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NEET UNITS AND MEASUREMENTS — PYQS

Max. Marks: 200 **Questions:** 50

Section A (MCQ) — 50 questions

Q.1 The speed of light in vacuum is taken as unity. If light takes 6 min 40 s to reach the Earth from the Sun, the distance between the Sun and the Earth in new unit is : [NEET (UG) 2026]

(1) 3×10^8 (2) 500 (3) 3×10^{10} (4) 400

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Q.2 In a vernier callipers, 20 VSD coincide with 16 MSD (each division of length 1 mm). The least count of the vernier callipers is : [NEET (UG) 2026]

(1) 0.2 cm (2) 0.1 cm (3) 0.02 cm (4) 0.01 cm

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Q.3 Each side of a metallic cube of mass 5.580 kg is measured to be 9.0 cm. Keeping the significant figures in view, the density of the material of the cube can be best expressed as $X \times 10^3$ kg m^{-3}, where the value of X is : [NEET (UG) 2026]

(1) 7.654 (2) 7.7 (3) 7.65 (4) 7.6

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Q.4 Consider that σ_s, k_B, b represents Stefan-Boltzmann constant, Boltzmann constant and Wien's displacement law constant, respectively. The dimension of $\sigma_s k_B^{-1} b$ is [RE-NEET (UG) 2026]

(1) $[L^{-1}T^{-1}K^{-4}]$ (2) $[L^{-1}T^{-1}K^{-2}]$

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

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Q.5 One main scale division of a Vernier calliper is equal to 1 mm and the number of divisions on the Vernier scale is 10. When both the jaws touch each other, the Vernier scale shifts to the left of zero of the main scale in such a way that 4th Vernier division coincides with a division of the main scale. If this Vernier calliper measures the length of the wire to be 1 cm, the actual length of the wire is : [RE-NEET (UG) 2026]

(1) 1.04 cm (2) 0.60 cm (3) 0.96 cm (4) 1.00 cm

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Q.6 A physical quantity P is related to four observations a, b, c and d as follows:

$P = a^3b^2/c\sqrt{d}$

The percentage errors of measurement in a, b, c and d are 1%, 3%, 2%, and 4% respectively. The percentage error in the quantity P is [NEET (UG) 2025]

(1) 13% (2) 15% (3) 10% (4) 2%

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Q.7 Consider the diameter of a spherical object being measured with the help of a Vernier callipers. Suppose its 10 Vernier Scale Divisions (V.S.D.) are equal to its 9 Main Scale Divisions (M.S.D.). The least division in the M.S. is 0.1 cm and the zero of V.S. is at x = 0.1 cm when the jaws of Vernier callipers are closed. If the main scale reading for the diameter is M = 5 cm and the number of coinciding vernier division is 8, the measured diameter after zero error correction, is [NEET (UG) 2025]

(1) 4.98 cm (2) 5.00 cm (3) 5.18 cm (4) 5.08 cm

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Q.8 In a vernier callipers, (N + 1) divisions of vernier scale coincide with N divisions of main scale. If 1 MSD represents 0.1 mm, the vernier constant (in cm) is: [NEET (UG) 2024]

(1) $\frac{1}{10N}$ (2) $\frac{1}{100(N+1)}$

(3) 100N (4) 10(N + 1)

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Q.9 The quantities which have the same dimensions as those of solid angle are: [NEET (UG) 2024]

(1) strain and angle

(2) stress and angle

(3) strain and arc

(4) angular speed and stress

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Q.10 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: [NEET (UG) 2024]

(1) $\beta t/\alpha$ (2) $\alpha t/\beta$ (3) $\alpha\beta t$ (4) $\alpha\beta/t$

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Q.11 In an electrical circuit, the voltage is measured as V = (200 ± 4) volt and the current is measured as I = (20 ± 0.2) A. The value of the resistance is: [RE-NEET (UG) 2024]

(1) (10 ± 4.2) Ω (2) (10 ± 0.3) Ω
(3) (10 ± 0.1) Ω (4) (10 ± 0.8) Ω

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Q.12 The pitch of an error free screw gauge is 1 mm and there are 100 divisions on the circular scale. While measuring the diameter of a thick wire, the pitch scale reads 1 mm and 63rd division on the circular scale coincides with the reference line. The diameter of the wire is: [RE-NEET (UG) 2024]

(1) 1.63 cm (2) 0.163 cm
(3) 0.163 m (4) 1.63 m

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Q.13 The potential energy of a particle moving along x-direction varies as $V = \frac{Ax^2}{\sqrt{x} + B}$. The dimensions of $\frac{A^2}{B}$ are: [RE-NEET (UG) 2024]

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

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Q.14 The errors in the measurement which arise due to unpredictable fluctuations in temperature and voltage supply are : [NEET (UG) 2023]

(1) Personal errors (2) Least count errors
(3) Random errors (4) Instrumental errors

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Q.15 A metal wire has mass (0.4 ± 0.002) g, radius (0.3 ± 0.001) mm and length (5 ± 0.02) cm. The maximum possible percentage error in the measurement of density will nearly be : [NEET (UG) 2023]

(1) 1.3% (2) 1.6% (3) 1.4% (4) 1.2%

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Q.16 The dimensions $[MLT^{-2}A^{-2}]$ belong to the [NEET (UG) 2022]

(1) Magnetic flux
(2) Self inductance
(3) Magnetic permeability
(4) Electric permittivity

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Q.17 Plane angle and solid angle have [NEET (UG) 2022]

(1) Units but no dimensions
(2) Dimensions but no units
(3) No units and no dimensions
(4) Both units and dimensions

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Q.18 The area of a rectangular field (in m^2) of length 55.3 m and breadth 25 m after rounding off the value for correct significant digits is [NEET (UG) 2022]

(1) 138×10^1 (2) 1382
(3) 1382.5 (4) 14×10^2

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Q.19 The physical quantity that has the same dimensional formula as pressure is [NEET (UG) 2022 (Phase 2)]

(1) Coefficient of viscosity
(2) Force
(3) Momentum
(4) Young's modulus of elasticity

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Q.20 The percentage error in the measurement of g is : (Given that $g = \frac{4\pi^2 L}{T^2}$, L = (10 ± 0.1) cm, T = (100 ± 1) s) [NEET (UG) 2022 (Phase 2)]

(1) 7% (2) 2% (3) 5% (4) 3%

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Q.21 If E and G respectively denote energy and gravitational constant, then $\frac{E}{G}$ has the dimensions of : [NEET (UG) 2021]

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

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Q.22 Dimensions of stress are : [NEET (UG) 2020]

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

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Q.23 A screw gauge gives the following readings when used to measure the diameter of a wire
Main scale reading : 0 mm
Circular scale reading : 52 divisions
Given that 1 mm on main scale corresponds to 100 divisions on the circular scale. The diameter of the wire from the above data is : [NEET (UG) 2021]

(1) 0.052 cm (2) 0.52 cm
(3) 0.026 cm (4) 0.26 cm

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Q.24 If force [F], acceleration [A] and time [T] are chosen as the fundamental physical quantities. Find the dimensions of energy. [NEET (UG) 2021]

(1) $[F][A^{-1}][T]$ (2) $[F][A][T]$
(3) $[F][A][T^2]$ (4) $[F][A][T^{-1}]$

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Q.25 A screw gauge has least count of 0.01 mm and there are 50 divisions in its circular scale.
The pitch of the screw gauge is : [NEET (UG) 2020]

(1) 0.25 mm (2) 0.5 mm
(3) 1.0 mm (4) 0.01 mm

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Q.26 Taking into account of the significant figures, what is the value of 9.99 m − 0.0099 m? [NEET (UG) 2020]

(1) 9.98 m (2) 9.980 m (3) 9.9 m (4) 9.9801 m

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Q.27 In an experiment, the percentage of error occurred in the measurement of physical quantities A, B, C and D are 1%, 2%, 3% and 4% respectively. Then the maximum percentage of error in the measurement X, where

$X = \frac{A^2B^{1/2}}{C^{1/3}D^3}$, will be : [NEET (UG) 2019]

(1) 16% (2) −10% (3) 10% (4) $\left(\frac{3}{13}\right)\%$

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Q.28 A student measured the diameter of a small steel ball using a screw gauge of least count 0.001 cm. The main scale reading is 5 mm and zero of circular scale division coincides with 25 divisions above the reference level. If screw gauge has a zero error of −0.004 cm, the correct diameter of the ball is [NEET 2018]

(1) 0.521 cm (2) 0.525 cm
(3) 0.053 cm (4) 0.529 cm

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Q.29 A physical quantity of the dimensions of length that can be formed out of c, G and $\frac{e^2}{4\pi\varepsilon_0}$ is [c is velocity of light, G is the universal constant of gravitation and e is charge] [NEET 2017]

(1) $c^2\left[G\frac{e^2}{4\pi\varepsilon_0}\right]^{1/2}$ (2) $\frac{1}{c^2}\left[\frac{e^2}{G\,4\pi\varepsilon_0}\right]^{1/2}$
(3) $\frac{1}{c}G\frac{e^2}{4\pi\varepsilon_0}$ (4) $\frac{1}{c^2}\left[G\frac{e^2}{4\pi\varepsilon_0}\right]^{1/2}$

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Q.30 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 ? [NEET 2016 (Phase 2)]

(1) $\frac{\sqrt{hG}}{c^{3/2}}$ (2) $\frac{\sqrt{hG}}{c^{5/2}}$ (3) $\sqrt{\frac{hc}{G}}$ (4) $\sqrt{\frac{Gc}{h^{3/2}}}$

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Q.31 If dimensions of critical velocity v_c of a liquid flowing through a tube 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 values of x, y and z are given by [AIPMT 2015]

(1) −1, − 1, − 1 (2) 1, 1, 1
(3) 1, − 1, − 1 (4) −1, − 1, 1

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Q.32 If energy (E), velocity (V) and time (T) are chosen as the fundamental quantities, the dimensional formula of surface tension will be [AIPMT 2015 (Cancelled)]

(1) $[EV^{-2}T^{-2}]$ (2) $[E^{-2}V^{-1}T^{-3}]$
(3) $[EV^{-2}T^{-1}]$ (4) $[EV^{-1}T^{-2}]$

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Q.33 If force (F), velocity (V) and time (T) are taken as fundamental units, then dimensions of mass are [AIPMT 2014]

(1) $[FVT^{-1}]$ (2) $[FVT^{-2}]$
(3) $[FV^{-1}T^{-1}]$ (4) $[FV^{-1}T]$

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Q.34 In an experiment four quantities a, b, c and d are measured with percentage error 1%, 2%, 3% and 4% respectively.

Quantity P is calculated as follows $P = \frac{a^3b^2}{cd}$. % error in P is [NEET 2013]

(1) 7% (2) 4% (3) 14% (4) 10%

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Q.35 The pair of quantities having same dimensions is [NEET 2013 (Karnataka)]

(1) Impulse and Surface Tension
(2) Angular momentum and Work
(3) Work and Torque
(4) Young's modulus and Energy

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Q.36 The dimensions of $(\mu_0\varepsilon_0)^{-1/2}$ are [AIPMT 2012 (Mains)]

(1) $[L^{1/2}T^{-1/2}]$ (2) $[L^{-1}T]$
(3) $[LT^{-1}]$ (4) $[L^{1/2}T^{1/2}]$

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Q.37 The damping force on an oscillator is directly proportional to the velocity. The units of the constant of proportionality are [AIPMT 2012 (Prelims)]

(1) kg m s^{-1} (2) kg m s^{-2} (3) kg s^{-1} (4) kg s

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Q.38 The density of a material in CGS system of units is 4 g cm^{-3}. In a system of units in which unit of length is 10 cm and unit of mass is 100 g, the value of density of material will be [AIPMT 2011 (Mains)]

(1) 0.04 (2) 0.4 (3) 40 (4) 400

Scan or tap for the full solution

Q.39 The dimensions of $(\mu_0\varepsilon_0)^{-1/2}$ are [AIPMT 2011 (Prelims)]

(1) $[L^{1/2}T^{-1/2}]$ (2) $[L^{-1}T]$
(3) $[LT^{-1}]$ (4) $[L^{1/2}T^{1/2}]$

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Q.40 A student measures the distance traversed in free fall of a body, initially at rest, in a given time. He uses this data to estimate g, the acceleration due to gravity. If the maximum percentage errors in measurement of the distance and the time are e_1 and e_2 respectively, the percentage error in the estimation of g is [AIPMT 2010 (Mains)]

(1) $e_2 - e_1$ (2) $e_1 + 2e_2$ (3) $e_1 + e_2$ (4) $e_1 - 2e_2$

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Q.41 The dimension of $\frac{1}{2}\varepsilon_0 E^2$, where ε_0 is permittivity of free space and E is electric field, is [AIPMT 2010 (Prelims)]

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

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Q.42 If the dimensions of a physical quantity are given by $M^aL^bT^c$, then the physical quantity will be [AIPMT 2009]

(1) velocity if a = 1, b = 0, c = −1
(2) acceleration if a = 1, b = 1, c = −2
(3) force if a = 0, b = −1, c = −2
(4) pressure if a = 1, b = −1, c = −2

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Q.43 If the error in the measurement of radius of a sphere is 2%, then the error in the determination of volume of the sphere will be [AIPMT 2008]

(1) 8% (2) 2% (3) 4% (4) 6%

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Q.44 Which two of the following five physical parameters have the same dimensions ?

1. Energy density
2. Refractive index
3. Dielectric constant
4. Young's modulus
5. Magnetic field

[AIPMT 2008]

(1) 1 and 4 (2) 1 and 5 (3) 2 and 4 (4) 3 and 5

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Q.45 Dimensions of resistance in an electrical circuit, in terms of dimension of mass M, of length L, of time T and of current I, would be [AIPMT 2007]

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

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Q.46 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 and c are [AIPMT 2006]

(1) [L], [LT] and $[LT^{-2}]$ (2) $[LT^{-2}]$, [L] and [T]
(3) $[L^2]$, [T] and $[LT^{-2}]$ (4) $[LT^{-2}]$, [LT] and [L]

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Q.47 The ratio of the dimensions of Planck's constant and that of moment of inertia is the dimensions of [AIPMT 2005]

(1) time (2) frequency
(3) angular momentum (4) velocity

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Q.48 The dimensions of universal gravitational constant are [AIPMT 2004]

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

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Q.49 The dimensions of Planck's constant are equal to those of [AIPMT 2001]

(1) energy (2) momentum
(3) angular momentum (4) power

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Q.50 Which pair does not have equal dimensions? [AIPMT 2000]

(1) Energy and torque
(2) Force and impulse
(3) Angular momentum and Planck constant
(4) Elastic modulus and pressure

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ANSWER KEY

Ques.	1	2	3	4	5	6	7	8	9	10	11
Ans.	**4**	**3**	**2**	**2**	—	**1**	**1**	**2**	**1**	**2**	**2**
Ques.	12	13	14	15	16	17	18	19	20	21	22
Ans.	**2**	**3**	**3**	**2**	**3**	**1**	**4**	**4**	**4**	**2**	**3**
Ques.	23	24	25	26	27	28	29	30	31	32	33
Ans.	**1**	**3**	**2**	**1**	**1**	**4**	**4**	**1**	**3**	**1**	**4**
Ques.	34	35	36	37	38	39	40	41	42	43	44
Ans.	**3**	**3**	**3**	**3**	**3**	**3**	**2**	**2**	**4**	**4**	**1**
Ques.	45	46	47	48	49	50					
Ans.	**3**	**2**	**2**	**1**	**3**	**2**					