

Mastering Physics With Physics Guruji

DPP - Daily Practice Problems

Chapter-wise Sheets

Date : Start Time : End Time :

PHYSICS

CP01

SYLLABUS : Physical World, Units & Measurements

Max. Marks : 120 Marking Scheme : (+4) for correct & (-1) for incorrect answer Time : 60 min.

INSTRUCTIONS : This Daily Practice Problem Sheet contains 30 MCQs. For each question only one option is correct. Darken the correct circle/ bubble in the Response Grid provided on each page.

- A and B have different dimensions. Then which of the following relation will be meaningful?
(a) $\left[\frac{A}{B}\right]$ (b) $[A-B]$
(c) $[A+B]$ (d) $[e^{A/B}]$
- N divisions on the main scale of a vernier calliper coincide with $(N+1)$ divisions of the vernier scale. If each division of main scale is 'a' units, then the least count of the instrument is
(a) a (b) $\frac{a}{N}$
(c) $\frac{N}{N+1} \times a$ (d) $\frac{a}{N+1}$
- Young's modulus of a material has the same unit as
(a) pressure
(b) strain
(c) compressibility
(d) force
- The time period of a body under S.H.M. is represented by: $T = P^a D^b S^c$ where P is pressure, D is density and S is surface tension, then values of a, b and c are
(a) $-\frac{3}{2}, \frac{1}{2}, 1$ (b) $-1, -2, 3$
(c) $\frac{1}{2}, -\frac{3}{2}, -\frac{1}{2}$ (d) $1, 2, \frac{1}{3}$

RESPONSE GRID

1. (a)(b)(c)(d) 2. (a)(b)(c)(d) 3. (a)(b)(c)(d) 4. (a)(b)(c)(d)

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5. In the eqn. $\left(P + \frac{a}{V^2}\right)(V - b) = \text{constant}$, the unit of a is
 (a) dyne cm^5 (b) dyne cm^4
 (c) dyne/ cm^3 (d) dyne cm^2
6. The mass and volume of a body are found to be 5.00 ± 0.05 kg and 1.00 ± 0.05 m^3 respectively. Then the maximum possible percentage error in its density is
 (a) 6% (b) 3%
 (c) 10% (d) 5%
7. The density of material in CGS system of units is $4\text{g}/\text{cm}^3$. 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
 (a) 0.4 unit (b) 40 unit
 (c) 400 unit (d) 0.04 unit
8. Of the following quantities, which one has dimensions different from the remaining three?
 (a) Energy per unit volume
 (b) Force per unit area
 (c) Product of voltage and charge per unit volume
 (d) Angular momentum
9. The percentage error in measuring M, L and T are 1%, 1.5% and 3% respectively. Then the percentage error in measuring the physical quantity with dimensions $\text{ML}^{-1} \text{T}^{-1}$ is
 (a) 1% (b) 3.5%
 (c) 3% (d) 5.5%
10. The unit of permittivity of free space, ϵ_0 is
 (a) coulomb²/newton-metre²
 (b) coulomb/newton-metre
 (c) newton-metre²/coulomb²
 (d) coulomb²/newton-metre²
11. If E, m, J and G represent energy, mass, angular momentum and gravitational constant respectively, then the dimensional formula of $\text{EJ}^2/\text{m}^5\text{G}^2$ is same as that of the
 (a) angle (b) length
 (c) mass (d) time
12. The current voltage relation of a diode is given by $I = (e^{1000V/T} - 1)\text{mA}$, where the applied voltage V is in volts and the temperature T is in degree kelvin. If a student makes an error measuring ± 0.01 V while measuring the current of 5 mA at 300 K, what will be the error in the value of current in mA?
 (a) 0.2 mA (b) 0.02 mA
 (c) 0.5 mA (d) 0.05 mA
13. The unit of impulse is the same as that of
 (a) energy (b) power
 (c) momentum (d) velocity
14. A student measured the length of a rod as 3.50 cm. Which instrument did he use to measure it?
 (a) A meter scale
 (b) A vernier calliper where the 10 divisions in vernier scale matches with 9 divisions in main scale and main scale has 10 divisions in 1 cm
 (c) A screw gauge having 100 divisions in the circular scale and pitch as 1 mm
 (d) A screw gauge having 50 divisions in the circular scale and pitch as 1 mm
15. Weber is the unit of
 (a) magnetic susceptibility
 (b) intensity of magnetisation
 (c) magnetic flux
 (d) magnetic permeability
16. An object is moving through the liquid. The viscous damping force acting on it is proportional to the velocity. Then dimensions of constant of proportionality are
 (a) $[\text{ML}^{-1}\text{T}^{-1}]$ (b) $[\text{MLT}^{-1}]$
 (c) $[\text{M}^0\text{LT}^{-1}]$ (d) $[\text{ML}^0\text{T}^{-1}]$

RESPONSE
GRID

- | | | | | |
|------------------|------------------|------------------|------------------|------------------|
| 5. (a)(b)(c)(d) | 6. (a)(b)(c)(d) | 7. (a)(b)(c)(d) | 8. (a)(b)(c)(d) | 9. (a)(b)(c)(d) |
| 10. (a)(b)(c)(d) | 11. (a)(b)(c)(d) | 12. (a)(b)(c)(d) | 13. (a)(b)(c)(d) | 14. (a)(b)(c)(d) |
| 15. (a)(b)(c)(d) | 16. (a)(b)(c)(d) | | | |

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17. Two full turns of the circular scale of a screw gauge cover a distance of 1mm on its main scale. The total number of divisions on the circular scale is 50. Further, it is found that the screw gauge has a zero error of -0.03 mm. While measuring the diameter of a thin wire, a student notes the main scale reading of 3 mm and the number of circular scale divisions in line with the main scale as 35. The diameter of the wire is
- (a) 3.32 mm (b) 3.73 mm
(c) 3.67 mm (d) 3.38 mm
18. The SI unit of electric flux is
- (a) Cm^{-2} (b) coulomb
(c) ampere (d) volt metre
19. If Q denote the charge on the plate of a capacitor of capacitance C then the dimensional formula for $\frac{Q^2}{C}$ is
- (a) $[\text{L}^2\text{M}^2\text{T}]$ (b) $[\text{LMT}^2]$
(c) $[\text{L}^2\text{MT}^{-2}]$ (d) $[\text{L}^2\text{M}^2\text{T}^2]$
20. The respective number of significant figures for the numbers 23.023, 0.0003 and 2.1×10^{-3} are
- (a) 5, 1, 2 (b) 5, 1, 5
(c) 5, 5, 2 (d) 4, 4, 2
21. The dimensions of mobility are
- (a) $\text{M}^{-2}\text{T}^2\text{A}$ (b) $\text{M}^{-1}\text{T}^2\text{A}$
(c) $\text{M}^{-2}\text{T}^3\text{A}$ (d) $\text{M}^{-1}\text{T}^3\text{A}$
22. The physical quantities not having same dimensions are
- (a) torque and work
(b) momentum and Planck's constant
(c) stress and Young's modulus
(d) speed and $(\mu_0\epsilon_0)^{-1/2}$
23. 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 $P = \frac{a^3b^2}{cd}$ % error in P is
- (a) 10% (b) 7%
(c) 4% (d) 14%
24. The density of a solid ball is to be determined in an experiment. The diameter of the ball is measured with a screw gauge, whose pitch is 0.5 mm and there are 50 divisions on the circular scale. The reading on the main scale is 2.5 mm and that on the circular scale is 20 divisions. If the measured mass of the ball has a relative error of 2%, the relative percentage error in the density is
- (a) 0.9% (b) 2.4%
(c) 3.1% (d) 4.2%
25. A quantity X is given by $\epsilon_0 L \frac{\Delta V}{\Delta t}$ where ϵ_0 is the permittivity of the free space, L is a length, ΔV is a potential difference and Δt is a time interval. The dimensional formula for X is the same as that of
- (a) resistance (b) charge
(c) voltage (d) current
26. In a simple pendulum experiment, the maximum percentage error in the measurement of length is 2% and that in the observation of the time-period is 3%. Then the maximum percentage error in determination of the acceleration due to gravity g is
- (a) 5% (b) 6%
(c) 1% (d) 8%

RESPONSE
GRID

17. (a) (b) (c) (d) 18. (a) (b) (c) (d) 19. (a) (b) (c) (d) 20. (a) (b) (c) (d) 21. (a) (b) (c) (d)
22. (a) (b) (c) (d) 23. (a) (b) (c) (d) 24. (a) (b) (c) (d) 25. (a) (b) (c) (d) 26. (a) (b) (c) (d)

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27. The dimensions of $\frac{1}{\epsilon_0} \frac{e^2}{hc}$ are
- (a) $M^{-1} L^{-3} T^4 A^2$ (b) $ML^3 T^{-4} A^{-2}$
 (c) $M^0 L^0 T^0 A^0$ (d) $M^{-1} L^{-3} T^2 A$
28. If the capacitance of a nanocapacitor is measured in terms of a unit 'u' made by combining the electric charge 'e', Bohr radius 'a₀', Planck's constant 'h' and speed of light 'c' then
- (a) $u = \frac{e^2 h}{a_0}$ (b) $u = \frac{hc}{e^2 a_0}$
 (c) $u = \frac{e^2 c}{ha_0}$ (d) $u = \frac{e^2 a_0}{hc}$
29. In an experiment the angles are required to be measured using an instrument, 29 divisions of the main scale exactly coincide with the 30 divisions of the vernier scale. If the smallest division of the main scale is half-a degree (= 0.5°), then the least count of the instrument is :
- (a) halfminute (b) one degree
 (c) half degree (d) one minute
30. A physical quantity of the dimensions of length that can be formed out of c, G and $\frac{e^2}{4\pi\epsilon_0}$ is [c is velocity of light, G is universal constant of gravitation and e is charge]
- (a) $c^2 \left[G \frac{e^2}{4\pi\epsilon_0} \right]^{1/2}$ (b) $\frac{1}{c^2} \left[\frac{e^2}{G4\pi\epsilon_0} \right]^{1/2}$
 (c) $\frac{1}{c} G \frac{e^2}{4\pi\epsilon_0}$ (d) $\frac{1}{c^2} \left[G \frac{e^2}{4\pi\epsilon_0} \right]^{1/2}$

RESPONSE GRID

27. (a)(b)(c)(d) 28. (a)(b)(c)(d) 29. (a)(b)(c)(d) 30. (a)(b)(c)(d)

DAILY PRACTICE PROBLEM DPP CHAPTERWISE CP01 - PHYSICS

Total Questions	30	Total Marks	120
Attempted		Correct	
Incorrect		Net Score	
Cut-off Score	45	Qualifying Score	60
Success Gap = Net Score – Qualifying Score			
Net Score = (Correct × 4) – (Incorrect × 1)			

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