

PHYSICS 2021

(AS PER CONDENSED SYLLABUS)

TIME: 2 Hours

(85 Marks)

NOTE:

i) This section consists of 42 part questions and all are to be answered. Each question carries ONE marks.

ii) Do not copy the part questions in your answer book. Write only the answer in full against the proper number of the question and its part.

SECTION 'A' (Multiple Choice Questions)(42)

1. Select the correct answer for each from the given options:

(i) Dimension of pressure is:

- * $ML^{-1}T^{-2}$ ✓ * $ML^{-2}T^{-3}$ * $ML^{-2}T^{-1}$ * MLT^{-1}

(ii) To produce same acceleration in the bodies of masses 10 kg and 20 kg the force applied on the second body should be:

- * Halved * Equal to that on first body

* **Doubled** ✓ * Three times

(iii) A truck covers a distance of 360km in 5hrs. its speed will be:

- * 180 km/h * 360 km/h * **72 km/h** ✓ * 36km/h

(iv) How long does it take by a car going at $30ms^{-1}$ to stop if it decelerates at $7m/s^2$:

- * **4s** ✓ * 5s * 6s * 7s

(v) The force acting on a body of 1kg mass falling freely will be:

- * 5N * 19.6N * **9.8N** ✓ * Zero N

(vi) A car is travelling at a constant speed of $20ms^{-1}$ round a curve of radius 100m. Its acceleration is:

- * $2m/s^2$ * $3m/s^2$ * **$4m/s^2$** ✓ * Zero m/s^2

(vii) The rate of change of angular momentum is called :

- * Power * **Torque** ✓ * Momentum * Force

(viii) A 400N force acting perpendicularly to an object at the distance of 200cm from the axis of rotation, the moment of force generated is:

- * 100N m * 200 Nm * 400Nm * **800 Nm** ✓

(ix) If the radius of the earth were to shrink by 1% while its mass remains same, the acceleration due to gravity on the earth surface would:

- * Decrease * Remain the same

* **Increase** ✓ * become half

(x) The speed of sound in space (vacuum) is:

- * 332ms * 344ms * 330ms * **Zero ms^{-1}** ✓

(xi) A simple pendulum is performing S.H.M with time period T. If its length is doubled. The new time period will be:

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- * 2T * 0.5T * 2.5% * **$1.414T$** ✓

(xii) In compound microscope, the image formed by objective is:

- * Virtual and magnified * Real and diminished

* **Real and magnified** ✓ * Virtual and diminished

(xiii) The point in the lens through which the light rays pass without any deviation is called:

- * Optical centre * Optical axis

* Principle axis * **Pole** ✓

(xiv) Work energy equation is called:

* Law of conservation of mass

* Law of conservation of momentum

* **Law of conservation of energy** ✓

* Law of conservation of angular momentum

(xv) A body is executing S.H. with amplitude A. Its potential energy is maximum when its displacement from mean position is:

- * Zero * $\frac{A}{2}$ * **A** ✓ * $\frac{A}{4}$

(xvi) An astronomical telescope when focused for infinity with focal length of objective is 60cm and a focal length of eye piece is 3cm, the length of telescope is:

- * **63cm** ✓ * 20cm * 57cm * 180cm

(xvii) In convex lens when an object is placed beyond 2F then its image will be formed:

* at 2F on the other side

* **between F and 2F on the other side** ✓

* beyond 2F on the other side * at infinity

(xviii) During the projectile motion the acceleration of the projectile along the horizontal direction will:

- * Decrease * Increase * **be zero** ✓ * remain constant

(xix) The dimension of G is:

- * $M^{-1}L^3T^{-2}$ ✓ * $ML^{-2}T^{-3}$ * $M^{-1}L^{-1}T^{-3}$ * $ML^{-2}T^2$

(xx) One radian is equal to:

- * 0.017° * **57.3°** ✓ * 35.7° * 0.117°

(xxi) If $\hat{i}, \hat{j}, \hat{k}$ are unit vector then $\hat{k} \cdot (\hat{i} \times \hat{j})$ is equal to:

- * Zero * **1** ✓ * $\hat{j}$ * $\hat{k}$

(xxii) A weight lifter consumes 500 J of energy to lift a load in 2 seconds. the power consumed is:

- * 125 watt * 500 watt * **250 watt** ✓ * 1000 watt

(xxiii) The equation represents Bragg's law:

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* $m\lambda = 2d \sin \theta$ ✓

* $m\lambda = d \sin \theta$ * $2m\lambda = d \sin \theta$

* $2m\lambda = 3d \sin \theta$

(xxiv) In Young's double slits experiment, the condition for the constructive interference is that the path difference must be:

* An odd multiple of the half wavelength

* An odd multiple of the quarter wavelength

* **An integral multiple of the wavelength** ✓

* An even multiple of one third the wavelength

(xxv) Both Kilowatt hour and electron volt are the units of:

* Power

* **Energy** ✓ * Charge

* Angular momentum

(xxvi) The acceleration of a body moving down a frictionless plane inclined at 30° will be:

* **$4.9m/sec^2$** ✓

* $9.8m/sec^2$ * $98m/sec^3$

* $10m/sec^2$

(xxvii) If the mass of the bot of a simple pendulum is doubled, its time period will:

* be doubled

* **remain same** ✓

* becomes triple * be halved

(xxviii) The unit of Intensity of sound is:

- * $\frac{watt}{m^2}$ ✓ * watt-s * $\frac{watt}{s}$ * $\frac{watt}{m}$

(xxix) The y-component of a vector $A = 15$ units, when it forms an angle of 50° with positive x-axis is:

- * 9.6 units * **11.5 units** ✓ * 9.6 units * -11.5 units

(xxx) The fringe spacing in Young's double slit experiment is:

- * $d\lambda$ * $\frac{L\lambda}{d}$ ✓ * $\frac{Ld}{\lambda}$ * $L\lambda d$

(xxxi) The dimension of angular momentum is:

- * $L^2M^2T^{-2}$ * L^2MT * L^2M^2T * **L^2MT^{-1}** ✓

(xxxii) If the speed of moving body is to be halved, its kinetic energy becomes:

- * **One fourth** ✓ * double * Half * Four times

(xxxiii) It does not exhibit simple harmonic motion:

* A hanging spring supporting a weight

* The motion of the prongs of tuning fork

* **The wheel of an automobile** ✓ * Motion of a string of a violin

(xxxiv) The motion of number of lines per cm of a diffraction grating are 4000, its grating element is:

* **$2.5 \times 10^{-4}cm$** ✓ * $4 \times 10^{-2}cm$

* $2.5 \times 10^{-6}cm$ * $4 \times 10^{-6}cm$

(xxxv) If $\vec{F} = 3\hat{i}$ and $\vec{d} = 6\hat{j}$ the work done will be:

- * zero ✓ * 9 * 18

(xxxvi) The value of the gravitational constant (G) was first determined experimentally by:

- * Newton * **Cavendish** ✓ * Einstein * Maxwell

(xxxvii) The ocean tides are caused by:

* Earth's gravitational force only

* Moon's gravitational force only

* Sun's gravitational force only

* **Gravitational force of both the sun and moon** ✓

(xxxviii) If 'F' be the limiting friction and 'R' the normal reaction then co-efficient of static friction μ is:

- * $\frac{F}{R}$ ✓ * $\frac{R}{F}$ * FR * $\frac{1}{FR}$

(xxxix) The magnifying power of Astronomical telescope is:

- * $f_o = f_e$ * **$f_o \div f_e$** ✓ * $f_o + f_e$ * $f_o - f_e$

(xl) A body will be in complete equilibrium telescope is:

* 1st condition of equilibrium only

* 2nd condition of equilibrium only

* **Both 1st and 2nd condition of equilibrium** ✓

* Neither 1st nor 2nd condition of equilibrium

(xli) The work done by the force of 10N applied to the direction of motion upto 20m is:

- * 10J * 20J * **200J** ✓ * 2000J

(xlii) The SI unit of angular momentum is:

- * **J-s** ✓ * $\frac{J}{s}$ * $\frac{s}{I}$ * $J-s^2$