PHYSICS

BOOKS - FULL MARKS PHYSICS (TAMIL ENGLISH)

SAMPLE PAPER - 8 (SOLVED)

Part I

1. A new unit of length is chosen such that the speed of light in vscuum is unity. What is the

distance between the sun and the Earth in terms of the new unit if light takes 8 min and 20 s to cover this distance.

A. 100 new unit

B. 300 new unit

C. 500 new unit

D. 700 new unit

Answer:

Watch Video Solution

2. For a satellite moving in an orbit around the earth, the ratio of kinetic energy of potential

A. 2

B. $1:2$

C. $1:\sqrt{2}$

D. $\sqrt{2}$

Answer:

Watch Video Solution

3. In the equilibrium position a body has .....

A. maximum potential energy

B. minimum potential energy

C. minimum kinetic energy

D. neither maximum nor minimum potential energy

Answer:

Watch Video Solution

4. The centrifugal force appears to exist

A. only in inertial frames

B. only in rotating frames

C. in any accelerated frame

D. both in inertial and non-inertial frames

Answer:

Watch Video Solution

5. A particle is moving with a contant velocity along a line parallel to positive X-axis. The magnitude of its angular momentum with respect of the origin is

A. zero

B. increasing with x

C. decreasing with x

D. remaining constant

Answer:

Watch Video Solution

Watch video solution

6. When 8 droplets of water of radius 0.5 mm combine to form a single droplet. The radius of it is .....

A. 4 mm

B. 2 mm

C. 1 mm

D. 8 mm

Answer:

Watch Video Solution

7. Pressure head in Bernoulli's equation is .....

A. $\frac{P\rho}{g}$

B. $\frac{P}{\rho g}$

C. ρg

D. $P\rho g$

Answer:

Watch Video Solution

8. The angle between particle velocity and wave velocity in a transverse wave is .....

A. zero

B. $\pi/4$

C. $\pi/2$

D. π

Answer:

Watch Video Solution

9. If the masses of the Earth and Sun suddenly double, the gravitational force between them will

A. remains the same

B. increase two times

C. increase four times

D. decrease two times

Answer:

Watch Video Solution

10. A mobile phone tower transmits a wave signal of frequency 900 MHz. Calculate the length of the wave transmitted from the mobile phone tower .

A. 0.33 m

B. 300 m

C. 2700×10^8 m

D. 1200 m

Answer:

Watch Video Solution

11. The displacement y of a wave travelling in the x direction is given by $y = \left(2 \times 10^{-3}\right)\sin\left(300t - 2x + \frac{\pi}{4}\right)$, where x and y are measured in metres and t in second. The speed of the wave is

A. 150 ms^{-1}

B. 300 ms^{-1}

C. 450 ms^{-1}

D. 600 ms^{-1}

Answer:

Watch Video Solution

12. The increase in internal energy of a system is equal to the workdone on the system. The process does the system undergoes is .....

A. isochoric

B. adiabatic

C. isobaric

D. isothermal

Answer:

Watch Video Solution

13. What is the minimum velocity with a body of mass m must enter a vertical loop of radius R so that it can complete the loop ?

A. $\sqrt{2gR}$

B. $\sqrt{3gR}$

C. $\sqrt{5gR}$

D. $\sqrt{gR}$

Answer:

Watch Video Solution

14. If the rms velocity of the molecules of a gas in a container be doubled then the pressure of the gas will.

A. becomes 4 times of the previous value

B. becomes 2 times of its previous value

C. remains same

D. becomes $\frac{1}{4}$ of its previous value

Answer:

Watch Video Solution

15. Gravitational mass is proportional to gravitational.....

A. intensity

B. force

C. field

D. all of these

Answer:

Watch Video Solution

Part Ii

1. Write down the postulates of kinetic theory of gases.

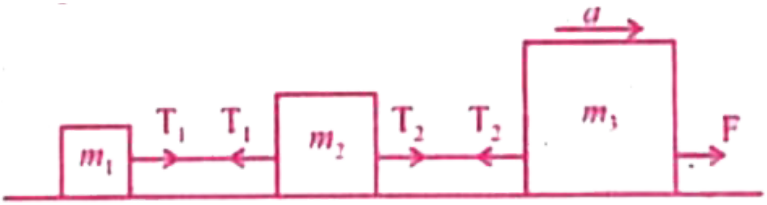
Watch Video Solution

2. Draw the free body diagram that represents the particle accelerating in positive x direction

Watch Video Solution

3. As in the diagram three blocks connected together lie on a horizontal frictionless table and pulled to the right with a force F=50 N if $m_1 = 5kgm_2 = 10$ kg and $m_3 = 15kg$ find

the tensions T_1 and T_2



Watch Video Solution

4. What is power ? Give its dimensional formula ?

Watch Video Solution

5. What are geostationary and polar satellites?

Watch Video Solution

6. An iceberg of density $900kgm^{-3}$ is floating in water of density $1000kgm^{-3}$. What is the percentage of volume of iceberg outside the water ?

Watch Video Solution

7. Define terminal velocity.

Watch Video Solution

8. If the earth did not have an atmosphere, would its average surface temperature be higher or lower than what it is now ?

Watch Video Solution

9. A body A is projected upwards with velocity v_1 . Another body B of same mass is projected at an angle of 45°. Both reach the same height. Calculate the ratio of their initial kinetic energies.

Watch Video Solution

Part Iii

1. Write the rules for determining significant figures.

Watch Video Solution

2. Elastic headon collision, consider two particles one is moving and another one is

stationary with their respective masses m and $\frac{M}{m}$. A moving particle meets collides elastically on stationary particle in the opposite direction. Find the kinetic energy of the stationary particle after a collision.

Watch Video Solution

3. Calculate the angle for which a cyclist bends when he turns a circular path of length 34.3 m in $\sqrt{22}$ s.

Watch Video Solution

4. Write down the factors affecting velocity of sound in gases.

Watch Video Solution

5. Why do we have seasons on Earth?

Watch Video Solution

6. When a person breaths, his lungs can hold up to 5.5 Litre of air at body temperature $37^{\circ} C$ and atmospheric pressure $(1 \mathrm{~atm}=101 \mathrm{~kPa})$. This Air contains 21% oxygen. Calculate the number of oxygen molecules in the lungs.

Watch Video Solution

7. Write any five properties of vector product of two vectors.

Watch Video Solution

8. Why does a porter bend forward while carrying a sack of rice on his back ?

Watch Video Solution

9. A piece of wood of mass m is floating erect in a liquid whose density is ρ . If it is slightly pressed down and released, then executes simple harmonic motion. Show that its time period of oscillation is $T = 2\pi\sqrt{\frac{m}{A\rho g}}$

Watch Video Solution

Part Iv

1. Describe the vertical oscillations of a spring.

Watch Video Solution

2. Derive Poiseuille's formula for the volume of a liquid flowing per second through a pipe under streamlined flow.

Watch Video Solution

3. Uniform circular motion.

Watch Video Solution

4. State and prove Bernoulli's theorem for a flow of incompressible, non-viscous, and streamlined flow or fluid.

Watch Video Solution

5. (a) Explain perfect inelastic collision and derive an expression for loss of kinetic energy in perfect inelastic collision.

Watch Video Solution

6. (b) Derive an expression for maximum height attained, time of flight, horizontal range for a projectile in oblique projection.

View Text Solution

7. Define work - energy theorem.

Watch Video Solution

8. Derive Mayer's relation for an ideal gas.

Watch Video Solution

9. Derive the expression pressure exerted by the gas on the walls of the container.

Watch Video Solution

10. Discuss the simple pendulum in detail.

Watch Video Solution