csd2300s24-csd2301s24-meta.sg

Started on	Thursday, 1 February 2024, 9:10 AM
State	Finished
Completed on	Thursday, 1 February 2024, 10:10 AM
Time taken	59 mins 46 secs
Grade	**3.00** out of 10.00 (**30**%)

Question **1**
Incorrect
Mark 0.00 out of 1.00
Flag question

A ball is thrown straight up. Which of the following statements about its velocity and acceleration is true during its flight (ignoring air resistance)?

i. The velocity is always in the same direction as the acceleration.

ii. The acceleration is always directed upward.

iii. The acceleration is always directed downward.

iv. The velocity is zero at the highest point.

Select one:

a. (ii) and (iv) only

when ball is going up, velocity points up while accelration points down

b. (i) and (iii) only

c. (iv) only

d. (i), (iii) and (iv) only ✗

e. (iii) and (iv) only

Question **2**
Incorrect
Mark 0.00 out of 1.00
Flag question

The velocity v, in metres per second, of an object is given by the equation $v = A + Bt^{-3} + Ct^2$, where t represents time in seconds. What are the SI units of A, B and C, respectively?

Select one:

a. none of the above ✗

b. m/s, m/s², ms³

c. m/s, m/s², ms

d. m/s, ms², m/s³

both side of the equation needs to have the same dimension. So each term need to have the units of m/s

e. m/s, ms³, m/s²

Question **3**
Correct
Mark 1.00 out of 1.00
Flag question

A sports car accelerates uniformly along a track for 400 meters from rest and reaches the end of the track in 9.25 seconds. What is its speed, in m/s, when it reaches the end of the track?

Select one:

a. 80.7

b. 39.4

c. 75.9

d. 66.8

e. 86.5 ✓

Question **4**
Correct
Mark 1.00 out of 1.00
Flag question

An MRT train starts from rest at Clementi station and moves towards Dover station with a constant acceleration of 1.7 m/s² for 15 s. It then moves at constant speed for 50 s and slows down at a rate of 3.5 m/s² until it stops at Dover station. Find the total distance travelled in metres, accurate to 1 decimal place.

Select one:

a. 1774

b. 1668

c. 1814

d. 1931

e. 1559 ✓

Question **5**
Incorrect
Mark 0.00 out of 1.00
Remove flag

A drone is undergoing uniform circular motion with a diameter of 20 meters. If the drone's centripetal acceleration is 5 m/s², how long does it take for the drone to complete one full circle?

Select one:

a. 12.6 s ✗

b. 25.5 s

c. 8.89 s

d. 17.1 s

e. 102 s

Question **6**
Correct
Mark 1.00 out of 1.00
Remove flag

A stunt motorcyclist with a total mass of 200 kg, attempts to jump across a canyon for a movie scene. The takeoff ramp is located 250 m above the canyon floor, while the landing ramp is 235 m above the canyon floor. The canyon is 50 meters wide. What minimum speed must the motorcyclist have at the moment of leaving the takeoff ramp to successfully reach the landing ramp? Neglect friction and air resistance. Assume the motorcyclist leaves the takeoff ramp horizontally.

Select one:

a. 13.7 m/s

b. 20.2 m/s

c. 24.1 m/s

d. 31.1 m/s

e. 28.6 m/s ✓

Question **7**
Incorrect
Mark 0.00 out of 1.00
Remove flag

A soccer player threw a ball with a velocity of 11 m/s at an angle of 33 degrees above the horizontal. Ignore air resistance. How far did the ball travel horizontally?

Select one:

a. 15.4 m ✗

b. 19.0 m

c. 23.9 m

d. 27.6 m

e. 11.3 m

Question **8**
Incorrect
Mark 0.00 out of 1.00
Remove flag

An archer is situated 40.0 m away from a castle wall that is 30.0 m tall. He shoots an arrow at an angle of 39.0° above the horizontal. To clear the top of the wall, what must be the minimum initial velocity of the arrow? Ignore air resistance.

Select one:

a. 66.7 m/s

b. 73.7 m/s

c. 33.7 m/s

d. 59.2 m/s

e. 46.0 m/s ✗

Question **9**
Incorrect
Mark 0.00 out of 1.00
Flag question

A mischievous boy is on the highest storey of his house. He is at a height of *h* from the ground. Hoping that he can litter on the streets outside his compound, the boy hurls a ball of rubbish horizontally outwards with a speed *v*. Unfortunately, a gust of wind in a direction parallel to the ground provides the ball of rubbish a constant horizontal acceleration backward with a magnitude of *a*. As a result, the ball of rubbish landed on the ground directly below him. Ignoring vertical air resistance, what is the height *h* in terms of *v*, *a* and *g*?

Select one:

a. $2vg/a$

b. v^2g/a^2

c. v^2/a^2g ✗

d. $2v^2g/a^2$

e. $2v^2g^2/a$

Question **10**
Incorrect
Mark 0.00 out of 1.00
Flag question

A basketball is thrown off a platform horizontally at a height of 0.950 m above the ground. It reaches the ground at a point 1.90 m horizontally from the edge of the platform. Ignoring air resistance, what is the direction of the ball's velocity just before hitting the ground?

Select one:

a. 47.5˚ below the horizontal

b. 43.4˚ above the horizontal ✗

c. 41.1˚ above the horizontal

d. 42.6˚ below the horizontal

e. 45.0˚ below the horizontal

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