MULTIPLE CHOICE QUESTIONS (MCQs):

(1) The to and fro motion or up and down motion of a body about its mean position is called:

* Translatory motion
* Vibratory motion
* Rotatory motion
* Angular motion

(2) A vibratory motion is always under:

* An applied force
* A restoring force
* A magnetic force
* A periodic force

(3) Number of vibrations in one second is called:

* Frequency
* Time period
* Amplitude
* Revolution

(4) Time to complete one vibration is called:

* Frequency
* Time period
* Amplitude
* Revolution

(5) The maximum distance covered by a vibrating body from mean the position is called:

* Frequency
* Time Period
* Amplitude
* Revolution

(6) The value of elastic restoring force in case of a sprig:

* kx
* $-kx$
* $\frac{1}{2}kx$
* $\frac{1}{2}kx^2$

(7) In S.H.M the acceleration is:

* Directly proportional to the displacement from mean position
* Inversely proportional to the displacement from mean position
* Directly proportional to the square of displacement from mean position
* Inversely proportional to the square of displacement from mean position

(8) A simple harmonic motion is a type of:

* Rotational motion
* Rectilinear motion
* Circular motion
* Elliptical motion

(9) The acceleration of a projection on the diameter for a body moving along a circle is:

* $-\omega^2 x$
* $-\omega x^2$
* $-\omega x^2$
* ωx^2

(10) The acceleration of vibrating mass attached to the end of as elastic spring is:

* $a = -\frac{k}{m}x$
* $a = \frac{k}{m}x$
* $a = -\omega^2 x$
* $a = \omega^2 x$

(11) The velocity of a vibrating mass attached to the end of an elastic spring is:

* $\sqrt{\frac{k}{m}(x_o^2 - x^2)}$
* $\sqrt{\frac{m}{k}(x_o^2 - x^2)}$
* $\sqrt{\frac{k}{m}(x^2 - x_o^2)}$
* $\sqrt{\frac{m}{k}(x^2 - x_o^2)}$

(12) The maximum velocity of vibrating mass attached to the end of as elastic spring:

* $x_o\sqrt{\frac{m}{k}}$
* $x_o\sqrt{\frac{k}{m}}$
* $x_o\sqrt{\frac{2k}{m}}$
* $x_o\sqrt{\frac{m}{2k}}$

(13) The unit of spring constant K are:

* Joule-sec * Newton-sec
* Newton per meter * Newton-metre

(14) The magnitude of the restoring force is the same as that of the applied force but its direction is:

* Same as that of the applied force * Opposite to the applied force
* Perpendicular to the applied force * Parallel to the applied force

(15) The instantaneous K·E of a mass attached to the end of an elastic spring is:

* $\frac{1}{2}k(x_o^2 - x^2)$ * $\frac{1}{2}k(x_o^2 + x^2)$ * $\frac{1}{2}k(x^2 - x_o^2)$ * $\frac{1}{2}k(x + x_o)$

(16) The maximum K·E of a mass attached to the end of an elastic spring is:

* $\frac{1}{2}kx^2$ * $\frac{1}{2}kx_o^2$ * $\frac{1}{4}kx_o^2$ * kx_o^2

(17) The instantaneous P·E of a mass attached to the end of an elastic spring is:

* $\frac{1}{2}kx_o^2$ * kx_o^2 * $\frac{1}{2}kx^2$ * kx^2

(18) In S.H.M the velocity of a particle is maximum at:

* Extreme positions * Mean position
* Between mean and extreme position on the left side * None of these

(19) In S.H.M the velocity of a particle is minimum at:

* Extreme positions * Mean position
* Between mean and extreme position on the left side * None of these

(20) For S.H.M. it is necessary that:

* $\chi \propto \chi$ * $\chi \propto -\chi$ * $a \propto \chi$ * $a \propto -\chi$

(21) An object is executing SHM. Its Kinetic energy is maximum at its:

* Mean position * Extreme position
* At any point along the path * Non of these

(22) A spring mass system is performing SHM with the period "T" .If we double the mass of its bob, the time period will be:

* T * 2 T * 1.414 T * 0.707 T

(23) The projection of a particle moving in a circle has:

* Rectilinear motion * Circular motion * S. H. M * None of these

(24) The product of time period and frequency of vibration of a particle is equal to:

* 0.5 * 1.0 * 2.0 * π

(25) The quantity which is conserved in simple harmonic motion is:

* Kinetic Energy * Total energy * Potential Energy * Electrical Energy

(26) While passing through its equilibrium position the speed of a body executing simple Harmonic motion becomes:

* Zero * Maximum * One third * Double

(27) The motion of simple pendulum is:

*Always simple harmonic * May be simple harmonic
* Can never be simple harmonic * Circular

(28) If the bob of a vibrating simple pendulum is suddenly detached from the string at its mean position path will be:

* a straight line * a circle * a parabola * a hyperbola

(29) The time period of a simple pendulum is:

* $T = \frac{1}{2\pi}\sqrt{\frac{l}{g}}$ * $T = 2\pi\sqrt{l/g}$ * $T = \frac{1}{2\pi}\sqrt{g/l}$ * $T = 2\pi\sqrt{g/l}$

(30) The time period of simple pendulum is directly proportional to:

* $\sqrt{L}$ * $\sqrt{g}$ * L * $\sqrt{1/L}$

(31) The time period of a simple pendulum depends upon:

* Length * Amplitude * Mass of the bob * Temperature

(32) The time period of a simple pendulums increases if its length:

* Decreases * Increases * Remain content * None of these

(33) If the mass of the bob of a simple pendulum is doubled, its time period will be:

* Double * Be half * Remain constant * None of these

(34) The frequency of oscillation of simple pendulum depends upon:

* The mass of bob * The amplitude of vibration
* The length of pendulum * None of these

(35) The time period of a second's pendulum on the moon will be:

* 4.9 Sec. * 12 Sec. * 2 Sec. * 0.33 Sec.

(36) The frequency of a second's pendulum:

* 1 Hz * 2 Hz * 0.5 Hz * 4 Hz

(37) A unit suitable for frequency is:

* Hertz * Cycle/Sec^2 * Vib./Sec^2 * m/Sec.

(38) The length of second pendulum on earth is:

* 98cm * 98.2cm * 99.2cm * 100cm

(39) The frequency of simple pendulum is:

* $f = 2\pi\sqrt{l/g}$ * $f = \frac{1}{2\pi}\sqrt{l/g}$ * $f = 2\pi\sqrt{g/l}$ * $f = \frac{1}{2\pi}\sqrt{g/l}$

(40) At what place motion of a simple pendulum becomes fastest:

* Lahore * Murree * Karachi * Multan

(41) Which of the following does not exhibit simple harmonic motion:

* A hanging spring supporting a weight * The balance wheel of a watch
* The wheel of an auto mobile * The spring of violins

(42) The time period of a simple pendulum depend upon:

* Mass * Length
* Value of g * Both length and value of g

ANSWER KEY

(1) Vibratory motion	(2) A restoring force
(3). Frequency	(4) Time period
(5) Amplitude	(6) $-k\chi$
(7) Directly proportional to the displacement from mean position	(8) Rectilinear motion
(9) $-\omega^2 x$	(10) $a = -\frac{k}{m}x$
(11) $\sqrt{\frac{k}{m}(x_o^2 - x^2)}$	(12) $x_o\sqrt{\frac{k}{m}}$
(13) Newton per metre	(14) Opposite to the applied force
(15) $\frac{1}{2}k(x_o^2 - x^2)$	(16) $\frac{1}{2}kx_o^2$
(17) $\frac{1}{2}Kx^2$	(18) Mean position
(19) Extreme positions	(20) $a \propto -\chi$
(21) Mean position	(22) 1.414T
(23) S.H.M.	(24) 1.0
(25) Total energy	(26) Maximum
(27) Maybe simple harmonic	(28) A straight line
(29) $T = 2\pi\sqrt{l/g}$	(30) $\sqrt{L}$
(31) Length	(32) Increase
(33) Remain constant	(34) The length of pendulum
(35) 2 Sec	(36) 0.5 Hz
(37) Hertz	(38) 100cm
(39) $f = \frac{1}{2\pi}\sqrt{g/l}$	(40) Karachi
(41) The wheel of an auto mobile	(42) Both length and value of g