Yakeen NEET 2.0 2026

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Units and Measurements

DPP: 3

Q1 Suppose refractive index μ is given as

$$\mu = A + \frac{B}{\lambda^2}$$

Where A and B are constants and λ is the wavelength, then dimensions of B are same as that of

(A) Wavelength
(B) Volume
(C) Pressure
(D) Area

Q2 If $F = \frac{v}{C \ln(xb)}$, then

(A) F and v denote force and velocity, the dimensions of C are $[MT]$
(B) x denote distance, the dimensions of b are $[L^{-1}]$
(C) the dimensions of $\frac{v}{C}$ can never be same as F
(D) the dimensions of x must be same as $\frac{v}{Cb}$

Q3 If a unit of length becomes $(1/10)\mathrm{m}$ instead of $1\ \mathrm{m}$ then what will be the numerical value of the volume of a cube of $500\ \mathrm{m}^3$?

(A) $2 \times 10^4\ \mathrm{m}^3$
(B) $5 \times 10^5\ \mathrm{m}^3$
(C) $3 \times 10^5\ \mathrm{m}^3$
(D) $2 \times 10^5\ \mathrm{m}^3$

Q4 Imagine a system of units in which the unit of mass is 10 kg, length is 1 km and time is 1 minute. Then 1 J in this system is equal to ______ units of work;

(A) 360
(B) 3.6
(C) 3.6×10^5
(D) 36×10^{-5}

Q5 If mass is measure in units of $\alpha \mathrm{kg}$, length in βm and time in γ s then calorie would be

(A) $4.2\alpha\beta^2\gamma^{-2}$
(B) $4.2\alpha^{-1}\beta^2\gamma^2$
(C) $4.2\alpha^{-1}\beta^{-2}\gamma^2$
(D) $4.2\alpha^{-2}\beta^{-1}\gamma^{-2}$

Q6 The density of a material in CGS system of units is $4\ \mathrm{g/cm}^3$. In a system of units in which unit of length is $10\ \mathrm{cm}$ and unit of mass is $100\ \mathrm{g}$, the value of density of material will be

(A) 400
(B) 0.04
(C) 0.4
(D) 40

Q7 If $E =$ energy, $G =$ gravitational constant, $I =$ Impulse and $M =$ mass, then dimensions of $\frac{GIM^2}{E^2}$ are same as that of

(A) Time
(B) Mass
(C) Length
(D) Force

Q8 A physical quantity X is defined as $X = \frac{a^2b^3}{c\sqrt{d}}$, where $a, b, c,$ and d have dimensions of length $[L]$, mass $[M]$, time $[T]$, and current $[I]$, respectively. What are the dimensions of X ?

(A) $[X] = L^2M^3T^{-1}I^{-1/2}$
(B) $[X] = L^2M^2T^{-1}I^{-1/2}$
(C) $[X] = L^3M^3T^{-1}I^{-1/2}$
(D) $[X] = L^2M^3T^{-2}I^{-1/2}$

Q9 Two quantities A and B have different dimensions. Which mathematical operation given below is physically meaningful ?

(A) $\mathrm{A/B}$
(B) $\mathrm{A+B}$
(C) $\mathrm{A-B}$
(D) None of these

Q10 Planck's constant (h), speed of light in vacuum (c) and Newton's gravitational constant (G) are three fundamental constants. Which of the following combinations of these has the dimension of length ?
(A) $\frac{\sqrt{hG}}{c^{3/2}}$
(B) $\frac{\sqrt{hG}}{c^{5/2}}$
(C) $\sqrt{\frac{hc}{G}}$
(D) $\sqrt{\frac{Gc}{h^{3/2}}}$

Q11 A force F is given by $F=at+bt^2$, where t is time. What are the dimensions of a and b ?
(A) $\left[MLT^{-3}\right]$ and $\left[ML^2T^{-4}\right]$
(B) $\left[MLT^{-3}\right]$ and $\left[MLT^{-4}\right]$
(C) $\left[MLT^{-1}\right]$ and $\left[MLT^{0}\right]$
(D) $\left[MLT^{-4}\right]$ and $\left[MLT^{1}\right]$

Q12 The dimensions of physical quantity X in the equation, $\text{Force}=\frac{X}{\text{Density}}$ is given by
(A) $\left[M^1L^4T^{-2}\right]$
(B) $\left[M^2L^{-2}T^{-1}\right]$
(C) $\left[M^2L^{-2}T^{-2}\right]$
(D) $\left[M^1L^{-2}T^{-1}\right]$

Q13 If force [F], acceleration [A] and time [T] are chosen as the fundamental physical quantities. Find the dimensions of energy.
(A) $[F][A][T^{-1}]$
(B) $[F][A^{-1}][T]$
(C) $[F][A][T]$
(D) $[F][A][T^2]$

Q14 If force, acceleration and time are taken as fundamental quantities, then the dimensions of length will be
(A) FT^2
(B) $F^{-1}A^2T^{-1}$
(C) FA^2T
(D) AT^2

Q15 The force F is given in terms of time t and displacement x by the equation $\mathrm{F}=\mathrm{A}\cos\mathrm{B}x+\mathrm{C}\sin\mathrm{D}t$. Then the dimensions of $\mathrm{D/B}$ are:
(A) $\mathrm{M^0\ L^0\ T^0}$
(B) $\mathrm{M^0\ L^0\ T^{-1}}$
(C) $\mathrm{M^0\ L^{-1}\ T^0}$
(D) $\mathrm{M^0\ L^1\ T^{-1}}$

Q16 The velocity v of a particle at time t is given by $v=\frac{a}{t}+\frac{bt}{t^2+c}$. The dimensions of a, b, c are respectively
(A) LT^{-1} L, T
(B) L, L, T^2
(C) L, LT, T^{-2}
(D) L, L, LT^2

Q17 In the relation $y=a\cos(\omega t-kx)$, the dimensional formula for k is
(A) $\left[\mathrm{M^0\ L^{-1}\ T^{-1}}\right]$
(B) $\left[\mathrm{M^0LT^{-1}}\right]$
(C) $\left[\mathrm{M^0\ L^{-1}\ T^0}\right]$
(D) $\left[\mathrm{M^0LT}\right]$

Q18 Velocity (V) of object is given as a function of time (t) and position (x),

$$V=\alpha t+\beta x+\gamma$$

then dimension of α, β and γ are:
(A) $[LT^{-2}]$, $[T^{-1}]$, $[LT^{-2}]$
(B) $[LT^{-2}]$, $[T^{-1}]$, $[LT^{-1}]$
(C) $[LT^{-1}]$, $[LT^{-2}]$, $[T^{-1}]$
(D) $[LT^{-1}]$, $[L]$, $[T]$

Q19 Given that the displacement of an oscillating particle is given by $y = A\sin(\mathrm{B}x + \mathrm{C}t + \mathrm{D})$. The dimensional formula for (ABCD) is :

(A) $\left[\mathrm{M}^0\ \mathrm{L}^{-1}\ \mathrm{T}^0\right]$
(B) $\left[\mathrm{M}^0\ \mathrm{L}^0\ \mathrm{T}^{-1}\right]$
(C) $\left[\mathrm{M}^0\ \mathrm{L}^{-1}\ \mathrm{T}^{-1}\right]$
(D) $\left[\mathrm{M}^0\ \mathrm{L}^0\ \mathrm{T}^0\right]$

Q20 A wave is represented by

$$y = a\sin(At - Bx + C)$$

where A, B, C are constants. The Dimensions of A, B, C are:

(A) $T^{-1}, L, M^0L^0T^0$
(B) $T^{-1}, L^{-1}, M^0L^0T^0$
(C) T, L, M
(D) T^{-1}, L^{-1}, M^{-1}

Q21 A force defined by $F = \alpha t^2 + \beta t$ acts on a particle at a given time t. The factor which is dimensionless, if α and β are constants, is:

(A) $\beta t/\alpha$
(B) $\alpha t/\beta$
(C) $\alpha\beta t$
(D) $\alpha\beta/t$

Q22 The force is given in terms of time *t* and displacement *x* by the equation
F = A cos Bx + C sin Dt.
The dimensional formula of $\frac{AD}{B}$ is;

(A) $\left[M^0LT^{-1}\right]$ (B) $\left[ML^2T^{-3}\right]$
(C) $\left[M^1L^1T^{-2}\right]$ (D) $\left[M^2L^2T^{-3}\right]$

Q23 The potential energy U of a particle varies with distance x from a fixed origin as $U = \frac{A\sqrt{x}}{x^2+B}$ where A and B are dimensional constants. The dimensional formula for AB is:

(A) $\mathrm{M}^1\ \mathrm{L}^{7/2}\ \mathrm{T}^{-2}$
(B) $\mathrm{M}^1\ \mathrm{L}^{11/2}\ \mathrm{T}^{-2}$
(C) $\mathrm{M}^1\ \mathrm{L}^{5/2}\ \mathrm{T}^{-2}$
(D) $\mathrm{M}^1\ \mathrm{L}^{9/2}\ \mathrm{T}^{-2}$

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Answer Key

Q1	(D)
Q2	(B)
Q3	(B)
Q4	(D)
Q5	(A)
Q6	(D)
Q7	(A)
Q8	(A)
Q9	(A)
Q10	(A)
Q11	(B)
Q12	(C)
Q13	(D)
Q14	(D)
Q15	(D)
Q16	(B)
Q17	(C)
Q18	(B)
Q19	(B)
Q20	(B)
Q21	(B)
Q22	(B)
Q23	(B)