

Ans 1 a) Principle of homogeneity - It states that dimensions of all terms on L.H.S of an equation must be equal to the dimensions of all terms on R.H.S.

b) Fundamental unit - Three base units selected for the measurement of mass, length and time are called fundamental units. They are independent units and cannot be derived.

c) velocity =  $[L T^{-1}]$  .  $\left[ \begin{array}{l} \text{velocity} = \frac{\text{distance}}{\text{time}} \\ = \frac{L}{T} = L T^{-1} \end{array} \right]$

d) MKS unit of force is  $\text{Kg m/s}^2$  or Newton.

e) Scalar quantity - The physical quantity which possess only magnitude and no direction are called scalar quantities. Ex- mass, distance etc.

f) Full form of MKS  $\rightarrow$  Metre, Kilogram, Second.

g) Force is defined as a push or pull which changes or tries to change the state of rest or of uniform motion of a body.

## 1) Formula of Potential Energy

$$P.E = mgh$$

where  $m$  = mass of body

$g$  = acceleration due to gravity

$h$  = height above ground.

## P) Dimensional formula of Pressure

$$\text{Pressure} = \frac{F}{A} = \frac{\text{Mass} \times \text{acc.}}{\text{area}}$$

$$= \frac{MLT^{-2}}{L^2} = [ML^{-1}T^{-2}]$$

Q) Positive Work - The work done is said to be positive if the angle between force and displacement vector is less than  $90^\circ$ . The work done is a scalar quantity. For eg. if we pull an object, the displacement is in same direction as applied force and work done is said to be positive.

2) Potential Energy - The energy possessed by a body due to its position above the ground is called Potential Energy. Ex- water stored in a dam.

l) Ionization Potential - The minimum potential required by an atom to completely remove its outermost electron from it is called ionization potential.

m) Fiber optics - An optical fibre is a flexible transparent fibre made from plastic or glass and is mostly used to transmit light. The light is transmitted on the basis of total internal reflection.

n) Superconductivity - It is a phenomenon of zero electrical resistance and expulsion of magnetic flux (Meissner effect) observed in certain materials when they are cooled below a certain characteristic temperature called critical temperature.

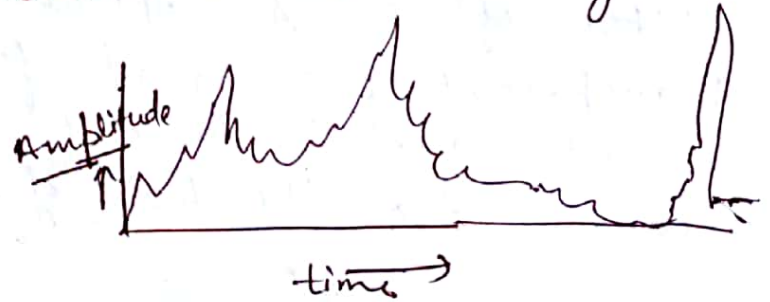
o) Ultrasonic - It is the sound wave having frequency greater than 20,000 Hz. A normal human ear cannot hear an ultrasonic sound.

p) Relation between  $v$ ,  $n$ ,  $\lambda$  - wavelength  
velocity, frequency

$$v = n\lambda$$

Q) SONAR - Its full form is sound navigation and ranging.

Q) Noise - It is unwanted sound which we do not want to hear and has an irregular amplitude.



h) Time Period - It is defined as time taken complete one revolution or rotation or vibration of motion. It is measured in second in SI system.

i) Energy is defined as ability to do work.

Energy = Work = Force  $\times$  displacement.  
Its SI unit is Joule.

j) Power is defined as rate of doing work.

$$\text{Power} = \frac{\text{Work}}{\text{Time}}$$

It is measured in Watt.

k) Rotational Motion - Rotation is motion of an object in circular way about an axis. The axis may exist inside or outside the object.  
Ex - Rotation of a fan about its own axis lying at centre of the fan.

l) Torque - It is defined as rotational analogue of force. It is measured by cross product of force and the perpendicular distance from line of action of force.

$$\tau = \vec{r} \times \vec{F} = rF \sin \theta$$

m) Surface Tension - The property of free surface of liquid at rest due to which free surface behaves like a stretched membrane. It is measured by force experienced per unit length of free surface of liquid.

$$T = \frac{F}{l} = \text{Nm}^{-1}$$

g) Dielectric - It is an electrically insulating medium placed between the plates of capacitor to increase its capacitance. They do not allow electric current to pass through them but electric polarization occurs in them when they are placed in electric field.

h) Resistance - is opposition to the flow of current. It is measured by ratio of potential difference and the current flowing across the ends of conductor. It is measured in ohm.

i) Electric Power - It is the rate per unit time at which electrical energy is transferred by an electric circuit. S.I. unit is watt.

Formula  $P = VI$

j) Half wave Rectifier - It is a device which converts half wave of <sup>(alternating current)</sup> ac signal into dc (direct current). The circuit consists of a diode and a load resistor.

k) Laser - It is defined as light amplification by stimulated emission of radiation.