DPP
DAILY PRACTICE PROBLEMS

CLASS : XITH
DATE :

Solutions

SUBJECT : PHYSICS
DPP NO. : 8

Topic :-UNITS AND MEASUREMENTS

1 **(d)**

Dimensional formula of magnetic flux

$$= [ML^2T^{-2}A^{-1}]$$

3 **(c)**

Area velocity is area covered per unit time.

4 **(b)**

Unit of $\varepsilon_0 = C^2/N \text{ - } m^2 \ \therefore$ Unit of $K = Nm^2C^{-2}$

5 **(c)**

Potential can be written a potential energy per unit charge,

$$V = \frac{W}{q} = \frac{U}{q}$$

Hence, dimensions of potential are the same as that of work per unit charge.

6 **(a)**

$[L/R]$ is a time constant so its unit is $second$

7 **(c)**

$$R = \rho\frac{L}{A} \Rightarrow \rho = \frac{RA}{L} = \text{ohm} \times cm$$

8 **(a)**

Let $n = k\rho^a a^b T^c$ where $[\rho] = [ML^{-3}]$, $[a] = [L]$ and $[T] = [MT^{-2}]$

Comparing dimensions both sides we get

$a = \frac{-1}{2}$, $b = \frac{-3}{2}$ and $c = \frac{1}{2} \ \therefore \eta = k\rho^{-1/2}a^{-3/2}T^{-1/2}$

$$= \frac{K\sqrt{T}}{\rho^{1/2}a^{3/2}}$$

10 **(a)**

Diameter of wire,

$$d = \text{MSR} + \text{CSR} \times \text{LC}$$

$$= 0 + 52 \times \frac{1}{100}$$

$$= 0.52 \text{ mm} = 0.052 \text{ cm}.$$

11 **(d)**

$[\eta] = ML^{-1}T^{-1}$ so its unit will be $kg/m\text{-}sec$

12 **(c)**

$F = \frac{Gm_1m_2}{d^2}$; $\therefore\ G = \frac{Fd^2}{m_1m_2} = Nm^2/kg^2$

13 **(a)**

$K = C + 273.15$

14 **(a)**

$k = \left[\frac{R}{N}\right] = [ML^2T^{-2}\theta^{-1}]$

15 **(a)**

$\frac{[\text{Energy}]}{[\text{Volume}]} = \frac{[\text{ML}^2\text{T}^{-2}]}{[\text{L}^3]} = [\text{ML}^{-1}\text{T}^{-2}]$

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

17 **(b)**

Capacitance $C = \frac{\text{Charge}}{\text{potential}} = \frac{q}{V}$

Also potential $= \frac{\text{work}}{\text{charge}}$ $\left(\because V = \frac{W}{q}\right)$

$\therefore\ \ C = \frac{q^2}{J}$ as well as $C = \frac{J}{V^2}$.

Thus, (a), (c), (d) are equivalent to farad but (b) is not equivalent to farad.

18 **(b)**

Velocity $v = k\lambda^a\rho^b g^c \Longrightarrow [\text{M}^0\text{LT}^{-1}] = [\text{L}^a][\text{M}^b\text{L}^{-3b}][\text{L}^c\text{T}^{-2c}]$

Or $[\text{M}^0\text{LT}^{-1}] = [\text{M}^b\text{L}^{a-3b+c}\text{T}^{-2c}]$

Equating powers of M,L and T, we get

$-2c = -1$

Again, $a - 3b + c = 1, b = 0, c = \frac{1}{2}$

$\therefore\ v = k\lambda^{1/2}\rho^0 g^{1/2}$ or $v^2 \propto g\lambda$

19 **(a)**

Impulse = force $\times$ time

$$= [\text{MLT}^{-2}][\text{T}]$$

$$= [\text{MLT}^{-1}]$$

20 **(a)**

$X = [M^aL^bT^c]$

Maximum % error in $X = a\alpha + b\beta + c\gamma$

ANSWER-KEY										
Q.	1	2	3	4	5	6	7	8	9	10
A.	D	C	C	B	C	A	C	A	D	A
Q.	11	12	13	14	15	16	17	18	19	20
A.	D	C	A	A	A	D	B	B	A	A