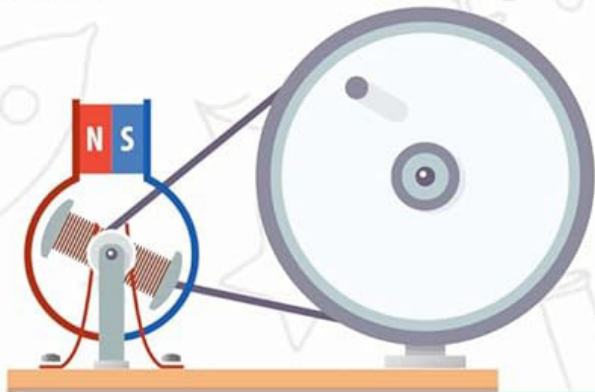


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Free Sample Contents

1. General Physics

P1-6

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DPP - Daily Practice Problems

Chapter-wise Sheet

Date : _____ Start Time : _____ End Time : _____

PHYSICS

**SYLLABUS : General Physics
(Level 1)**

CP01L1

Max. Marks : 100

Time : 60 min.

INSTRUCTIONS : This Daily Practice Problem Sheet contains 30 Questions divided into 2 parts.

Part-I contains 20 MCQs with only one correct option. Darken the correct circle/ bubble in the Response Grid provided on each page.

Marking Scheme : (+4) for correct & (-1) for incorrect answer and zero for unattempted.

Part-II contains 10 Numeric/Integer type Questions, 5 to be attempted. Mark your answer in the box provided in the Response Grid.

Marking Scheme : (+4) for correct & (0) for incorrect answer and zero for unattempted.

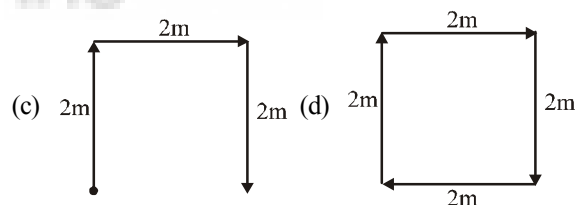
Remedial Measures after Level 1 for both the Levels.

Score Calculator after Level 2 for both the Levels.

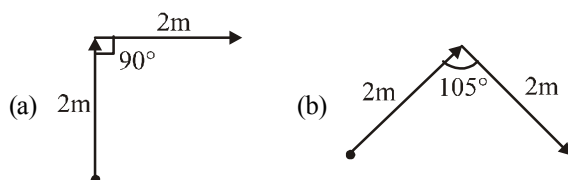
PART-I : Multiple Choice Questions (MCQs)

1. Maximum and minimum magnitudes of the resultant of two vectors of magnitudes P and Q are in the ratio 3 : 1. Which of the following relation is true ($P > Q$):- **E**

- (a) $P=2Q$ (b) $P=Q$
(c) $PQ=1$ (d) None of these



2. Which vector diagram represents the greatest magnitude of displacement for an object? **B**



3. The velocity of a particle is $\vec{v} = 6\hat{i} + 2\hat{j} - 2\hat{k}$. The component of the velocity of this particle parallel to vector $\vec{a} = \hat{i} + \hat{j} + \hat{k}$ is:- **D**

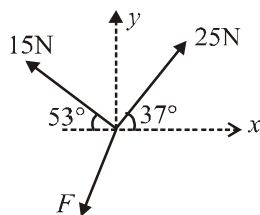
- (a) $6\hat{i} + 2\hat{j} + 2\hat{k}$ (b) $2\hat{i} + 2\hat{j} + 2\hat{k}$
(c) $\hat{i} + \hat{j} + \hat{k}$ (d) $6\hat{i} + 2\hat{j} - 2\hat{k}$

RESPONSE GRID

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

Space for Rough Work

4. Three forces are acting on an object as shown in diagram. Their resultant is zero. Then \vec{F} is :-



- (a) $-11\hat{i} - 27\hat{j}$ (b) $-20\hat{i} - 27\hat{j}$
 (c) $11\hat{i} - 3\hat{j}$ (d) $20\hat{i} - 3\hat{j}$
5. The speed of waves on the surface of the ocean is supposed to depend on the density ρ of the water, the gravitational acceleration g , and the wavelength of the waves λ . The speed of ocean waves is then expected to be proportional to

- (a) $\sqrt{\rho\lambda g}$ (b) $\sqrt{\lambda g / \rho}$
 (c) $\sqrt{\lambda g}$ (d) $\sqrt{g / \lambda}$

6. If force $F = ax + bt^2 + c$, x is distance and t is time, find dimensions of $\frac{axc}{bt^2}$.
- (a) ML^2T^{-2} (b) MLT^{-2}
 (c) $M^0L^0T^0$ (d) MLT^{-1}

7. At what angle do the force $(\vec{P} + \vec{Q})$ and $(\vec{P} - \vec{Q})$ act so that resultant is $\sqrt{3P^2 + Q^2}$? (Take : $\sin 37^\circ = 0.6$)
- (a) 30° (b) 37°
 (c) 53° (d) 60°

8. A person walks 80 m east, then turns right through angle 143° , walks further 50 m and stops. His position relative to the starting point is
- (a) 50 m, 53° east of south
 (b) 50 m, 53° south of east
 (c) 30 m, 37° south of east
 (d) 30 m, 53° south of east

9. A screw gauge has a screw having 2 threads in 1 mm. The circular scale has 50 divisions. Find the diameter of wire, if the main scale shows 6th division and the vernier reads 46.

- (a) 6.46 mm (b) 3.46 mm
 (c) 6.54 mm (d) 3.04 mm

10. In vernier callipers instrument 20 vernier scale divisions coincide with 18 main scale divisions where 1 mm = 1 main scale division. The least count is
- (a) 0.02 mm (b) 0.05 mm
 (c) 0.1 mm (d) 0.2 mm

11. Dimensions of $\frac{h}{G}$ are:

- (a) $[M^2L^{-1}T^1]$ (b) $[M^{-2}L^1T^{-1}]$
 (c) $[M^{-1}L^{-2}T^{-1}]$ (d) $[M^0L^0T^0]$

12. In Ohm's law experiment, the potential drop across a resistance was measured as $V = 5.0$ volt and the current was measured as $i = 2.00$ A. Find the resistance with the maximum permissible error in resistance

- (a) $(2.5 \pm 2.5\%) \Omega$ (b) $(2.5 \pm 0.25\%) \Omega$
 (c) $(2.5 \pm 0.025\%) \Omega$ (d) None of these

13. If \vec{A} and \vec{B} are two non-zero vectors such that $|\vec{A} + \vec{B}| = \frac{|\vec{A} - \vec{B}|}{2}$ and $|\vec{A}| = 2|\vec{B}|$ then the angle between \vec{A} and \vec{B} is:

- (a) 37° (b) 53°
 (c) $\cos^{-1}(-3/4)$ (d) $\cos^{-1}(-4/3)$

14. A particle is moving with speed 6 m/s along the direction of $\vec{A} = 2\hat{i} + 2\hat{j} - \hat{k}$, then its velocity is:

- (a) $(4\hat{i} + 2\hat{j} - 4\hat{k})$ units (b) $(4\hat{i} + 4\hat{j} - 2\hat{k})$ units
 (c) $(4\hat{i} + 4\hat{j} - 4\hat{k})$ units (d) $(2\hat{i} + 4\hat{j} - 2\hat{k})$ units

RESPONSE GRID

4. (a)(b)(c)(d) 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. Three forces \vec{P} , \vec{Q} and \vec{R} are acting on a particle in the plane. The angle between \vec{P} , \vec{Q} and \vec{R} are 150° and 120° respectively. Then for equilibrium, the magnitudes P , Q and R are in the ratio **E**
- (a) 1 : 2 : 3 (b) 1 : 2 : $\sqrt{3}$
 (c) 3 : 2 : 1 (d) $\sqrt{3}$: 2 : 1
16. The main scale of a vernier calliper has n divisions/cm. n divisions of the vernier scale coincide with $(n - 1)$ divisions of main scale. The least count of the vernier calliper is, **B**
- (a) $\frac{1}{(n + 1)(n - 1)}$ cm (b) $\frac{1}{n}$ cm
 (c) $\frac{1}{n^2}$ cm (d) $\frac{1}{n(n + 1)}$ cm
17. A particle moves so that its position vector is given by $\vec{r} = \cos \omega t \hat{x} + \sin \omega t \hat{y}$. Which of the following is true? **G**
- (a) Velocity and acceleration both are perpendicular to \vec{r} .
 (b) Velocity and acceleration both are parallel to \vec{r} .
 (c) Velocity is perpendicular to \vec{r} and acceleration is directed towards the origin.
 (d) Velocity is perpendicular to \vec{r} and acceleration is directed away from the origin.
18. 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 **B**
- (a) $-\frac{3}{2}, \frac{1}{2}, 1$ (b) $-1, -2, 3$
 (c) $\frac{1}{2}, -\frac{3}{2}, -\frac{1}{2}$ (d) $1, 2, \frac{1}{3}$
19. The mass and volume of a body are found to be 5.00 ± 0.05 kg and 1.00 ± 0.05 m³ respectively. Then the maximum possible percentage error in its density is **E**
- (a) 6% (b) 3%
 (c) 10% (d) 5%
20. If E , m , J and G represent energy, mass, angular momentum and gravitational constant respectively, then the dimensional formula of EJ^2/m^5G^2 is same as that of the **B**
- (a) angle (b) length
 (c) mass (d) time

PART-II (Numeric/Integer Type Questions)

21. A student measures the resistance $R_1 = 10 \pm 1 \Omega$ and $R_2 = 20 \pm 0.5 \Omega$. What is the range of value of resistance obtained when they are connected in parallel? **E**
22. If \vec{a} and \vec{b} are two unit vectors such that $\vec{a} + 2\vec{b}$ and $3\vec{a} - 2\vec{b}$ are perpendicular to each other then the angle between them is **E**
23. Two vectors in the x - y plane of magnitude 3 units each make angle of 60° between them, where one is along x -axis. If the vectors are rotated by 30° each in same direction the x -component of their resultant will be **E**
24. If the sides of a rectangle are 45.1 cm and 2.32 cm, what is the perimeter correct to significant digits? **D**
25. Consider the following data : **E**
 10 main scale division = 1 cm, 10 vernier division = 9 main scale divisions. Zero of vernier scale is to the right of the zero marking of the main scale with 6 vernier divisions coinciding with main scale divisions. The measured reading for length measurement is 4.3 cm on main scale with 2 vernier divisions coinciding with main scale graduations. Estimate the actual length in cm **E**
26. The length of a square plate is given to be 1.5m. The area of the this plate in correct significant digits is :- **E**
27. Two vectors \vec{P} and \vec{Q} are such that $|\vec{P}| = |\vec{Q}|$. If one of the vectors is exactly halved, the angle made by their resultant with the other vector also gets halved. Find angle between \vec{P} and \vec{Q} . **E**

RESPONSE GRID

15. (a) (b) (c) (d)	16. (a) (b) (c) (d)	17. (a) (b) (c) (d)	18. (a) (b) (c) (d)	19. (a) (b) (c) (d)
20. (a) (b) (c) (d)	21. <input type="text"/>	22. <input type="text"/>	23. <input type="text"/>	24. <input type="text"/>
25. <input type="text"/>	26. <input type="text"/>	27. <input type="text"/>		

28. 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 $ML^{-1}T^{-1}$ is **D**
29. 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. Then what is the diameter (in mm) of the wire? **F**
30. 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%, then what is the relative percentage error in the density? **F**

RESPONSE GRID

28. 29. 30.

Remedial Measures							
Typology of Questions	Question Number		Correct Questions		Wrong Questions		Remedial Measures
	CP01L1	CP01L2	CP01L1	CP01L2	CP01L1	CP01L2	
A (Simple Theory based)							Before solving Type A Questions, Revise theory of Complete Chapter.
B (Theory based Questions of Higher Order)	2, 5, 6, 8, 10, 11, 16, 18, 20	5, 6, 7, 8, 9, 10					For Type B, Revise & Practice theory based Questions.
C (Simple Formula based Questions)							For Type C, Revise formulae of complete chapter.
D (Simple Numeric Questions)	3, 4, 9, 24, 28						For Type D, Revise & Practice formulae based Questions.
E (Numerical Questions of Higher Order)	1, 7, 12, 13, 14, 15, 19, 21, 22, 23, 25, 26, 27	1, 2, 3, 4					For Type E, Revise higher order Questions.
F (Numerical Questions of indepth Knowledge)	17						For Type F Questions, Practice Critical thinking Questions.
G (Multi-concept Problems)	29, 30						Revise A to F Type Questions thoroughly.

SYLLABUS : General Physics
(Level 2) Higher Order Questions

CP01L2

Max. Marks : 40

Time : 30 min.

INSTRUCTIONS : This Daily Practice Problem Sheet contains 10 MCQs with only one correct option. Darken the correct circle/ bubble in the Response Grid provided on each page.

Marking Scheme : (+4) for correct & (-1) for incorrect answer and zero for unattempted.

1. The percentage error in measurement of a physical quantity m given by $m = \pi \tan \theta$ is minimum when **E**
- (a) $\theta = 45^\circ$ (b) $\theta = 90^\circ$
 (c) $\theta = 60^\circ$ (d) $\theta = 30^\circ$
2. Force acting on a particle is 5N. If unit of length and time are doubled and unit of mass is halved then numerical value of the force in the new system will be **E**
- (a) 5 (b) 1/20
 (c) 20 (d) 1/5
3. A student measures the time period of 20 oscillation of a simple pendulum five times. That data set is 53 s, 52 s, 55 s, 54 s and 51 s. If the minimum division in the measuring clock is 1 s, then the reported time should be **E**
- (a) 50 ± 1 sec (b) 52 ± 2 sec
 (c) 53 ± 2 sec (d) 53 ± 1 sec
4. The value of one division of a vernier scale in a device is $(0.4)^\circ$ and 20 divisions of main scale are equal to 25 divisions of vernier. Then least count of device is : **E**
- (a) $(0.5)^\circ$ (b) $(0.4)^\circ$
 (c) $(0.2)^\circ$ (d) $(0.1)^\circ$
5. 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] **B**
- (a) $\frac{1}{c^2} \left[G \frac{e^2}{4\pi\epsilon_0} \right]^{\frac{1}{2}}$ (b) $c^2 \left[G \frac{e^2}{4\pi\epsilon_0} \right]^{\frac{1}{2}}$
 (c) $\frac{1}{c^2} \left[\frac{e^2}{G4\pi\epsilon_0} \right]^{\frac{1}{2}}$ (d) $\frac{1}{c} G \frac{e^2}{4\pi\epsilon_0}$
6. 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? **B**
- (a) $\frac{\sqrt{hG}}{c^2}$ (b) $\frac{\sqrt{hG}}{c^2}$
 (c) $\sqrt{\frac{hc}{G}}$ (d) $\sqrt{\frac{Gc}{h^2}}$
7. If the capacitance of a nanocapacitor is measured in terms of a unit ' u ' made by combining the electric charge ' e ', Bohr radius ' a_0 ', Planck's constant ' h ' and speed of light ' c ' then **B**
- (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) $u = \frac{e^2 a_0}{hc}$

**RESPONSE
GRID**

1. (a)(b)(c)(d) 2. (a)(b)(c)(d) 3. (a)(b)(c)(d) 4. (a)(b)(c)(d) 5. (a)(b)(c)(d)
 6. (a)(b)(c)(d) 7. (a)(b)(c)(d)

8. If Q denote the charge on the plate of a capacitor of capacitance C then the dimensional formula for $\frac{Q^2}{C}$ is **B**
- (a) $[L^2M^2T]$ (b) $[LMT^2]$
 (c) $[L^2MT^{-2}]$ (d) $[L^2M^2T^2]$
9. The dimensions of mobility are
- (a) $M^{-2}T^2A$ (b) $M^{-1}T^2A$
 (c) $M^{-2}T^3A$ (d) $M^{-1}T^3A$
10. A student measured the length of a rod as 3.50 cm. Which instrument did he use to measure it? **B**
- (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

RESPONSE GRID

8. (a)(b)(c)(d) 9. (a)(b)(c)(d) 10. (a)(b)(c)(d)

SCORE CALCULATOR

Daily Practice Problem DPP Chapterwise CP01L1 & CP01L2

DPP		Questions	Maximum Score	Attempted	Correct	Incorrect	Net Score	Qualifying	Cut-off
CP01L1	Part I	20	80					50	35
	Part II	10	40					24	15
CP01L2		10	40					20	12

Success Gap = Net Score – Qualifying Score

Net Score = $[(\text{Correct} \times 4) - (\text{Incorrect} \times 1)]$ for Part I & L2 + $[(\text{correct} \times 4)]$ for Part II

* If your score is $< 75\%$ go back to the chapter and read it thoroughly.