St John Baptist De La Salle Catholic School, Addis Ababa

Grade 11 ESSLCE Physics Prep Questions

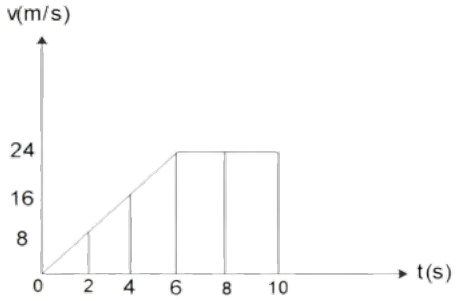
2nd Quarter

The latex group

December, 2023

Multiple Choice Questions

1. The diagram shown below is a velocity-time graph for a car moving in a straight line. What is the displacement of the car after 10s?



A. 96m B. 72m C. 240m D. 168m

2. If a stone is thrown directly downward from the top of a 40m tall building with an initial speed of 10m/s. What will be the speed of the stone when it reaches the ground?($g = 10m/s^2$, air resistance is negligible)
A. 40m/s B. 30m/s C. 90m/s D. 50m/s

3. Which of the following statement is correct?

   A. It is not necessary to consider a reference frame to measure velocity.
   B. There is a universal reference frame
   C. Velocity is always measured relative to a reference frame.
   D. Velocity is independent of a reference frame.

4. Consider a particle performing a circular motion around a circle of radius r, with an angular velocity ω and the particle's projection on the horizontal diameter of the circle (between points Q and R) as shown in the figure below

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Which of the following statements is correct about the motion of the particle and its projection on $\overline{QR}$

A. The projection of the particle on $\overline{QR}$ swings between points Q and R with constant speed.

B. The circular motion of particle can be taken as a simple harmonic motion.

C. The projection of the particle on $\overline{QR}$ demonstrates simple harmonic motion.

D. The projection of the particle on $\overline{QR}$ demonstrates motionwith constant acceleration.

5. Which one of the following groups of physical quantities contains only vectors?

A. Work, Electric field, Displacement and Force

B. Acceleration, Speed, Force and Electric field

C. Momentum, Energy, Magnetic field and Force

D. Displacement, Velocity, Magnetic field and Momentum

6. Which rule about the number of significant figures is correct? Zeros in the number

A. 450.0 are significant figures.

B. 0.0023 are significant figures.

C. 1.1000 are significant figures.

D. 2.70018 are significant figures.

7. Given two vectors $v_1 = 10units$ aling the positive y-axisand $v_2 = 6units$ at an angle of 37° above the positive x-axis. What is the scalar product of the vectors in square of units?
A. 45 B. 36 C. 48 D. 60

8. An airplane takes-off at airport A and travels 500km due east within one hour and then turning to south it flies for 20 minutes to land on airport B which is 100km away from turning point. The magnitude average velocity of the plane during its flight between two airports is
A. $75\sqrt{24}$ km/hr B. $100\sqrt{34}$ km/hr C. 450 km/hr D. $75\sqrt{26}$ km/hr

9. A bullet is fired with an initial speed v at an angle θ with the horizontal. It takes a time T to reach its maximum vertical displacement $h_{\max}$. It hits the target point a distance R away and exactly in the horizontal level to the point where it was fired. Which one of the following statement is **NOT** correct about the motion of bullet?

A. The bullet hits the target at a time 2T after it was fired.

B. $h_{\max}$ is directly proportional to the initial speed v.

C. R will be maximum if $\cos\theta=\sqrt{2}/2$.

D. θ should be different from 90° to hit the target at a distance R.

10. A man pushes a 25.0kg object by 250N force along an inclined plane inclined at an angle of 37° to the horizontal. If the object moves with constant speed, the friction force exerted on the block is

A. 250.0 N, up the inclined plane.

B. 100.0 N, up the inclined plane.

C. 100.0 N, down the inclined plane.

D. 250.0 N, down the inclined plane.

11. The following three collisions occur in different systems.

I A billiard ball A collides with an identical ball B and comes to rest after collision, while ball B moves with the same velocity as ball A was moving before.

II A bullet moving with speed v hits a suspended mass and it embedded in it and the combination moves with common velocity.

III Two cars moving in opposite direction become at rest after collision.
Which of the following statements is correct about these collisions?

A. II and III are inelastic collisons.

B. I and II are elastic collisons.

C. I, II and III are inelastic collisions.

D. I and III are elastic collisions.

12. An object of mass M is attached to a spring of spring constant K, as shown in figure below.

If the mass is pulled to a point P, which is the distance Afrom equilibrium position O, and released. Which one of the following statements is correct about energy of the system?(assume the surface

A. At point O, the system has both kinetic and potential energy.

B. At point P, the systemm has both kinetic and potential energy.

C. At point P, the mass attain its maximum velocity.

D. At point Q the system has both kinetic energy and potential energy.

13. A force $\vec{F} = (\hat{i} - 3\hat{k})$ N acts on a wooden bar and drags the bar through a displacement of $\vec{r} = 4 - \hat{i}m$. WHat is the torque due to the force N.m?
A. $4\hat{i} + 12\hat{j}$ B. $-12\hat{j}$ C. $12\hat{j}$ D. $12\hat{k}$

14. Consider a system of two point masses M_1 and M_2 with $M_1 = 0.5\ M_2$. The two masses are located on the x-y plane as shown in the figure below.

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Which one of the following alternatives indicates the position of center of mass of the systems?
A. (5/3,7/3)cm B. (5,4)cm C. (11/3,16/3)cm D. (16/3,11/3)cm

15. Which one of the following is correct about mechanica waves?

A. The number of complete waves passes a given point per time is called the period of teh waves.

B. The distance between two identical points on adjacent points on adjacent waves is known as the wavelength of the wave.

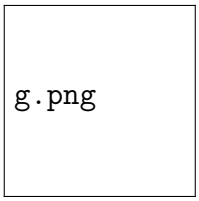
C. The time taekn for one complete wave to pass a given point is called the frequency of the wave.

D. The maximum height in a transverse wave is known as the trough of the wave.

16. A boy in a journey covers his route by traveling 3.0 km east and 4.0 north. What is teh magnitude of his resultant displacemnt?

Which one of the following alternatives indicates the position of center of mass of the systems?
A. 2.7km B. 7.0km C. 1.0km D. 5.0km

17. The graph below shows the velocity of a man travelling on a motorcycle as a function of time



Which one of the following statements is correct aabout the velocity-time graph?

A. The acceleration in the first 6 is equal to the gradient of the curve in the given interval and it is positive.

B. The acceleration during the time interval from $t = 6s$ to $t = 10s$ is equal to the gradient of the curve in the given interval and it is negative.

C. The dispacement during te time intervals $t = 0s$ to $t = 6s$ is equal to the area under the velocity-time graph in the given interval

D. The displacement during the time. interval from $t = 6s$ to $t = 14s$ is equal to the area of region II minus the area of region III.