GRADE XI A PHYSICS

UNITS AND MEASUREMENTS

	MULTIPLE CHOICE QUESTIONS:
01.	Which of the following is not the unit of distance? (A) Light year (B) Astronomical Unit (C) Parsec (D) Millisecond
02.	Which of the following pairs of physical quantities does not have same dimensional formula? (A) Work and torque (B) Angular momentum and Planck's constant (C) Tension and surface tension (D) Impulse and linear momentum
03	Which of the following systems of units is not based on units of mass, length and time alone? (A) SI (B) MKS (C) CGS (D) FPS
04.	Number of base units in SI system of units is (A) 4 (B) 7 (C) 3 (D) 5
05.	If momentum (p), Area (A) and time (T) are takes as fundamental quantities, then energy has the dimensional formula : (A) $[p A^{1/2} T^{-1}]$ (B) $[p A^{-1/2} T^{1}]$

	(C) [p^2 A T] **(D)** [p A^{-1} T]
06.	Out of 4.0 and 4.00, which is more accurate? (A) 4.0 (B) 4.00 (C) Both are equally accurate (D) (d) Nothing can be said
07	The speed (***v***) of sound in a gas is given by $v = k P^x \rho^y$ Where K is dimensionless constant, P is pressure, and ρ is the density, then (A) x = 1⁄2, y = 1⁄2 (B) x = –1⁄2, y = –1⁄2 (C) x = 1⁄2, y = –1⁄2 (D) x = –1⁄2, y = 1⁄2
08	Second is defined in terms of periods of radiation from Cesium 133 because (A) it is not affected by the change of place (B) it is not affected by the change of time (C) it is not affected by the change of Physical conditions (D) All of these.
09	If percentage errors in the measurement of mass and volume of an object are 2% and 3% respectively, then the percentage error in the measurement of the density of the object is : (A) 1% (B) 0.66% (C)5% (D)6%
10	In the standard equation $S_{nth} = u + \frac{a}{2}(2n-1)$ what dimensions do you view for S_{nth} (A) [M° L^1 T°] (B) [M° L^{-1} T] (C) [M° L T^{-1}] (D) [M° L° T^1]

11	Given force = $\frac{\alpha}{\text{density} + \beta^3}$ what are dimensions of α, β ? (A) $ML^{-2}T^{-2}$, $ML^{-1/3}$ (B) $M^2L^4T^{-2}$, $M^{1/3}L^{-1}$ (C) $M^2L^{-2}T^{-2}$, $M^{1/3}L^{-1}$ (D) $M^2L^{-2}T^{-2}$, ML^{-3}
12	The dimensional formula of intensity is (A) $[L^\circ MT^{-3}]$ (B) $[L^1M^2T^{-2}]$ (C) $[L^2MT^{-2}]$ (D) $[L^2M^2T^{-3}]$
13	The dimensions of the unit 'light year' is (A) T (B) LT^{-1} (C) L (D) T^{-1}
14	The time dependence of a physical quantity P is given by $P = Po\ exp.(-\alpha t^2)$, where α is a constant and t is time, The constant α is (A) dimensionless (B) has dimensions T^{-2} (C) has dimensions of P (D) has dimensions T^2
15	Two quantities A and B have different dimensions. Which mathematical operation may be physically meaningful. (A) A/B (B) A+B (C) A–B (D) A = B

16	Which one of the following pair of quantities has the same dimension? (A) force and work done (B) momentum and impulse (C) pressure and force (D) surface tension and force
17	The equation of state for a real gas is given by $\left(P + \frac{a}{v^2}\right)(v - b) = RT$ the dimensions of constant a are (A) $[M L^5 T^{-2}]$ (B) $[M^{-1} L^5 T^2]$ (C) $[M L^5 T^{-1}]$ (D) $[M L^5 T^{-1}]$
18	The number of significant figures in 30.00 m are (A) 1 (B) 2 (C) 3 (D) 4
19	Dimensional formula for the unit 'curie' is (A) $[M^\circ L T^{-1}]$ (B) $[M^\circ L^{-1} T^\circ]$ (C) $[M^\circ L^\circ T^{-1}]$ (D) $[M^{-1} L^\circ T^\circ]$
20	1° (degree) is equal to (in rad) (A) 17 (B) 174.5×10^{-2} (C) 17.45×10^{-2} (D) 1.745×10^{-2}

21	Very large distances such as the distance of a Planet or a star from Earth can be measured by (A) Spectrograph (B) Millikan's oil drop method (C) Parallax method (D) All of these.
22	One unified atomic mass unit (a.m.u.) is equal to (A) 12 times the mass of one carbon-12 atom (B) 1 of the mass of 12 one atom of C-12 (C) $\frac{1}{12}th$ of the mass of one atom of C-12 (D) 12 times the mass of 12 atoms of C-12
23	Light year is (A) light emitted by the sun in one year. (B) time taken by light to travel from sun to earth. (C) the distance travelled by light in free space in one year. (D) time taken by earth to go once around the sun.
24	Length cannot be measured by (A) fermi (B) hectare (C) micron (D) light year
25	Which one of the following is the smallest unit (A) millimetre (B) angstrom (C) fermi (D) metre
26	SI unit of luminous intensity is (A) lumen (B) lux (C) Candela (D) lux m^{-2}

27	Which of the following is not the unit of time? (A) Micro second (B) Leap year (C) Lunar month (D) Parallactic second
28	Universal time is based on (A)rotation of the earth on its axis (b) earth's orbital motion around the Sun (c) vibrations of cesium atom (d) oscillations of quartz crystal
29	A force is given by $F = at + bt^2$, where t is time, the dimensions of a and b are (A) $[M\ L\ T^{-4}]$ and $[M\ L\ T^{-1}]$ (B) $[M\ L\ T^{-1}]$ and $[M\ L\ T^{0}]$ (C) $[M\ L\ T^{-3}]$ and $[M\ L\ T^{-4}]$ (D) $[M\ L\ T^{-4}]$ and $[M\ L\ T^{0}]$.
30	Systematic errors can be (A) positive only (B) negative one (C) either positive or negative (D) None of these
31	Instrumental errors are due to (A) imperfect design (B) zero error in the instrument (C) Both (a) and (b) (D) None of these
32	The ratio of the mean absolute error to the mean value of the quantity measured is called (A) Absolute error (B) Relative error (C) Percentage error (D) None of these

33	Random error can be eliminated by (A) careful observation (B) eliminating the cause (C) measuring the quantity with more than one instrument (D) taking large number of observations and then their mean.

	ASSERTION & REASON QUESTIONS: **Mark the correct choice as** **(a) If both A & R are correct and R is the correct explanation of A.** **(b) If both A & R are correct and R is not the correct explanation of A.** **(c) If A is true & R is false** (d) **If A is false & R is correct**
1.	**Assertion :** Now a days a standard *metre* is defined in terms of the wavelength of light. **Reason:** Light has no relation with length.
2.	**Assertion:** Parallax method cannot be used for measuring distances of stars more than 100 light years away. **Reason :** Because parallax angle reduces so much that it cannot be measured accurately.
3.	**Assertion : 1** A.U. is much bigger than Å. **Reason : 1** A.U. stands for astronomical unit and Å stands for Angstrom.
4.	**Assertion :** When we change the unit of measurement of a quantity, its numerical value changes. **Reason :** Smaller the unit of measurement smaller is its numerical value.
5.	**Assertion :** The cesium atomic clocks are very accurate. **Reason :** The vibration of cesium atom regulate the rate of cesium atomic clock.