

Training test

Started Sunday, March 15 2020, 5:10 pm

State Completed

terminated Sunday, March 15 2020, 5:35 pm

The time spent on 25 min 11 seconds

Score 575,00 / 1200,00

Rating 5.75 out of a maximum of 12.00 (48 %)

Question 1

Correct answer

Score 100.00 out of 100.00

An object moves in a uniformly accelerated rectilinear motion with acceleration a for a time $t = 5 \text{ s}$, covering a distance $d = 8 \text{ m}$. If its initial velocity is $v_0 = 2 \text{ m/s}$, which of the following statements is correct?

- (A) a has the same verse as v_0 , $v_f = 0$
- (B) a has the same direction of v_0 , v_f opposite
- (C) a has opposite verse v_0 , $v_f = 0$
- (D) a has opposite verse v_0 ; the final speed v_f has the same direction as v_0 ✓
- (E) a and v_f have the same verse of v_0

The correct answer is: a has opposite verse v_0 ; the final speed v_f has the same direction as v_0

Question 2

Correct answer

Score 100.00 out of 100.00

2 vectors are given and in the plane, of modules $|\vec{a}| = 5$ and $|\vec{b}| = 5$. How much is the modulus of their vector difference $|\vec{a} - \vec{b}|$ - knowing that the angle between the vectors \vec{a} and \vec{b} is 60° ?

- (a) none of the other answers are correct
- (b) 15
- (c) 50
- (d) 5 ✓
- (e) 25

Correct answer.

The correct answer is: 5

Question 3

Correct answer

Score 100.00 out of 100.00

A centrifuge used to train astronauts rotates at a constant angular speed of 2 rad/s . Internally, the staff in training bears a centripetal acceleration equal to 4 times that due to gravity. How long is the centrifuge arm? Consider $g = 10 \text{ m/s}^2$

- (a) 10 m ✓
- (b) 2.5 m
- (c) It cannot be calculated if the mass of the centrifuge is unknown
- (d) 1 m
- (e) 20 m

Correct answer.

The correct answer is: 10 m

Question 4

Wrong answer

Score -25.00 out of 100.00

The elastic forces of two springs, elongated by x_1 and x_2 respectively, have the same intensity. If $\frac{x_1}{x_2} = \frac{2}{3}$, how much is the ratio $\frac{k_1}{k_2}$ of elastic constants?

- (A) 1/2
- (B) 2/3 ✗
- (C) 1/4
- (D) 3/2
- (E) 4/3

The correct answer is: 3/2

Question 5

Correct answer

Score 100.00 out of 100.00

Two tungsten wires have the same mass. Wire A is as long as wire B. Their resistances, R_A and R_B , are linked by

- (a) $R_A = 2R_B$
- (b) $R_A = R_B$ ✓
- (c) $R_A = 10R_B$
- (d) $R_B = 10R_A$
- (e) $R_B = 2R_A$

Correct answer.

The correct answer is: $R_A = R_B$

Question 6

Correct answer

Score 100.00 out of 100.00

The efficiency of a thermal machine that completes a Carnot cycle is equal to 0.8. Knowing that it absorbs heat from a hot source that is at the temperature $T_C = 1000$ K, at what temperature T_F is a cold source?

- (a) 360 K
- (b) 200 K ✓
- (c) 400 K
- (d) 250 K
- (e) 800 K

Correct answer.

The correct answer is: 200K

Question 7

Correct answer

Score 100.00 out of 100.00

A copper block of mass $m = 20$ g is found in the laboratory at an initial temperature t . At block there is provided a heat equal to $Q = 84$ J thanks to which reaches the final temperature $T_{fin} = 35$ ° C. Knowing that the specific heat c_{cu} of the copper can be approximated to 0.1 cal / g ° C and using the approximation 1 cal = 4.2 J, determine the value of the initial temperature t_{in} .

- (a) 390 K
- (b) none of the other answers are correct
- (c) 25 ° C ✓
- (d) 2.5 ° C
- (e) 250 ° C

Correct answer.

The correct answer is: 25 ° C

Question 8

Correct answer

Score 100.00 out of 100.00

A mass body m slides along a smooth plane inclined at an angle θ from the horizontal. What can be said about its acceleration?

- (A) which is parallel to the plane and is valid in module $g \cos \theta$
- (B) which is parallel to the plane and is valid in module g
- (C) which is parallel to the plane and is valid in module $g \sin \theta$ ✓
- (D) which is vertical, directed downwards and has modulus $g = 9.8 \text{ m/s}^2$
- (E) which has a component parallel to the plane and one perpendicular to the plane

The correct answer is: that it is parallel to the plane and is valid in form $g \sin \theta$

Question 9

Wrong answer

Score -25.00 out of
100.00

In the International System, a vector quantity is measured in $\text{kg m}^2/\text{s}^2$. What size could it be?

- (A) Entropy
- (B) Momentum ✘
- (C) Moment of momentum
- (D) Impulse of a force
- (E) Moment of a force

The correct answer is: Moment of a force

Question 10

Wrong answer

Score -25.00 out of
100.00

A liquid in stationary motion flows in a horizontal tube. If at a certain point in the tube its diameter increases, what effects can be observed on the flow of liquid?

- (a) In the absence of sufficient information on the pressure value, it is not possible to answer
- (b) In the section of pipe with a larger diameter, the speed of the liquid decreases and the flow rate remains constant
- (c) In the section of pipe with a larger diameter, the speed of the liquid increases and the flow rate remains constant
- (d) In the section of pipe with a larger diameter, the flow rate and speed of the liquid remain unchanged
- (e) In the section of pipe with a larger diameter, the flow rate decreases and the speed of the liquid increases ✘

Wrong answer.

The correct answer is: In the section of pipe with a larger diameter, the speed of the liquid decreases and the flow rate remains constant

Question 11

Wrong answer

Score -25.00 out of 100.00

A spherical surface contains three charges $q_1 = 4q$, $q_2 = 5q$, $q_3 = -7q$. A fourth charge $q_4 = -5q$ is placed outside the sphere.¹ How much is the flow of the electric field through the spherical surface worth? Let ϵ_0 the dielectric constant of the vacuum.

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- (a) $16q / \epsilon_0$
 - (b) $2q / \epsilon_0$
 - (c) $-3q / \epsilon_0$
 - (d) is null
 - (e) it cannot be determined because the exact position of the charges within the spherical surface is unknown ✖

Wrong answer.

The correct answer is: $2q / \epsilon_0$ **Question 12**

Wrong answer

Score -25.00 out of 100.00

To a point body of mass $m = 1 \text{ kg}$, in motion with speed $v = 20 \text{ m/s}$, a force is applied which decreases its speed up to 10 m/s . If no other forces act on the body, it can be said that:

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- (a) the work of force is nil.
 - (b) None of the other answers are correct ✖
 - (c) Nothing can be said without knowing how long the force acts.
 - (d) the work of the force is equal to -150 J .
 - (e) the work of the force is equal to 150 J .

Wrong answer.

The correct answer is: the work of strength is equal to -150 J .