+1 PHYSICS BOOK BACK ONE WORD

UNIT– 1

1. Which of the following are equivalent?
   (a) 6400 km and 6.4 x 10^8 cm (b) 2 x 10^4 cm and 2 x 10^6 mm
   (c) 800 m and 80 x 10^2 m (d) 100 μm and 1 mm
2. Red light has a wavelength of 7000 Å. In μm it is
   (a) 0.7 μm (b) 7 μm (c) 70 μm (d) 0.07 μm
3. A speck of dust weighs 1.6 x 10^{-10} kg. How many such particles would weigh 1.6 kg?
   (a) 10^{-10} (b) 10^{10} (c) 10 (d) 10^{-1}
4. The force acting on a particle is found to be proportional to velocity. The constant of proportionality is measured in terms of
   (a) kg s^{-1} (b) kg s (c) kg m s^{-1} (d) kg m s^{-2}
5. The number of significant digits in 0.0006032 is
   (a) 8 (b) 7 (c) 4 (d) 2
6. The length of a body is measured as 3.51 m. If the accuracy is 0.01 m, then the percentage error in the measurement is
   (a) 351 % (b) 1 % (c) 0.28 % (d) 0.035 %
7. The dimensional formula for gravitational constant is
   (a) $M^1L^3T^{-2}$ (b) $M^{-1}L^3T^{-2}$ (c) $M^{-1}L^{-3}T^{-2}$ (d) $M^1L^{-3}T^2$
8. The velocity of a body is expressed as $v = (x/t) + y$ t. The dimensional formula for x is
   (a) ML^oT^o (b) M^oLT^o (c) M^oL^oT (d) MLT^o
9. The dimensional formula for Planck's constant is
   (a) MLT (b) ML^3T^2 (c) ML^oT^4 (d) ML^2T^{-1}
10. _____have the same dimensional formula
    (a) Force and momentum (b) Stress and strain
    (c) Density and linear density (d) Work and potential energy

UNIT – 2

1. A particle at rest starts moving in a horizontal straight line with uniform acceleration. The ratio of the distance covered during the fourth and the third second is
   (a) $\frac{4}{3}$ (b) $\frac{26}{9}$ (c) $\frac{7}{5}$ (d) 2
2. The distance travelled by a body, falling freely from rest in one, two and three seconds are in the ratio
   (a) 1 : 2 : 3 (b) 1 : 3 : 5 (c) 1 : 4 : 9 (d) 9 : 4 : 1
3. The displacement of the particle along a straight line at time t is given by, $x = a_0 + a_1 t + a_2 t^2$ where a_0, a_1 and a_2 are constants. The acceleration of the particle is
   (a) a_0 (b) a_1 (c) a_2 (d) $2a_2$
4. The acceleration of a moving body can be found from
   (a) area under velocity-time graph
   (b) area under distance-time graph
   (c) slope of the velocity-time graph
   (d) slope of the distance-time graph
5. Which of the following is a vector quantity?
   (a) distance (b) temperature (c) mass (d) momentum
6. An object is thrown along a direction inclined at an angle 45^0 with the horizontal. The horizontal range of the object is
   (a) verticle height (b) twice the vertical height
   (c) thrice the vertical height (d) four times the vertical height
7. Two bullets are fired at an angle θ and (90 – θ) to the horizontal with some speed. The ratio of their times of flight is
   (a) 1:1 (b) tan θ :1 (c)1: tan θ (d) $\tan^2 \theta$:1
8. A stone is dropped from the window of a train moving along a horizontal straight track, the path of the stone as observed by an observer on ground is
   (a) straight line (b) parabola (c) circular (d) hyperbola
9. A gun fires two bullets with same velocity at 60^0 and 30^0 with horizontal. The bullets strike at the same horizontal distance. The ration of maximum height for the two bullets is in the ratio.
   (a) 2 : 1 (b) 3 : 1 (c) 4 : 1 (d) 1 : 1
10. Newton's first law of motion gives the concept of
    (a) energy (b) work (c) momentum (d) inertia
11. Inertia of a body has direct dependence on
    (a) Velocity (b) Mass (c) Area (d) Volume
12. The working of rocket is based on
    (a) Newton's first law of motion (b) Newton's second law of motion
    (c) Newton's third law of motion (d) Newton's first and second law
13. When three forces acting at a point are in equilibrium
    (a) each force is equal to the vector sum of the other two forces
    (b) each force is greater than the sum of the other two forces
    (c) each force is greater than the difference of the other two force
    (d) each force is to product of the other two forces

14. For a particle revolving in a circular path, the acceleration of the particle is
(a) along the tangent (b) along the radius
(c) along the circumference of the circle (d) zero
15. If a particle travels in a circle, covering equal angles in equal times, its velocity vector
(a) changes in magnitude only
(b) remains constant
(c) changes in direction only
(d) changes both magnitude and direction
16. A particle moves along a circular path under the action of a force. The work done by the force is
(a) positive and non-zero (b) zero
(c) negative and non-zero (d) none of the above
17. A cyclist of mass m is taking a circular turn of radius R on a frictional level road with a velocity v. In order that the cyclist does not skid,
(a) $(mv^2/2) > \mu mg$ (b) $(mv^2/r) > \mu mg$
(c) $(mv^2/r) < \mu mg$ (d) $(v/r) = \mu g$
18. If a force F is applied on a body and the body moves with velocity v, the power will be
(a) $F.v$ (b) F/v (c) Fv^2 (d) F/v^2
19. For an elastic collision
(a) the kinetic energy first increases and then decreases
(b) final kinetic energy never remains constant
(c) final kinetic energy is less than the initial kinetic energy
(d) initial kinetic energy is equal to the final kinetic energy

20. A bullet hits and gets embedded in a solid block resting on a horizontal frictionless table. Which of the following is conserved?
(c) momentum and kinetic energy (b) kinetic energy only
(c) momentum alone (d) potential energy alone

UNIT - 3

1. The angular speed of minute arm in a watch is
(a) $\pi/21600\ rad\ s^{-1}$ (b) $\pi/12\ rad\ s^{-1}$
(c) $\pi/3600\ rad\ s^{-1}$ (d) $\pi/1800\ rad\ s^{-1}$
2. The moment of inertia of a body comes into play
(a) in linear motion (b) in rotational motion
(c) in projectile motion (d) in periodic motion
3. Rotational analogue of mass in linear motion is
(a) weight (b) moment of inertia (c) torque (d) angular momentum

4. The moment of inertia of a body does not depend on
(a) angular velocity of the body (b) the mass of the body
(c) the axis of rotation of the body (d) the distribution of mass in the body

5. A ring of radius r and mass m rotates about an axis passing through its centre and perpendicular to its plane with angular velocity ω. Its kinetic energy is
(a) $mr\omega^2$ (b) $\frac{1}{2}mr\omega^2$ (c) $I\omega^2$ (d) $\frac{1}{2}I\omega^2$
6. The moment of inertia of a disc having mass M and radius R, about an axis passing through its centre and perpendicular to its plane is
(a) $\frac{1}{2}MR^2$ (b) MR^2 (c) $\frac{1}{4}MR^2$ (d) $\frac{5}{4}MR^2$
7. Angular momentum is the vector product of
(a) linear momentum and radius vector
(b) moment of inertia and angular velocity
(c) linear momentum and angular velocity
(d) linear velocity and radius vector

8. The rate of change of angular momentum is equal to
(a) Force (b) Angular acceleration
(c) Torque (d) Moment of Inertia

9. Angular momentum of the body is conserved
(a) always
(b) never
(c) in the absence of external torque
(d) in the presence of external torque
10. A man is sitting on a rotating stool with his arms outstretched. Suddenly he folds his arm. The angular velocity.
(a) decreases (b) increases (c) becomes zero (d) remains constant

11. An athlete diving off a high springboard can perform a variety of exercise in the air before entering the water below. Which one of the following parameters will remain constant during the fall. The athlete's
(a) linear momentum (b) moment of inertia
(c) kinetic energy (d) angular momentum

UNIT – 4

1. If the distance between two masses is doubled, the gravitational attraction between them
   (a) is reduced to half (b) is reduced to quarter
   (c) is doubled (d) becomes four times
2. The acceleration due to gravity at a height (1/20)th the radius of the Earth above the Earth's surface is 9 m s^{-2}. Its value at a point at an equal distance below the surface of the Earth is
   (a) 0 (b) 9 m s^{-2} (c) 9.8 m s^{-2} (d) 9.5 m s^{-2}
3. The weight of a body at Earth's surface is W. At a depth half way to the centre of the Earth, it will be
   (a) W (b) W/2 (c) W/4 (d) W/8
4. Force due to gravity is least at a latitude of
   (a) 0^o (b) 45^o (c) 60^o (d) 90^o
5. If the Earth stops rotating, the value of g at the equator will
   (a) increase (b) decrease (c) remains same (d) becomes zero
6. The escape speed on Earth 11.2 km s^{-2}. Its value for a planet having double the radius and eight times the mass of the Earth is
   (a) 11.2 km s^{-1} (b) 5.6 km s^{-1} (c) 22.4 km s^{-1} (d) 44.8 km s^{-1}
7. If r represents the radius of orbit of satellite of mass m moving around a planet of mass M. The velocity of the satellite is given by
   (a) $v^2 = \frac{GM}{r}$ (b) $v = \frac{GM}{r}$ (c) $v^2 = \frac{GMm}{r}$ (d) $v = \frac{Gm}{r}$
8. If the Earth is at one fourth of its present distance from the Sun, the duration of the year will be
   (a) one fourth of the present year (b) half the present year
   (c) one eighth the present year (d) one sixth the present year
9. Which of the following objects do not belong to the solar system?
   (a) Comets (b) Nebulae (c) Asteroids (d) Planets
10. According to Kepler's law, the radius vector sweeps out equal areas in equal intervals of time. The law is a consequence of the conservation of
    (a) angular momentum (b) linear momentum
    (b) energy (d) all of the above

UNIT – 5

1. If the length of the wire and mass suspended are doubled in a Young's modulus experiment, then, Young's modulus of the wire
   (a) remains unchanged (b) becomes double
   (c) becomes four times (d) becomes sixteen times
2. For a perfect rigid body, Young's modulus is
   (a) zero (b) infinity (c) 1 (d) -1
3. Two wires of the same radii and material have their lengths in the ratio 1 : 2. If these are stretched by the same force, the strains produced in the two wires will be in the ratio
   (a) 1 : 4 (b) 1 : 2 (c) 2 : 1 (d) 1 : 1
4. If the temperature of a liquid is raised, then its surface tention is
   (a) decreased (b) increased
   (c) does not change (d) equal to viscosity
5. The excess of pressure inside two soap bubbles of diameters in the ratio 2 : 1 is
   (a) 1 : 4 (b) 2 : 1 (c) 1 : 2 (d) 4 : 1
6. A square of frame of side *l* is dipped in a soap solution. When the frame is taken out, a soap film is formed. The force on the frame due to surface tension T of the soap solution is
   (a) 8 Tl (b) 4 Tl (c) 10 Tl (d) 12 Tl
7. The rain drops falling from the sky neither hit us hard nor make holes on the ground because they move with
   (a) constant acceleration (b) variable acceleration
   (c) variable speed (d) constant velocity
8. Two hail stones whose radii are in the ratio of 1 : 2 fall from a height of 50 km. Their terminal velocities are in the ratio of
   (a) 1 : 9 (b) 9 : 1 (c) 4 : 1 (d) 1 : 4
9. Water flows through a horizontal pipe of varying cross-section at the rate of 0.2 m^3 s^{-1}. The velocity of water at a point where the area of cross-section of the pipe 0.01 m^2 is
   (a) 2 ms^{-1} (b) 20 ms^{-1} (c) 200 ms^{-1} (d) 0.2 ms^{-1}
10. An object entering Earth's atmosphere at a high velocity catches fire due to
    (a) viscosity of air (b) the high heat content of atmosphere
    (c) pressure of certain gases (d) high force of g

UNIT – 6

1. Which of the following is the necessary condition for SHM?
   a) constant period
   b) constant acceleration
   c) displacement and acceleration are proportional
   d) displacement and torque are proportional
2. The displacement of a particle executing SHM is given by $x = 0.01 \sin(100\pi t + 0.05)$. Its time period is
   (a) 0.01 s (b) 0.02 s (c) 0.1 s (d) 0.2 s
3. If the displacement of a particle executing SHM is given by $y = 0.05 \sin(100 t + \frac{\pi}{2}) cm$. The maximum velocity of the particle is
   (a) 0.5 cm s^{-1} (b) 0.05 m s^{-1} (c) 100 m s^{-1} (d) 50 m s^{-1}
4. If the magnitude of displacement is equal to acceleration, then the time period is,
   (a) 1 s (b) π s (c) 2π s (d) 4π s
5. A body of mass 2 g is executing SHM about a mean position with amplitude 10 cm. If the maximum velocity is 100 cm s^{-1} its velocity is 50 cm s^{-1} at a distance of (in cm)
   (a) $5\sqrt{2}$ (b) $50\sqrt{3}$ (c) $5\sqrt{3}$ (d) $10\sqrt{3}$
6. A linear harmonic oscillator has a total energy of 160 J. Its
   a) maximum potential energy is 100 J
   b) maximum kinetic energy is 160J
   c) minimum potential energy is 100 J
   d) maximum kinetic energy is 100 J
7. A force of 6.4 N stretches a vertical spring by 0.1 m The mass that must be suspended from the spring so that it oscillates with a period of $\frac{\pi}{4}$ s is
   (a) $\frac{\pi}{4}$ kg (b) 1 kg (c) $\frac{1}{4}$ kg (d) 10 kg
8. The length of seconds pendulum at a place where g = 9.8 m s^{-2} is
   (a) 0.25 m (b) 1 m (c) 0.99 m (d) 0.50 m
9. A particle executes SHM with amplitude 4 cm. At what displacement from the mean position its energy is half kinetic energy and half potential?
   (a) $2\sqrt{2}$ cm (b) $\sqrt{2}$ cm (c) 2 cm (d) 1 cm
10. A particle executes SHM along a straight line with amplitude 'a'. PE is maximum when the displacement is
    (a) ± a (b) zero (c) + $\frac{a}{2}$ (d) $\frac{a}{\sqrt{2}}$

UNIT – 7

1. In a longitudinal wave there is state of maximum compression at a pint at an instant. The frequency of wave is 50 Hz. After what time will the same point be in the state of maximum rarefaction.
   (a) 0.01 s (b) 0.002 s (c) 25 s (d) 50 s
2. Sound of frequency 256 Hz passes through a medium. The maximum displacement is 0.1 m. The maximum velocity is equal to
   (a) 60π m s^{-1} (b) 51.2π m s^{-1} (c) 256 m s^{-1} (d) 512 m s^{-1}
3. Which of the following does not affect the velocity of sound?
   a) temperature of the gas b) pressure of the gas
   c) mass of the gas d) specific heat capacities of the gas
4. When a wave passes from one medium to another, there is change of
   a) frequency and velocity b) frequency and wavelength
   c) wavelength and velocity d) frequency, wavelength and velocity
5. Sound waves from a point source are propagating in all directions. What will be the ratio of amplitude at a distance 9 m and 25 m from the source?
   (a) 25 : 9 (b) 9: 25 (c) 3 : 5 (d) 81 : 625
6. The intensity levels of two sounds are 100 dB and 50 dB. Their ratio of intensities are
   (a) 10^1 (b) 10^5 (c) 10^3 (d) 10^{10}
7. Number of beats produced by two waves of $y_1 = a \sin 2000\pi t$, $y_2 = a \sin 2008\pi t$ is
   (a) 0 (b) 1 (c) 4 (d) 8
8. In order to increase the fundamental frequency of a stretched string from 100 Hz to 400 Hz, the tension must be increased by
   (a) 2 times (b) 4 times (c) 8 times (d) 16 time
9. The second overtone of an open pipe has the same frequency as the first overtone of a closed pipe of 2 m long. The length of the open pipe
   (a) 2 m (b) 4 m (c) 0.5 m (d) 0.75 m
10. A source of frequency 150 Hz is moving in a direction towards an observer with a velocity 110 m s^{-1}. If the velocity of sound is 330 m s^{-1}, the frequency of sound heard by the person is
    (a) 225 Hz (b) 200 Hz (c) 150 Hz (d) 100 Hz

UNIT– 8

1. Avogadro number is the number of molecules in
   (a) one litre of a gas at NTP (b) one mole of a gas
   (c) one gram of a gas (d) 1 kg of a gas
2. First law of thermodynamics is a consequence of the conversion of
   (a) momentum (b) charge (c) mass (d) energy
3. At a given temperature, the ratio of the RMS velocity of hydrogen to the RMS velocity of oxygen is
   (a) 4 (b) 1/4 (c) 16 (d) 8
4. The property of the system that does not change during an adiabatic change is
   (a) temperature (b) volume (c) pressure (d) heat
5. For an ant moving on the horizontal surface, the number of degrees of freedom of the ant will be
   (a) 1 (b) 2 (c) 3 (d) 6
6. The translational kinetic energy of gas molecules for one mole of the gas is equal to
   (a) $\frac{3}{2}RT$ (b) $\frac{2}{3}kT$ (c) $\frac{1}{2}RT$ (d) $\frac{3}{2}kT$
7. The internal energy of a perfect gas is
   (a) partly kinetic and partly potential
   (b) wholly potential
   (c) wholly kinetic
   (d) depends on the ratio of two specific heats
8. A refrigerator with its power on, is kept in a closed room. The temperature of the room will
   (a) rise (b) fall
   (c) remains the same (d) depend on the area of the theorem
9. A beaker full of hot water is kept in a room. If it cools from 80^0C to 75^0C in t_1 minutes, from 75^0C to 70^0C in t_2 minutes 70^0C and 65^0C in t_3 minutes then
   (a) $t_1 = t_2 = t_3$ (b) $t_1 < t_2 = t_3$
   (c) $t_1 < t_2 < t_3$ (d) $t_1 > t_2 > t_3$
10. Which of the following will radiate heat to the large extent?
    (a) white polished surface (b) white rough surface
    (c) black polished surface (d) black rough surface
11. A block of ice in a room at normal temperature
    (a) does not radiate (b) radiates less but absorbs more
    (c) radiates more than it absorbs (d) radiates as much as it absorbs

UNIT– 9

1. The number of images of an object held between two parallel plane mirrors.
   (a) infinity (b) 1 (c) 3 (d) 0
2. Radius of curvature of concave mirror is 40 cm and the size of image is twice as that of object, then the object distance is
   (a) 20 cm (b) 10 cm (c) 30 cm (d) 60 cm
3. A ray of light passes from a denser medium strikes a rarer medium at an angle of incidence i. The reflected and refracted rays are perpendicular to each other. The angle of reflection and refraction are r and r'. The critical angle is
   (a) $\tan^{-1}(\sin i)$ (b) $\sin^{-1}(\tan i)$ (c) $\tan^{-1}(\sin r)$ (d) $\sin^{-1}(\tan r')$
4. Light passes through a closed tube which contains a gas. If the gas inside the tube is gradually pumped out, the speed of light inside the tube
   (a) increases (b) decreases
   (c) remains constant (d) first increases and then decreases
5. In Michelson's experiment, when the number of faces of rotating mirror increases, the velocity of light
   (a) decreases (b) increases
   (c) does not change (d) varies according to the rotation
6. If the velocity of light in a medium is (2/3) times the velocity of light in vacuum, then the refractive index of that medium is
   (a) 3/2c (b) 2c/3 (c) 2/3 (d) 1.5
7. Tow lenses of power +12 and - 2 dioptre are placed in contact. The focal length of the combination is given by
   (a) 8.33 cm (b) 12.5 cm (c) 16.6 cm (d) 10 cm
8. A converging lens is used to form an image on a screen. When the lower half of the lens is covered by an opaque screen then,
   (a) half of the image will disappear (b) complete image will be disappear
   (c) no image is formed (d) intensity of the image is high
9. Two small angled prism of refractive indices 1.6 and 1.8 produced same deviation, for an incident ray of light, the ratio of angle of prism
   (a) 0.88 (b) 1.33 (c) 0.56 (d) 1.12
10. Rainbow is formed due to
    (a) refraction and absorption (b) dispersion and focusing
    (c) refraction and scattering (d) dispersion and total internal reflection

UNIT – 10

1. Two magnetic poles kept separated by a distance d in vacuum experience a force of 10 N. The force they would experience when kept inside a medium of relative permeability 2, separated by the same distance is

   (a) 20 N (b) 10 N (c) 5 N (d) 40 N

2. The magnetic moment ot a magnet is 5 Am^2. If the pole strength is 25 A m, what is the length of the magnet?

   (a) 10 cm (b) 20 cm (c) 25 cm (d) 1.25 cm

3. A long magnetic needle of length *2l*, magnetic moment M and pole strength m is broken into two at the middle. The magnetic moment and pole strength of each piece will be

   (a) M, m (b) $\frac{M}{2}, \frac{m}{2}$ *(c) M,* $\frac{m}{2}$ *(d)* $\frac{M}{2}$*, m*

4. Two short magnets have equal pole strengths but one is twice as long as the other. The shorter magnet is placed 20 cm in tan A position from the compass needle. The longer magnet must be placed on the other side of the magnetometer for zero deflection at a distance

   (a) 20 cm (b) 20 $(2)^{1/3}$ *cm (c) 20* $(2)^{2/3}$ *cm (d) 20 (2) cm*

5. The direction of a magnet in tan B position of a deflection magnetometer is

   (a) North – South (b) East – West
   (c) North – West (d) South – West

6. The relative permeability of a specimen is 10001 and magnetizing field strength is 2500 Am^{-1}.The intensity of magnetization is

   (a) $0.5 \times 10^{-7}\ A\ m^{-1}$ *(b)* $2.5 \times 10^{-7}\ A\ m^{-1}$
   (c) $2.5 \times 1.0^{+7}\ A\ m^{-1}$ *(d)* $2.5 \times 10^{-1}\ A\ m^{-1}$

7. For which of the following substances, the magnetic susceptibility is independent of temperature?

   (a) diamagnetic (b) paramagnetic
   (c) ferromagnetic (d) diamagnetic and paramagnetic

8. At curie point, a ferromagnetic material becomes

   (a) non – magnetic (b) diamagnetic
   (c) paramagnetic (d) strongly ferromagnetic

9. Electromagnets are made of soft iron, because soft iron has

   (a) low susceptibility and low retentivity
   (b) high susceptibility and low retentivity
   (c) high susceptibility and high retentivity
   (d) low permeability and high retentivity