PHYSICS

BOOKS - NEET PREVIOUS YEAR (YEARWISE + CHAPTERWISE)

PHYSICAL WORLD AND MEASUREMENT

Physical

1. A physical energy of the dimension of length that can be formula cut of c, G and $\dfrac{e^2}{4\pi\varepsilon_0}$ is [c is velocity of light G is universal constant of gravilation e is change

A. $\dfrac{1}{c^2}\left[G\dfrac{e^2}{4\pi\varepsilon_0}\right]^{1/2}$

B. $c^2\left[G\dfrac{e^2}{4\pi\varepsilon_0}\right]^{1/2}$

C. $\dfrac{1}{c^2}\left[\dfrac{e^2}{G4\pi\varepsilon_0}\right]^{1/2}$

D. $\dfrac{1}{c}G\dfrac{e^2}{4\pi\varepsilon_0}$

Answer: A

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2. If energy (E) , velocity (V) and time (T) are chosen as the fundamental quantities , the dimensions formula of surface tension will be

A. $[Ev^{-2}T^{-1}]$

B. $[Ev^{-1}T^{-2}]$

C. $[Ev^{-2}T^{-2}]$

D. $[E^{-2}v^{-1}T^{-3}]$

Answer: C

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3. In dimension of circal velocity v_0 liquid following through a take are expressed as $(\eta^x \rho^y r^z)$ where η, ρ and $r$are the coefficient of viscosity of liquid density of liquid and radius of the tube respectively then the value of x, y and z are given by

A. $1, \ -1, \ -1$

B. $-1, \ -1, 1$

C. $-1, \ -1, \ -1$

D. $1, 1, 1$

Answer: A

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4. If force (F), velocity (V) and time (T) are taken as fundamental units, then the dimensions of mass are

A. $\left[FvT^{-1}\right]$

B. $\left[FvT^{-2}\right]$

C. $\left[Fv^{-1}T^{-1}\right]$

D. $\left[Fv^{-1}T\right]$

Answer: D

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5. In an experiment four quantities a,b,c and d are measure with percentage error 1%, 2%, 3% ,and 4% respectively quantity is P is calculate as follow

$P=\dfrac{a^3b^2}{cd}\%$ error in P is

A. 14%

B. 10%

C. 7%

D. 4%

Answer: A

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6. The dimensions of $(\mu_0 \varepsilon_0)^{-1/2}$ are

A. $\left[L^{1/2} T^{-1/2}\right]$

B. $[L^{-1}T]$

C. $[LT^{-1}]$

D. $[L^{1/2}T^{1/2}]$

Answer: C

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7. The dimension of $\left(\frac{1}{2}\right)\varepsilon_0 E^2$ (ε_0 : permittivity of free space, E electric field

A. $[ML^2T^{-2}]$

B. $[ML^{-1}T^{-2}]$

C. $[ML^2T^{-1}]$

D. $[MLT^{-1}]$

Answer: B

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8. If the dimension of a physical quantity are given by $M^aL^bT^c$, then the physical quantity will be

A. pressure if $a = b, b = -1, c = -2$

B. velocity is $a = 1, b = 0, c = -1$

C. acceleration if $a = 1, b = 1, c = -2$

D. force if $a = 0, b = -1, c = -2$

Answer: A

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9. Which two of the following five physical parameters have the same dimension?

(1) Energy density

(2) refractive index

(3) dielectric constant

(4) Young's modulus

(5) magnitic field

A. (ii) and (iv)

B. (iii) and (v)

C. (i) and (iv)

D. (i) and (v)

Answer: C

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10. If the error in the measurement of radius of a sphere in 2% then the error in the determination of volume of the spahere will be

A. 4%

B. 6%

C. 8%

D. 2%

Answer: B

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11. Dimension of resistance in an elecatrical circuit, in terms of dimension of mass M, of length L, of time T, and of current I, would be

A. $\left[ML^2T^{-3}l^{-1}\right]$

B. $\left[ML^2T^{-2}\right]$

C. $\left[ML^2T^{-1}l^{-1}\right]$

D. $\left[ML^2T^{-3}l^{-2}\right]$

Answer: D

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12. The velocity v of a particle at time t is given by $v = at + \frac{b}{t+c}$, where a, b and c are constants. The dimensions of a, b, c are respectively :-

A. $[LT^{-2}]$, $[L]$ and $[T]$

B. $[L^2]$, $[T]$ and $[LT^2]$

C. $[LT^2]$, $[LT]$ and $[L]$

D. $[L]$, $[LT]$ and $[T^2]$

Answer: A

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13. The ratio of the dimensions of plank's constant and that of the moment of inertia is the dimension of

A. frequency

B. velocity

C. angular momentum

D. time

Answer: A

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14. The dimensionas of universal gravitational constant are ____

A. $\left[M^{-1}L^3T^{-2}\right]$

B. $\left[ML^2T^{-1}\right]$

C. $\left[M^{-2}L^3T^{-2}\right]$

D. $\left[M^{-2}L^2T^{-1}\right]$

Answer: A

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15. The unit of permittivity of free space ε_0 is:

A. coulomb/newton-metre

B. $\dfrac{\text{newton-metre}^2}{\text{coulomb}^2}$

C. $\dfrac{\text{coulomb}^2}{\text{newton-metre}^2}$

D. $\dfrac{\text{coulomb}^2}{(\text{newton-metre})^2}$

Answer: C

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16. The value of Planck's constant in SI unit is

A. $6.63 \times 10^{-31} J - s$

B. $6.63 \times 10^{-30} kg - m / s$

C. $6.63 \times 10^{-32} kg - m^2$

D. $6.63 \times 10^{-34} J - s$

Answer: D

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17. Plancks' constant has the dimensions of

A. linear momentum

B. angular momentum

C. energy

D. power

Answer: B

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18. A pair of physical quantities having same dimensional formula is

A. force and torque

B. work and energy

C. force and impulse

D. linear momentum and angular momentum

Answer: B

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19. The dimensional formula for magnetic flux is

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

B. $[ML^3T^{-2}A^{-2}]$

C. $[M^0L^{-2}T^2A^{-2}]$

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

Answer: A

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20. The force F on a sphere of radius r moving in a medium with velocity v is given by $F = 6\pi\eta rv$. The dimensions of η are

A. $[ML^{-3}]$

B. $[MLT^{-2}]$

C. $[MT^{-1}]$

D. $[ML^{-1}T^{-1}]$

Answer: D

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21. Which of the following will have the dimensions of time ?

A. LC

B. $\frac{R}{L}$

C. $\frac{L}{R}$

D. $\frac{C}{L}$

Answer: C

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22. The density of a cube is measured by measuring its mass and length of its sides. If the maximum error in the measurement of mass and length are 4% and 3% respectively, the maximum error in the measurement of density will be

A. $7\,\%$

B. $9\,\%$

C. $12\,\%$

D. $13\,\%$

Answer: D

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23. An equation is given as $\left(p + \frac{a}{V^2}\right) = b\frac{\theta}{V}$,where $p =$ pressure $V =$ volumen and $\theta =$ absolute temperature. If a and b are constants, then dimensions of a will be

A. $\left[ML^5T^{-2}\right]$

B. $\left[M^{-1}L^5T^{-2}\right]$

C. $\left[ML^{-5}T^{-1}\right]$

D. $[ML^5T]$

Answer: A

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24. Percentage error in the measurement of mass and speed are 2% and 3% respectively. The error in the measurement of kinetic energy obtained by measuring mass and speed will be

A. $12\ \%$

B. 10%

C. 8%

D. 2%

Answer: C

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25. Which of the following is a dimensional constant?

A. Refractive index

B. Poisson's ratio

C. Relative density

D. Gravitational constant

Answer: D

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26. In a vernier calliper, N divisions of vernier scale coincide with (N-1) divisions of main scale (in which division represent 1mm). The least count of the instrument in cm. should be

A. N

B. $N - 1$

C. $\frac{1}{10N}$

D. $\frac{1}{(N - 1)}$

Answer: C

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27. In a particular system the units of length, mass and time are chosen to be $10cm, 10g$

and $0.1s$ respectively. The unit of force in this system will be equal to

A. $0.1N$

B. $1N$

C. $10N$

D. $100N$

Answer: A

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28. Turpentine oil is flowing through a tube of length L and radius r. The pressure difference between the two ends of the tube is p , the viscosity of the coil is given by $\eta=\frac{p\left(r^2-x^2\right)}{4 v L}$, where v is the velocity of oil at a distance x from the axis of the tube. From this relation, the dimensions of viscosity η are

A. $\left[M^0 L^0 T^0\right]$

B. $\left[M L T^{-1}\right]$

C. $\left[M L^2 T^{-2}\right]$

D. $[ML^{-1}T^{-1}]$

Answer: D

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29. The time dependence of a physical quantity P is given by $P = P_0 \exp(-\alpha t^2)$, where α is a constant and t is time. The constant α

A. is dimensionless

B. has dimensions $[T^{-2}]$

C. has dimensions $[T^2]$

D. has dimensions of p

Answer: B

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30. If P represents radiation pressure , C represents the speed of light , and Q represents radiation energy striking a unit area per second , then non - zero integers

x, y, z such that $P^x Q^y C^z$ is dimensionless , find the values of $x, y, \text{ and } z$.

A. $x = 1, y = 1, z = 1$

B. $x = -1, y = 1, z = 1$

C. $x = 1, y = -1, z = 1$

D. $x = 1, y = 1, z = -1$

Answer: C

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31. The dimensional formula for permeability of free space, μ_0 is

A. $\left[MLT^{-2}A^{-2}\right]$

B. $\left[ML^{-1}T^{2}A^{-2}\right]$

C. $\left[ML^{-1}T^{-2}A^{2}\right]$

D. $\left[MLT^{-2}A^{-1}\right]$

Answer: A

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32. A certain body weighs $22.42g$ and has a measured volumen of $4.7cc.$ The possible error in the measurement of mass and volumen are $0.01g$ and $0.1cc.$ Then, maximum error in the density will be

A. $22\ \%$

B. $2\ \%$

C. $0.2\ \%$

D. $0.02\ \%$

Answer: B

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33. The frequency f of vibrations of a mass m suspended from a spring of spring constant k is given by $f = Cm^x k^y$, where C is a dimensionnless constant. The values of x and y are, respectively,

A. $x = \frac{1}{2}, y = \frac{1}{2}$

B. $x = -\frac{1}{2}, y = -\frac{1}{2}$

C. $x = \frac{1}{2}, y = -\frac{1}{2}$

D. $x = -\frac{1}{2}, y = \frac{1}{2}$

Answer: D

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34. According to Newton, the viscous force acting between liquid layers of area A and velocity gradient $\frac{\Delta v}{\Delta z}$ is given by $F = -\eta A \frac{dv}{dz}$, where η is constant called

A. $[ML^{-2}T^{-2}]$

B. $[M^0L^0T^0]$

C. $[ML^2T^{-2}]$

D. $[ML^{-1}T^{-1}]$

Answer: D

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35. Thd dimensional formula of pressure is

A. $[MLT^{-2}]$

B. $[ML^{-1}T^{2}]$

C. $[ML^{2}T^{-2}]$

D. $[ML^{-1}T^{-1}]$

Answer: C

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36. The dimensional formula of torque is

A. $[ML^2T^{-2}]$

B. $[MLT^{-2}]$

C. $[ML^{-1}T^{-2}]$

D. $[ML^{-2}T^{-2}]$

Answer: A

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37. If $x = at + bt^2$, where x is the distance rtravelled by the body in kilometer while t is the time in seconds , then find the units of b.

A. km / s

B. $km - s$

C. km / s^2

D. $km - s^2$

Answer: C

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38. Dimensional formula of self-inductance is

A. $[MLT^{-2}A^{-2}]$

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

C. $[ML^2T^{-2}A^{-2}]$

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

Answer: C

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

A. Energy per unit volume

B. Force per unti area

C. Product of voltage and charge per unti volume

D. Angular momentum

Answer: D

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40. The dimensional formula for angular momentum is

A. $[ML^0L^2T^{-2}]$

B. $[ML^2T^{-1}]$

C. $[MLT^{-1}]$

D. $[ML^2T^{-2}]$

Answer: B

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41. If C and R denote capacitance and resistance respectively, then the dimensional formula of CR is

A. $[ML^0L^0T]$

B. $[M^0L^0T^0]$

C. $[M^0L^0T^{-1}]$

D. Not expressible in terms of $[MLT]$

Answer: A

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