V11Phy

Virudhunagar District Common Examinations
First Revision Test - February 2023

Standard 11
PHYSICS
PART - I

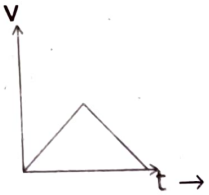
Time: 3.00 Hours

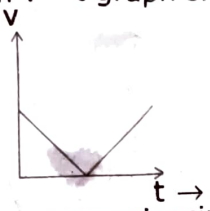
Marks: 70
15×1=15

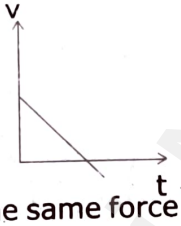
Note: i) **Answer all the questions.**
ii) **Choose the most appropriate answer from the given four options and write the option code and the corresponding answer.**

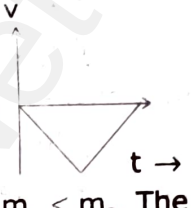
1) If an object is dropped from the top of a building and it reaches the ground at t = 4s, then height of the building is (ignoring air resistance) ($g = 9.8 ms^{-2}$)
a) 77.3 m b) 78.4 m c) 80.5 m d) 79.2 m

2) A ball is projected vertically upwards with a velocity V. It comes back to ground in time t. Which v – t graph shows the motion correctly?

a) 

b) 

c) 

d) 

3) Two masses m_1 and m_2 are experiencing the same force where $m_1 < m_2$. The ratio of their acceleration $\frac{a_1}{a_2}$ is
a) 1 b) less than 1
c) greater than 1 d) all the three cases

4) Force acting on a particle moving with constant speed is
a) always zero b) need not be zero
c) always non zero d) cannot be concluded

5) If the linear momentum of the object is increased by 0.1%, then the kinetic energy is increased by
a) 0.1% b) 0.2% c) 0.4% d) 0.01%

6) A rope is wound around a hollow cylinder of mass 3kg and radius 40cm. What is the angular acceleration of the cylinder if the rope is pulled with a force 30N?
a) 0.25 rad s^{-2} b) 25 rad s^{-2} c) 5 m s^{-2} d) 25 m s^{-2}

7) If a person moves from chennai to Trichy, his weight
a) increases b) decreases
c) remains same d) increases and then decreases

8) Which of the following is not a scalar?
a) viscosity b) surface tension c) pressure d) stress

9) In hot summer after a bath, the body's
a) internal energy decreases b) internal energy increases
c) heat decreases d) no change in internal energy and heat

10) Two identically sized rooms A and B are connected by an open door. If the room A is air conditioned such that its temperature is 4°C lesser than room B, which room has more in it?
a) Room A b) Room B
c) Both room has same air d) cannot be determined

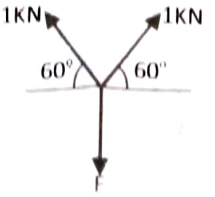
11) The damping force on an ascillator is directly proportional to the velocity. The units of the constant of proportionality are
a) kg ms^{-1} b) kg ms^{-2} c) kg s^{-1} d) kg s

12) A sound wave whose frequency is 5000 Hz travels in air and then hits the water surface. The ratio of its wavelengths in water and air is
a) 4. 30 b) 0.23 c) 5.30 d) 1.23

13) If P_1 and P_2 are the pressure above and below the wing of an aeroplane, ρ is the density of the air, A is the area of the wing and v_1 and v_2 are speed of the air above and below the wing, then dynamic life of aeroplane is
a) $(p_2 + p_1)\rho$ b) $\frac{P_2 + P_1}{A}$ c) $\frac{1}{2}\rho(V_1^2 - V_2^2)A$ d) $\frac{1}{2}\rho(V_1^2 + V_2^2)A$

14) The time period of oscillation of a simple pendulum is $\sqrt{2}$ S, If its length is decreased to half of initial length then its new period is
a) 0.5 S b) 0.707 S c) 1 S d) 2 S

15) Force F in the given figure equals to



a) 1 KN b) 2KN c) 1.73 KN d) 60 KN

PART - II

6×2=12

Note: i) Answer any six of the following questions.
ii) Question No. 24 is compulsory

16) State Wien's law.
17) Define Poisson's ratio.
18) What is Doppler effect?
19) Define displacement and distance.
20) State Lami's theorem.
21) Give any two applications of viscosity.
22) When walking on ice, one should take short steps, why?
23) What is P – V diagram?
24) A particle moves along the X - axis in such a way that its co-ordinates X varies with time 't' according to equation $x = 2 - 5t + 6t^2$. What is the initial velocity of the particle?

PART - III

6×3=18

Note: i) Answer any six of the following questions.
ii) Question No. 33 is compulsory

25) Write the rules for determining significant figures.
26) State Kapler's laws of planetary motion.
27) Describe the method of measuring angle of repose.
28) Explain the working of Refrigerator.
29) Show that the path of projectile is parabola incase of Horizontal projection.
30) Calculate the amplitude, angular frequency, frequencey time period and initial phase for the simple harmonic oscillation $y = 0.3 \sin (40 \pi t + 1.1)$
31) A metal plate of area 2.5×10^{-4} m^2 is placed on a 0.25×10^{-3} m thick layer of castor oil. If a force of 2.5 N is needed to move the plate with a velocity $3 \times10^{-2} ms^{-1}$, Calculate the coefficient of viscosity of caster oil.
32) Why moon has no atmosphere?
33) A ball with a velocity of 5 m/s inclined at angle of 60° with the vertical on a smooth horizontal plane. If the coefficient of restitution is 0.5. Find the velocity and direction after the impact.

PART - IV

5×5=25

Note: i) Answer all the questions.

34) Write a note on triangulation method and radar method to measure larger distances.

(OR)

Explain how overtones are produced in a closed organ pipe.

35) i) Two vectors $\vec{A}$ and $\vec{B}$ of magnitude 5 units and 7 units respectively make an angle 60° with each other and find the magnitude of the resultant vector and its direction with respect to the vector
ii) Derive any three kinematic equations of motion for constant acceleration.

(OR)

Derive Mayer's relation for an ideal gas.

36) i) If the ratio of the orbital distance of two planets $\frac{d_1}{d_2} = 2$, What is the ratic of gravitational field experienced by those two plantes?
ii) Derive the time period of satellite orbiting the earth **(OR)**
b) Derive the expression for moment of inertia of a rod about its centre and perpendicular to the rod.

37) a) Derive the expression for the terminal velocity of a sphere moving in a higher viscous fluid using stokes force **(OR)**
b) Write a three types of ascillations

38) a) Explain the motion of block connected by a string in vertical motion.

(OR)

b) Explain and dervive the work - kinetic energy theorem.