/s^2
C) 12 m/s^2
D) 24 m/s^2

12) A ball is thrown straight up with a speed of 36.0 m/s. How long does it take to return to its starting point?
A) 3.67 s
B) 7.35 s
C) 11.0 s
D) 14.7 s

13) Vector **A** has magnitude 8.0 m at an angle of 30^o below the +*x* axis. The y-component of **A** is
A) 6.9 m.
B) -6.9 m.
C) 4.0 m.
D) -4.0 m.

14) The components of vector $\vec{A}$ are A_x = + 3.90 and A_y = -4.00. What is the angle measured

counterclockwise from the +x-axis to vector $\vec{A}$?
A) 314°
B) 134°
C) 224°
D) 136°

15) Vector $\vec{A}$ has a magnitude 5.00 and points in a direction 40.0° clockwise from the negative *y* axis. What are the *x* and *y* components of vector $\vec{A}$.
A) A_X = 3.83 and A_Y = 3.21
B) A_X = 3.83 and A_Y = -3.21
C) A_X = -3.21 and A_Y = -3.83
D) A_X = -3.21 and A_Y = 3.83

16) The components of vector $\vec{A}$ are A_x = +2.2 and A_y = -6.9, and the components of vector $\vec{B}$ are given are B_x = -6.1 and B_y = -2.2. What is the magnitude of the vector $\vec{B}$ - $\vec{A}$?
A) 9.5
B) 6.1
C) 9.9
D) 91

17) You walk 55 m to the north, then turn 60° to your right and walk another 45 m. How far are you from where you originally started?
A) 87 m
B) 50 m
C) 94 m
D) 46 m

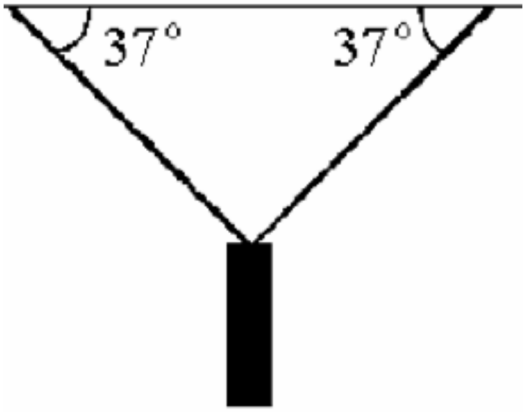
18) A 40 kg box is being raised by means of a rope. Its upward acceleration is 2 m/s^2. What is the force exerted by the rope on the box?
A) 392 N
B) 312 N
C) 472 N
D) 552 N

19) A student pulls a box of books on a smooth horizontal floor with a force of 100 N in a direction of 37^o above the horizontal. If the mass of the box and the books is 40.0 kg, what is the acceleration of the box?
A) 1.5 m/s^2
B) 1.9 m/s^2
C) 2.0 m/s^2
D) 3.3 m/s^2

20) A student pulls a box of books on a smooth horizontal floor with a force of 100 N in a direction of 37° above the horizontal. If the mass of the box and the books is 40.0 kg, what is the normal force on the box?
A) 292 N
B) 312 N
C) 332 N
D) 392 N

21) A 10-kg box sitting on a horizontal surface is pulled by a 5.0-N force. A 3.0-N friction force retards the motion. What is the acceleration of the object?
A) 0.20 m/s^2
B) 0.30 m/s^2
C) 0.50 m/s^2
D) 5.0 m/s^2

22) A traffic light is supported by two ropes as shown in figure. If the tension force in each rope is 50 N, what is the mass of the traffic light?



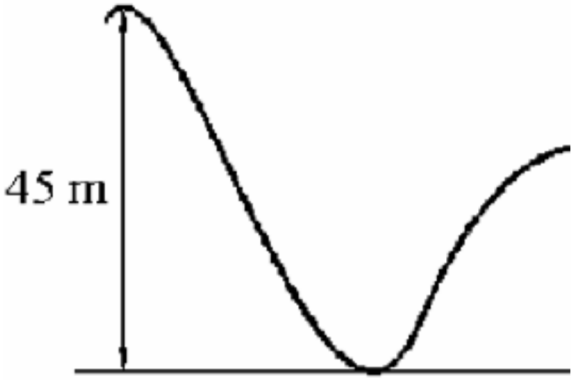
A) 3.1 kg
B) 4.1 kg
C) 6.1 kg
D) 8.1 kg

23) A 500-kg elevator is pulled upward with a constant force of 5500 N for a distance of 50.0 m. What is the work done by the 5500 N force?
A) 2.75×10^5 J
B) -2.45×10^5 J
C) 3.00×10^4 J
D) -5.20×10^5 J

24) Ali pulls his little sister Sarah in a sled on an icy surface (assume no friction), with a force of 60.0 N at an angle of 37° upward from the horizontal. If he pulls her a distance of 12.0 m, what is the work done by Ali?
A) 185 J
B) 433 J
C) 575 J

D) 720 J

25) A roller coaster starts from rest at a point 45 m above the bottom of a dip (See Figure). Neglect friction, what will be the speed of the roller coaster at the bottom of the dip?



A) 29.7 m/s
B) 17 m/s
C) 24 m/s
D) 882 m/s

Answers

1. C
2. B
3. D
4. A
5. B
6. B
7. B
8. A
9. D
10. C
11. C
12. B
13. D
14. A
15. C
16. A
17. A
18. C
19. C
20. C
21. A
22. C
23. A
24. C
25. A