



PHYSICS

BOOKS - FULL MARKS PHYSICS (TAMIL ENGLISH)

SOLVED PAPER -16 (UNSOLVED)

Part I

1. The equation of state for n moles of an idea gas is $PV=nRT$.

Where R is the universal constant. The dimension of R is

A. $M^0 L T^{-2} K^{-1} mol^{-1}$

B. $M L^2 T^{-2} K^{-1} mol^{-1}$

C. $M^0 L^2 T^{-2} K^{-1} mol^{-1}$

D. $M L^{-2} T^{-2} K^{-1} mol^{-1}$

Answer: B



Watch Video Solution

2. If the force is proportional to square of velocity, the the dimensional of proportionality constant is

A. MLT^0

B. $ML^{-1}T^0$

C. MLT^{-1}

D. $ML^{-2}T$

Answer: B



Watch Video Solution

3. An object is dropped is an unknown planet from height 50 m, it reaches the ground is 2 s. The acceleration due to gravity in this unknown planet is

A. $20ms^{-2}$

B. $25ms^{-2}$

C. $15ms^{-2}$

D. $30ms^{-2}$

Answer: B



Watch Video Solution

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

- A. remain the same
- B. increases 2 times
- C. increase 4 times
- D. decrease 2 times

Answer: C



Watch Video Solution

5. The work done on an object does not depend upon the

A. displacement

B. force applied

C. angle between force and displacement

D. initial velocity of the particle

Answer: D



Watch Video Solution

6. A couple produces _____ motion.

A. linear and rotational purely rotational

B. purely rotational

C. purely linear

D. no

Answer: B



Watch Video Solution

7. The ratio $\gamma = \frac{C_P}{C_V}$ for a gas mixture consisting of 8 g of helium and 16 g of oxygen is

A. $\frac{23}{15}$

B. $\frac{15}{23}$

C. $\frac{27}{17}$

D. $\frac{17}{27}$

Answer: C



Watch Video Solution

8. According to Kepler's second law, the radial vector to a planet from the Sun sweeps out equal areas in equal intervals of time. This law is a consequence of:

- A. linear momentum
- B. angular momentum
- C. energy
- D. Newton's law of gravitation

Answer: B



Watch Video Solution

9. If the temperature of the wire is increased, then the Young's modulus will

A. remains the same

B. decrease

C. increase rapidly

D. increase by very a small amount

Answer: B



Watch Video Solution

10. Force acting on the particle moving with constant speed is

- A. always zero
- B. need not be zero
- C. always non-zero
- D. cannot be concluded

Answer: A



Watch Video Solution

11. If the velocity is $\vec{v} = 2\hat{i} + t^2\hat{j} - 9\hat{k}$ then the magnitude of acceleration at $t = 0.5s$ is

A. $1ms^{-2}$

B. $2ms^{-2}$

C. zero

D. $-1ms^{-2}$

Answer: A



Watch Video Solution

12. If two balls are projected at an angle of 60° and 45° and the total heights reached are same, then their initial velocities are in the ratio of ___

A. $2\sqrt{2}:3$

B. $3:2\sqrt{2}$

C. $3:2$

D. $\sqrt{2}:\sqrt{3}$

Answer: D



Watch Video Solution

13. Which of the following different equations represents a damped harmonic oscillator ?

A. $\frac{d^2y}{dt^2} + y = 0$

B. $\frac{d^2y}{dt^2} + \gamma \frac{dy}{dt} + y = 0$

C. $\frac{d^2y}{dt^2} + k^2y = 0$

D. $\frac{dy}{dt} + y = 0$

Answer: B



Watch Video Solution

14. The angular speed of a fly-wheel making 120 revolutions /minute is :

A. $4\pi \text{ rad s}^{-1}$

B. $4\pi^2 \text{ rad s}^{-1}$

C. $\pi \text{ rad s}^{-1}$

D. $2\pi \text{ rad s}^{-1}$

Answer: A



Watch Video Solution

15. The temperature at which the speed of sound in air becomes double its value at $27^{\circ} C$ is

A. $54^{\circ} C$

B. $327^{\circ} C$

C. $927^{\circ} C$

D. cannot be concluded

Answer: C



Watch Video Solution

1. What do you mean by percentage error ?



[Watch Video Solution](#)

2. Write any two uses of dimensional analysis.



[Watch Video Solution](#)

3. Under what condition will a car skid on a leveled circular road ?



[Watch Video Solution](#)

4. Why does a pilot not fall down, when his aeroplane loops a vertical loops ?



[Watch Video Solution](#)

5. State conservation of angular momentum.



[Watch Video Solution](#)

6. A car of mass 1200 kg is traveling around a circular path of radius 300 m with a constant speed of 15m/s. calculate its angular momentum.



[Watch Video Solution](#)

7. State the law of equipartition of energy.



[Watch Video Solution](#)

8. What are the different types of thermodynamic systems ?



[Watch Video Solution](#)

9. Consider two springs with force constants $1Nm^{-1}$ and $2Nm^{-1}$ connected in parallel. Calculate the effective spring constant (k_p) and comment on k_p .



[Watch Video Solution](#)

1. What is Gross Error & How can it be minimised?



[Watch Video Solution](#)

2. Calculate the amplitude, angular frequency, frequency, time period and initial phase for the simple harmonic oscillation given below:

(a) $y = 0.3 \sin(40\pi t + 1.1)$ (b) $y = 2 \cos(\pi t)$

(c) $y = 3 \sin(2\pi t - 1.5)$



[Watch Video Solution](#)

3. Derive an expression for the elastic energy stored per unit volume of a wire.



[Watch Video Solution](#)

4. Why is there no lunar eclipse and solar eclipse every month?



[Watch Video Solution](#)

5. Explain the variation of 'g' with latitude.



[Watch Video Solution](#)

6. Find the expression of the orbital speed of satellite revolving around the earth.



[Watch Video Solution](#)

7. Give any two salient features of static Friction and Kinetic Friction.





[Watch Video Solution](#)

8. Describe the anomalous expansion of water:

How is it helpful in our lives?



[Watch Video Solution](#)

9. Describe the method of measuring angle of

repose



[Watch Video Solution](#)

1. What is a sonometer? Give its construction and working. Explain how to determine the frequency of tuning fork using sonometer.



[Watch Video Solution](#)

2. An object of mass 10 kg moving with a speed of 15 ms⁻¹ hits the wall and comes to rest within (a) 0.03 second (b) 10 second. Calculate the

impulse and average force acting on the object in both the cases



[Watch Video Solution](#)

3. Derive the equations of motion for a particle
(a) falling vertically (b) projected vertically.



[Watch Video Solution](#)

4. Two bodies of masses m and $4m$ are placed at a distance r . Calculate the gravitational

potential at a point on the joining them where the gravitational field is zero.



[Watch Video Solution](#)

5. Write down the difference between simple harmonic motion and angular simple harmonic motion.



[Watch Video Solution](#)