**SAINIK SCHOOL GOPALGANJ**

**SUB: PHYSICS**

**CLASS - XI**

**SUMMER VACATION ASSIGNMENT**

**CHAPTER - 2**

1. The units of modulus of rigidity are

(a)  (b)  (c)  (d) 

1. The unit of absolute permittivity is

(a) (*Farad*-meter) (b)  (*Farad*/meter) (c) (*Farad*/) (d) (*Farad*)

1. Match List-I with List-II and select the correct answer using the codes given below the lists List-I List-II

I. *Joule* A. *Henry*  *Amp*/*sec*

II. *Watt* B. *Farad*  *Volt*

III. *Volt* C. *Coulomb*  *Volt*

IV. *Coulomb* D. *Oersted*  *cm*

E. *Amp*  *Gauss*

F.   *Ohm*

Codes:

(a)  (b) 

(c)  (d) 

1. Which relation is wrong

(a) 1 *Calorie* = 4.18 *Joule*s (b) 

(c)  (d) 

1. If , where  is the distance travelled by the body in kilometres while  is the time in seconds, then the units of *b* are

(a)  (b) 

(c)  (d) 

1. If there is a positive error of 50% in the measurement of velocity of a body, then the error in the measurement of kinetic energy is

(a) 25% (b) 50% (c) 100% (d) 125%

1. A physical quantity *P* is given by *P*=. The quantity which brings in the maximum percentage error in *P* is

(a) *A* (b) *B* (c) *C* (d) *D*

1. If , then 

(a) 4.431 *cm* (b) 4.43 *cm* (c) 4.4 *cm* (d) 4 *cm*

1. The number of significant figures in all the given numbers 25.12, 2009, 4.156 and  is

(a) 1 (b) 2 (c) 3 (d) 4

1. If the length of rod *A* is 3.25 ± 0.01 *cm* and that of *B* is 4.19 ± 0.01 *cm* then the rod *B* is longer than rod *A* by

(a) 0.94 ± 0.00 *cm* (b) 0.94 ± 0.01 *cm* (c) 0.94 ± 0.02 *cm* (d)0.94 ± 0.005 *cm*

1. A physical quantity is given by . The percentage error in measurement of and *T* are and  respectively. Then maximum percentage error in the quantity *X* is

(a)  (b)  (c)  (d)None of these

1. A physical quantity *A* is related to four observable  and *d* as follows, , the percentage errors of measurement in ** and *d* are 1%,3%,2% and 2% respectively. What is the percentage error in the quantity *A*

(a) 12% (b) 7% (c) 5% (d) 14%

1. If the acceleration due to gravity is  and the units of length and time are changed in kilometer and hour respectively, the numerical value of the acceleration is

(a) 360000 (b) 72,000 (c) 36,000 (d) 129600

1. Number of particles is given by  crossing a unit area perpendicular to *X*-axis in unit time, where  and  are number of particles per unit volume for the value of  meant to  and . Find dimensions of  called as diffusion constant

(a)  (b)  (c)  (d) 

1. A highly rigid cubical block  of small mass  and side  is fixed rigidly onto another cubical block of the same dimensions and of low modulus of rigidity  such that the lower face of  completely covers the upper face of . The lower face of is rigidly held on a horizontal surface. A small force  is applied perpendicular to one of the side faces of . After the force is withdrawn block  executes small oscillations. The time period of which is given by

(a)  (b)  (c)  (d) 

1. The speed of light , gravitational constant  and Planck's constant  are taken as the fundamental units in a system. The dimension of time in this new system should be

(a)  (b)  (c)  (d) 

1. If the constant of gravitation , Planck's constant  and the velocity of light  be chosen as fundamental units. The dimension of the radius of gyration is

(a)  (b) (c)  (d)

1. In the relation  *P* is pressure, *Z* is the distance, *k* is Boltzmann constant and *θ* is the temperature. The dimensional formula of *β* will be

(a)  (b) 

(c)  (d) 

1. A wire has a mass , radius  and length . The maximum percentage error in the measurement of its density is

(a)1 (b) 2 (c)3 (d) 4

1. The dimensional formula for Planck's constant  is

(a)  (b)  (c)  (d)

1. Out of the following, the only pair that does not have identical dimensions is

(a) Angular momentum and Planck's constant

(b) Moment of inertia and moment of a force

(c) Work and torque

(d) Impulse and momentum

1. Which of the following is dimensionally correct

(a) Pressure = Energy per unit area (b) Pressure = Energy per unit volume

(c) Pressure = Force per unit volume (d) Pressure = Momentum per unit volume per unit time

1. The equation of state of some gases can be expressed as . Here  is the pressure,  is the volume,  is the absolute temperature and  are constants. The dimensions of  are

(a)  (b)  (c)  (d) 

1. If  denotes the potential difference across the plates of a capacitor of capacitance , the dimensions of are

(a) Not expressible in  (b)  (c)  (d)

1. Of the following quantities, which one has dimensions different from the remaining three

(a) Energy per unit volume

(b) Force per unit area

(c) Product of voltage and charge per unit volume

(d) Angular momentum per unit mass

1. Find and expression for the maximum error when a physical quantity depends upon the products of two physical quantities.
2. Find an expression for the maximum error when a physical quantity depends upon the powers of two physical quantities.
3. The nearest star to our solar system is 4.29 light years away. How much is this distance in terms of parsecs? How much parallax in terms of parsecs? How much parallax would this star (named Alpha Centauri) show, when viewed from two locations of the earth six months a part is its orbit around the sun?
4. if x = *a + bt + ct2*, where x is in meters and tin seconds, find the units of *b*.
5. Convert 1 newton into dyne using dimensional analysis.
6. The wavelength ‘λ’ associated with a moving particle depends upon its mass ‘m’, its velocity ‘v’ and Plank’s constant ‘h’. Show dimensionally that .
7. A planet moves round the sun in a circular orbit. The time period of revolution T of the planet depends on:*(i)*radius of the orbit R*(ii)*mass of the sun M and*(iii)*gravitational constant G Confirm dimensionally that T2 ∝ R3
8. Define parallax. Use this method to estimate the distance of a nearby heavenly object.
9. If two resistors of resistances R1 = (4± 0.5) Ω and R2 = (16 ± 0.5) Ω are connected (*i*) in series and (*ii*) in parallel; find the equivalent resistance in each case with limits of percentage error.
10. The frequency of vibration of a string depends of on, (i) tension in the string (ii) mass per unit length of string, (iii) vibrating length of the string. Establish dimensionally the relation for frequency.