



Time Academy

2012 E.C Physics Model Exam for Grade 12

Name _____ Section _____ Roll no _____

Direction One:- There are four alternative words, A- D given below each question. Choose the alternative that best completes the sentence and blacken the letter of your choice on the separate answer sheet provided.

_____1. Refraction of wave does not involve change in its

- A. speed B. wave length C. frequency D. speed and wave length

_____2. Which of the following expression stands for the KE of simple harmonic motion?

- A. $E_K = \text{total energy} - PE$ B. $E_K = \frac{1}{2}KA^2$ C. $E_K = \frac{1}{2}KA$ D. $E_K = \frac{1}{2}Kx^2$

_____3. The angular difference in timing between two waves is given by:-

- A. phase difference B. path difference C. phase angle D. critical angle

_____4. The point where two superimposed waves are in antiphase and there is no oscillation is:-

- A. Amplitude B. node C. antinode D. equilibrium position

_____5. The resultant wave equation of standing wave can be expressed as:-

- A. $Y = 2y_0 \cos(wt) \sin(kx)$ C. $Y = y_0 \cos(wt) \sin(kx)$
B. $Y = y_0 \sin(wt)$ D. $Y = \frac{y_0}{2} \cos 9wt \sin(kx)$

_____6. The speed of sound is inversely proportional with

- A. density of the liquid C. young modulus of fluid
B. bulk modulus of the fluid D. density of the media in which it travels

_____7. Which of the following the thermodynamical process is linked with their correspondent constant quantity/

- A. Isochoric – volume C. Isothermal –pressure
B. Adiabatic- temperature D. Isobaric- heat

_____8. A heat engine is being designed to have a Carnot efficiency of 65% when operating between two energy reservoirs. If the temperature of cold reservoir is 20°C . What must be the temperature of the hot reservoir?

- A. 57°C B. 310°C C. 564°C D. 807°C

_____9. Under steady state the temperature of a body?

- A. increases with time B. decreases with time
C. does not change with time D. does change with time depending on external factor.

- _____10. An ideal gas is at a temperature of 300k. If we wish to double the root mean square speed of the molecule of the gas to what value must be the temperature of the gas it raised?
- A. 450k B. 600k C. 800k D. 1200k
- _____11. In young's double slit experiment both separation between the slit and the distance between the slit and the screen are halved then the fringe width would be:-
- A. halved B. unchanged C. zero D. double
- _____12. A transversal sinusoidal wave is travelling on a string which statement is correct about a point on a string?
- A. the point moves in the same direction as the wave
- B. the point moves in simple harmonic with different frequency than that of the wave
- C. the point moves in simple harmonic motion with the same angular frequency as the wave
- D. the point moves in uniform circular motion with a different angular speed than the wave
- _____13. The amount of heat required to raise the temperature of an object of mass of 1kg by 1k is
- A. specific heat capacity C. expansion of coefficient
- B. heat capacity D. internal energy
- _____14. Two non-zero vectors D and E have princely equal magnitudes. For magnitude of D-E to be three times the magnitude of D-E what must be the angle between vector D and E
- A. 30° B. 37° C. 53° D. 60°
- _____15. A car travels along a straight line at a constant speed of 20m/s for a distance 'd' and another distance 'd' in the same direction at a constant speed of 36km/hr what is the average speed for entire trip?
- A. 23km/hr B. 48km/hr C. 54km/hr D. 60km/hr
- _____16. A flywheel is rotating with an angular velocity of 4.2 rad/s A force accelerates it uniformly at an angular velocity of 10.6rad/s over 4 seconds.
- A. 1.6 rad/S^2 B. 0.8 rad /S^2 C. 2.4 rad/S^2 D. 4.8 rad/S^2
- _____17. Car 'A' collides with car 'B' which is at stationary and then both cars move together. Before collision, car 'A' had a velocity of 5m/s. If the mass car 'A' and car 'B' are respectively 1250kg and 1500kg respectively, the speed at which the two cars move after collision would be:-
- A. 3.1m/s B. 2.3m/s C. 4.7m/s D. 5.2m/s
- _____18. A 1kg object explodes and breaks up into three pieces, one piece has a mass of 400g and has a velocity of $\begin{bmatrix} 25 \\ -10 \end{bmatrix}$ m/s. What is the velocity of the third piece?
- A. $\begin{bmatrix} -2.5 \\ 4.3 \end{bmatrix} \text{ m/s}$ B. $\begin{bmatrix} -3.5 \\ 4.3 \end{bmatrix} \text{ m/s}$ C. $\begin{bmatrix} -2.5 \\ 10 \end{bmatrix} \text{ m/s}$ D. $\begin{bmatrix} 0 \\ 0 \end{bmatrix} \text{ m/s}$

- _____19. If a long distance jumper athlete leaves the ground at an angle of 37° to have the horizontal surface at a speed of 10m/s, how far does the jumper in the horizontal direction?
- A. 4.8m B. 6m C. 9.6m D. 12m
- _____20. The maximum range is attained by the projectile when the projectile is launched at angle of:
- A. 30° B. 45° C. 53° D. 60°
- _____21 What does the slope of a velocity time graph represent?
- A. Distance B. acceleration C. displacement D. speed
- _____22. The magnitudes of two vectors A and B are 12 unit and 5unit respectively which one of the following is not possible value for the magnitude of the resultant vector A +B?
- A. 60 units B. 17 units C. 13 units D. 70 units
- _____23. Determine the torque due to a force $\vec{F} = (2\hat{i} - 3\hat{j} + 4\hat{k})$ N acting at a point $\vec{r} = 3\hat{i} + 2\hat{j} + 3\hat{k}$ about the origin?
- A. $6\hat{i} - 6\hat{j} + 12\hat{k}$ B. $(6\hat{i} + 6\hat{j} + 12\hat{k})$ C. $17\hat{i} + 6\hat{j} - 13\hat{k}$ D. $17\hat{i} + 6\hat{j} + 13\hat{k}$
- _____24. The area under a force versus distance graph represents
- A. Acceleration B. the change in energy C. the change in momentum D. work done
- _____25. An airplane flies at a speed of 720km/hr at 37° north west direction, How far does the plane travel to the west in 1hr?
- A. 432km B. 720m C. 576km D. 504km
- _____26. An example of a body moving with constant speed but still accelerating is
- A. A body moving on a straight road
- B. A body moving on a straight railway track
- C. A body moving in a circular path
- D. a body falling in a viscous fluid
- _____27. The rotational analogue of mass is
- A. moment of inertia B. torque C. angular momentum D. angular acceleration
- _____28. A body moving with constant acceleration covers, the distance between two points 60m apart in 5 sec. Its velocity as it passes the second is 15m/s what is its acceleration?
- A. 3m/s^2 B. 2.4m/s C. $1.8/\text{s}^2$ D. 1.2m/s^2
- _____29. The quantities remaining constant in an elastic collision are
- A. momentum kinetic energy and temperature
- B. momentum and kinetic energy but not temperature
- C. momentum and temperature but kinetic energy
- D. momentum but neither kinetic energy nor temperature

_____30. A car of mass 1500kg collides with a wall and rebounds the initial and final velocities of the car are 15m/s and 3m/s respectively and if the collision lasts for 0.15sec. the impulse delivered to the car would be:-

- A. -18000kgm/s B. -2700kgm/s C. -12000kgm/s D. Zero

_____31. An empty plastic box of mass 5kg is observed to accelerate up at the rate of $g/6$ when placed deep inside water. What mass of sand should be put inside the box so that it may accelerate down at the rate of $g/6$?

- A. 1kg B. 1.5kg C. 2kg D. 2.5kg

_____32. The internal energy is a unique function of state because it,

- A. does not depend upon path C. corresponds to an adiabatic process
B. depends up on the path D. corresponds to an isothermal process

_____33. A gas is expanded adiabatically at an initial temperature of 300K so that its volume is doubled. The final temperature of the gas is ($\gamma=1.4$)

- A. 227.3K B. 456.76K C. 500.3K D. -47°C

_____34. The equation of SHM of a particle is $a + 4\pi^2 x = 0$ where 'Q' is acceleration at displacement x. the frequency of motion is

- A. 1HZ B. 4π HZ C. $\frac{1}{4}$ D. 4HZ

_____35. The SHM of a particle is given by $Y = 3 \sin \omega t + 4 \cos \omega t$, what is the amplitude of the system?

- A. 1 B. 7 C. 5 D. 12

_____36. The displacement of a particle in SHM is $Y = 10 \sin (6t + \frac{\pi}{2})$. The initial velocity of the particle is

- A. 15m/s B. 10m/s C. 30m/s D. 5m/s

_____37. At what displacement will be kinetic and potential energies of a SHM equal?

- A. $x=4$ B. $x = \frac{A}{2}$ C. $x = \frac{A}{\sqrt{2}}$ D. $x = \frac{A}{\sqrt{3}}$

_____38. A particle executes SHM of amplitudes 5cm and period 3sec what is the velocity of the particle at a distance of 4cm from the mean position? ($\pi = 3.14$)

- A. 8cm/s B. 12cm/s C. 4cm/s D. 6cm/s

_____39. A particle travels at a constant velocity of 3m/s for 20sec it then stops for 10sec before completing its journey in a further 30 sec at a constant velocity of 2m/s. Its average velocity for the whole journey is

- A. 2m/s B. 2.4m/s C. 2.5m/s D. 3m/s

_____40. The flux of electric field attains its maximum value when the angle between the field lines and the surface is

- A. 45° B. 0° C. 60° D. 180°

