Yakeen NEET 2.0 2026

Physics By Manish Raj Sir

Units and Measurements

Assignment-01
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1. Amount of solar energy received on the earth's surface per unit area per unit time is defined a solar constant. Dimension of solar constant is **[JEE Main 2020]**

(1) ML^2T^{-2} (2) MLT^{-2}

(3) $M^2L^0T^{-1}$ (4) ML^0T^{-3}

2. Dimensional formula for thermal conductivity is (here K denotes the temperature) **[JEE Main 2020]**

(1) $MLT^{-2}K^{-2}$

(2) $MLT^{-3}K^{-1}$

(3) $MLT^{-3}K$

(4) $MLT^{-2}K$

3. A quantity x is given by (IFv^2/WL^4) in terms of moment of inertia I, force F, velocity v, work W and length L. The dimensional formula for x is same as that of **[JEE Main 2020]**

(1) Coefficient of viscosity

(2) Force constant

(3) Energy density

(4) Planck's constant

4. The quantities $x = \frac{1}{\sqrt{\mu_0\varepsilon_0}}$, $y = \frac{E}{B}$ and $z = \frac{1}{CR}$ are defined where C – capacitance, R – resistance, I – length, E – electric field, B – magnetic field and ε_0, μ_0, – free space permittivity and permeability respectively. Then **[JEE Main 2020]**

(1) Only x and y have the same dimension

(2) Only x and z have the same dimension

(3) x, y and z have the same dimension

(4) Only y and z have the same dimension

5. A quantity f is given by $f = \sqrt{\frac{hc^5}{G}}$ where c is speed of light G universal gravitational constant and h is the Planck's constant. Dimension of f is that of: **[JEE Main 2020]**

(1) Momentum (2) Energy

(3) Force (4) Pressure

6. The work done by a gas molecule in an isolated system is given by, $W = \alpha^2\beta e^{\frac{-Bx^2}{kT}}$, where x is the displacement, k is the Boltzmann constant and T is the temperature, α and β are constants. Then the dimensions of β will be: **[JEE Main 2021]**

(1) $[M^0LT^0]$ (2) $[M^2LT^2]$

(3) $[MLT^{-2}]$ (4) $[ML^2T^{-2}]$

7. Match List-I with List-II:

List-I		List-II	
(A)	h (Planck's constant)	I	$[M\,L\,T^{-1}]$
(B)	E (Kinetic energy)	II	$[M\,L^2\,T^{-1}]$
(C)	V (electric potential)	III	$[M\,L^2\,T^{-2}]$
(D)	P (linear momentum)	IV	$[ML^2I^{-1}T^{-1}]$

Choose the correct answer from the options given below: **[JEE Main 2021]**

(1) (a)-(ii), (b)-(iii), (c)-(iv), (d)-(i)

(2) (a)-(i), (b)-(ii), (c)-(iv), (d)-(iii)

(3) (a)-(iii), (b)-(ii), (c)-(iv), (d)-(i)

(4) (a)-(iii), (b)-(iv), (c)-(ii), (d)-(i)

8. If e is the electronic charged, c is the speed of light in free space and h is Planck's constant, the quantity $\frac{1}{4\pi\varepsilon_0}\frac{|e|^2}{hc}$ has dimensions of: **[JEE Main 2021]**

(1) $[LC^{-1}]$ (2) $[M^0L^0T^0]$

(3) $[MLT^0]$ (4) $[MLT^{-1}]$

9. If a typical combustion engine the work done by a gas molecule is given by $W = \alpha^2\beta e^{\frac{-Bx^2}{kT}}$, where x is the displacement, k is the Boltzmann constant and T is the temperature. If α and β are constants, dimensions of α will be: **[JEE Main 2021]**

(1) $[M^0 LT^0]$ (2) $[M^2 LT^{-2}]$

(3) $[MLT^{-2}]$ (4) $[MLT^{-1}]$

10. The dimension of mutual inductance is: **[JEE Main 2022]**

(1) $[ML^2 T^{-2} A^{-1}]$ (2) $[ML^2 T^{-3} A^{-1}]$

(3) $[ML^2 T^{-2} A^{-2}]$ (4) $[ML^2 T^{-3} A^{-2}]$

11. The SI unit of a physical quantity is pascal-second. The dimensional formula of this quantity will be **[JEE Main 2022]**

(1) $[ML^{-1} T^{-1}]$ (2) $[ML^{-1} T^{-2}]$

(3) $[ML^2 T^{-1}]$ (4) $[M^{-1} L^3 T^0]$

12. If L, C and R are the self inductance, capacitance and resistance respectively, which of the following does not have the dimension of time? **[JEE Main 2022]**

(1) RC (2) $\frac{L}{R}$

(3) $\sqrt{LC}$ (4) $\frac{L}{C}$

13. In Vander Waals equation $\left[P+\frac{a}{V^2}\right][V-b]=RT$; P is pressure, V is volume, R is universal gas constant and T is temperature. The ratio of constants $\frac{a}{b}$ is dimensionally equal to: **[JEE Main 2022]**

(1) $\frac{P}{V}$ (2) $\frac{V}{P}$

(3) PV (4) PV^3

14. Dimension of $\frac{1}{\mu_0\varepsilon_0}$ should be equal to **[JEE Main 2023]**

(1) $L T^{-1}$ (2) $T^2 L^{-2}$

(3) $L^2 T^{-2}$ (4) $T L^{-1}$

15. Match List I with List II **[JEE Main 2023]**

List-I		List-II	
(A)	Torque	I	$M L^{-2} T^{-2}$
(B)	Stress	II	$M L^2 T^{-2}$
(C)	Pressure gradient	III	$M L^{-1} T^{-1}$
(D)	Coefficient of viscosity	IV	$M L^{-1} T^{-2}$

Choose the correct answer from the options given below:

(1) A-I, B-III, C-II, D-IV

(2) A-IV, B-I, C-III, D-II

(3) A-II, B-I, C-IV, D-III

(4) A-II, B-III, C-I, D-IV

16. Match List I with List II **[JEE Main 2023]**

List-I		List-II	
(A)	Spring constant	I	$[T^{-1}]$
(B)	Angular speed	II	$[MT^{-2}]$
(C)	Angular momentum	III	$[ML^2]$
(D)	Moment of inertia	IV	$[ML^2T^{-1}]$

Choose the correct answer from the options given below:

(1) A-I, B-III, C-II, D-IV

(2) A-IV, B-I, C-III, D-II

(3) A-II, B-I, C-IV, D-III

(4) A-II, B-III, C-I, D-IV

17. In the equation $\left[X+\frac{a}{Y^2}\right][Y-b]=RT$, X is pressure, Y is volume, R is universal gas constant and T is temperature. The physical quantity equivalent to the ratio $\frac{a}{b}$ is: **[JEE Main 2023]**

(1) Pressure gradient

(2) Energy

(3) Impulse

(4) Coefficient of viscosity

18. Match List I with List II **[JEE Main 2023]**

List-I		List-II	
(A)	Young's Modulus (Y)	I	[M L^{-1} T^{-1}]
(B)	Co-efficient of Viscosity (η)	II	[M L T^{-1}]
(C)	Planck's constant (h)	III	[M L^{-1} T^{-2}]
(D)	Work function (ϕ)	IV	[M L^2 T^{-2}]

Choose the correct answer from the options given below:

(1) A-II, B-III, C-V, D-I

(2) A-III, B-I, C-II, D-IV

(3) A-I, B-III, C-IV, D-II

(4) A-I, B-II, C-III, D-IV

19. The equation of stationary wave is:

$$y = 2a\sin\left(\frac{2\pi nt}{\lambda}\right)\cos\left(\frac{2\pi x}{\lambda}\right)$$

Which of the following is not correct: **[JEE Main 2024]**

(1) The dimensions of n/λ is [T]

(2) The dimensions of n is [LT^{-1}]

(3) The dimensions of x is [L]

(4) The dimensions of nt is [L]

20. What is the dimensional formula of ab^{-1} in the equation $\left(P+\frac{a}{V^2}\right)(V-b)=RT$, where letters have their usual meaning. **[JEE Main 2024]**

(1) [M^{-1} L^5 T^3] (2) [M^6 L^7 T^4]

(3) [ML^2 T^{-2}] (4) [M^0 L^3 T^{-2}]

21. If ε_0 is the permittivity of free space and E is the electric field, then $\varepsilon_0 E^2$ has the dimensions: **[JEE Main 2024]**

(1) [M^{-1} L^{-3} T^4 A^2]

(2) [ML^2 T^{-2}]

(3) [M^0 L^{-2} TA]

(4) [ML^{-1} T^{-2}]

22. The dimensional formula of latent heat is: **[JEE Main 2024]**

(1) [ML^2 T^{-2}] (2) [M^0 L^2 T^{-2}]

(3) [MLT^{-2}] (4) [ML^2 T^{-2}]

23. The equation of state of a real gas is given by $\left(P+\frac{a}{V^2}\right)(V-b)=RT$, where P, V and T are pressure. Volume and temperature respectively and R is the universal gas constant. The dimensions of $\frac{a}{b^2}$ is similar to that of: **[JEE Main 2024]**

(1) PV (2) P

(3) RT (4) R

24. A force is represented by $F = ax^2 + bt^{1/2}$. Where x = distance and t = time. The dimensions of b^2/a are: **[JEE Main 2024]**

(1) [ML^{3}T^{-3}] (2) [MLT^{-2}]

(3) [ML^{-1}T^{-1}] (4) [ML^{2}T^{-3}]

25. The position of a particle moving on x-axis is given by $x(t) = A \sin t + B \cos^2 t + Ct^2 + D$, where t is time. The dimension of $\frac{ABC}{D}$ is **[JEE Main 2025]**

(1) L^2 T^{-2} (2) L^2

(3) L (4) L^3 T^{-2}

26. The electric flux is $\phi = \alpha\sigma + \beta\lambda$ where λ and σ are linear and surface charge density, respectively. $\left(\frac{\alpha}{\beta}\right)$ represents **[JEE Main 2025]**

(1) electric field

(2) area

(3) charge

(4) displacement

27. The expression given below shows the variation of velocity (v) with time (t), $v = At^2 + \frac{Bt}{C+t}$. The dimension of ABC is: **[JEE Main 2025]**

(1) [M^0 L^2 T^{-2}]

(2) [M^0 L^1 T^{-3}]

(3) [M^0 L^1 T^{-2}]

(4) [M^0 L^2 T^{-3}]

28. Match List-I with List-II **[JEE Main 2025]**

List-I		List-II	
(A)	Boltzmann constant	I	ML^2T^{-1}
(B)	Coefficient of viscosity	II	$MLT^{-3}K^{-1}$
(C)	Planck's constant	III	$ML^2\ T^{-2}\ K^{-1}$
(D)	Thermal conductivity	IV	$ML^{-1}\ T^{-1}$

Choose the correct answer from the options given below:

(1) A-III, B-IV, C-I, D-II

(2) A-II, B-III, C-IV, D-I

(3) A-III, B-II, C-I, D-IV

(4) A-III, B-IV, C-II, D-I

29. The dimension of $\sqrt{\frac{\mu_0}{\epsilon_0}}$ is equal to that of:

(μ_0 = Vacuum permeability and ϵ_0 = Vacuum permittivity) **[JEE Main 2025]**

(1) Voltage (2) Capacitance

(3) Inductance (4) Resistance

30. Match List-I with List-II **[JEE Main 2025]**

List-I		List-II	
(A)	Mass density	I	$[ML^2\ T^{-3}]$
(B)	Impulse	II	$[MLT^{-1}]$
(C)	Power	III	$[ML^2T^0]$
(D)	Moment of inertia	IV	$[ML^{-3}T^0]$

Choose the correct answer from the options given below:

(1) A-IV, B-II, C-III, D-I

(2) A-I, B-III, C-IV, D-II

(3) A-IV, B-II, C-I, D-III

(4) A-II, B-III, C-IV, D-I

ANSWER KEY

1.	(4)	11.	(1)	21.	(4)
2.	(2)	12.	(4)	22.	(2)
3.	(3)	13.	(3)	23.	(2)
4.	(3)	14.	(3)	24.	(1)
5.	(2)	15.	(3)	25.	(1)
6.	(3)	16.	(3)	26.	(4)
7.	(1)	17.	(2)	27.	(4)
8.	(2)	18.	(2)	28.	(1)
9.	(1)	19.	(1)	29.	(4)
10.	(3)	20.	(3)	30.	(3)

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