

QUICK DRILL · CBSE CLASS 11

Units and Measurements

Physics · Chapter 1 · 15 MCQs · 20 minutes · PYQ-tagged with time budgets

DATE	TOTAL MARKS 15	DURATION 20 min	MARKING +1 / 0	TARGET ≥ 12/15
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OBJECTIVES

Reinforce the four core topics of Units and Measurements via 15 PYQ-derived MCQs. Identify weak sub-topics via concept-node IDs (see answer key). Build per-question time budget habit.

INSTRUCTIONS

Attempt all 15. Time budget shown per Q (use it as pacing guide). Mark answers (A/B/C/D) in the margin. Answer key + explanations on the last page. **Don't peek — score yourself honestly.**

SECTION · QUICK DRILL

Q 1-15 · 20 MIN

Q1. Which of the following is NOT one of the seven SI base units?

- (A) kelvin (B) mole
(C) newton (D) candela

PYQ 2022 · CBSE SQP · 1m · 30s

Q2. The number of significant figures in 0.00208 is:

- (A) 5 (B) 3
(C) 2 (D) 6

PYQ 2021 · School Annual · 1m · 30s

Q3. If $Z = A^2B/C^3$ and the percentage errors in A, B, C are 1%, 2% and 3%, the maximum percentage error in Z is:

- (A) 6% (B) 9%
(C) 13% (D) 11%

PYQ 2022 · CBSE SQP · 1m · 60s

Q4. The dimensional formula of force is:

- (A) $[M L T^{-1}]$ (B) $[M L T^{-2}]$
(C) $[M L^2 T^{-2}]$ (D) $[M L^{-1} T^{-2}]$

PYQ 2020 · School Annual · 1m · 30s

Q5. A clock that always runs exactly 5 minutes fast is best described as:

- (A) Accurate but not precise (B) Precise but not accurate
(C) Both accurate and precise (D) Neither

PYQ 2021 · CBSE SQP · 1m · 30s

Q6. Which of these errors can be reduced by taking the mean of many readings?

- (A) Zero error of an instrument (B) Random error
(C) A wrongly calibrated scale (D) Personal bias in reading a meniscus

PYQ 2020 · CBSE SQP · 1m · 30s

Q7. The dimensional formula of the gravitational constant G is:

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

PYQ 2022 · School Annual · 1m · 60s

Q8. For $Z = A + B$ with $A = 4.0 \pm 0.1$ and $B = 2.0 \pm 0.2$, the result is:

- (A) 6.0 ± 0.1 (B) 6.0 ± 0.3
(C) 6.0 ± 0.2 (D) 6.0 ± 0.05

PYQ 2021 · School Annual · 1m · 30s

Q9. Why can dimensional analysis NOT verify the equation $s = ut + \frac{1}{2}at^2$?

- (A) It has too few terms (B) It contains a trigonometric function
(C) It is a sum of terms and contains the dimensionless constant $\frac{1}{2}$ (D) All quantities are dimensionless

PYQ 2022 · CBSE SQP · 1m · 45s

Q10. Rounded to the correct number of significant figures, 4.327×2.1 equals:

- (A) 9.0867 (B) 9.09
(C) 9.1 (D) 9

Q11. The parallax method is primarily used to measure:
(A) The mass of the Sun **(B)** Very large (astronomical) distances
(C) The diameter of a molecule **(D)** Atomic time intervals
 PYQ 2020 · School Annual · 1m · 30s

Q12. Which quantity is dimensionless?
(A) Momentum **(B)** Strain
(C) Pressure **(D)** Power
 PYQ 2022 · School Annual · 1m · 30s

Q13. If $Z = A/B$ with $A = 100 \pm 2$ and $B = 50 \pm 1$, the maximum percentage error in Z is:
(A) 1% **(B)** 2%
(C) 4% **(D)** 3%
 PYQ 2021 · School Annual · 1m · 45s

Q14. The number of significant figures in 6.320×10^3 is:
(A) 3 **(B)** 4
(C) 5 **(D)** 7
 PYQ 2020 · CBSE SQP · 1m · 30s

Q15. By dimensional analysis, the period of a simple pendulum depends on length l and g as $T \propto$:
(A) $l \cdot g$ **(B)** $\sqrt{l/g}$
(C) $\sqrt{g/l}$ **(D)** l/g
 PYQ 2022 · CBSE SQP · 1m · 60s

ANSWER KEY & EXPLANATIONS

Q 1-15 · MARK YOUR SCORE

Q1. Answer: C

The newton is a DERIVED unit (kg m s^{-2} , from $F = ma$). Kelvin, mole and candela are base units.

Q2. Answer: B

Leading zeros are not significant; the significant digits are 2, 0, 8 → 3 significant figures.

Q3. Answer: C

%error = $2(1) + 1(2) + 3(3) = 2 + 2 + 9 = 13\%$. Exponents multiply the relative errors; all add.

Q4. Answer: B

Force = mass × acceleration = $[M][L T^{-2}] = [M L T^{-2}]$.

Q5. Answer: B

It gives the same reading every time (precise) but never the true time (inaccurate) — a systematic error.

Q6. Answer: B

Random errors scatter symmetrically and average out. The other three are systematic and must be CORRECTED.

Q7. Answer: A

From $F = GMm/r^2$, $G = Fr^2/(Mm) = [M L T^{-2}][L^2]/[M^2] = [M^{-1} L^3 T^{-2}]$.

Q8. Answer: B

For a sum, ABSOLUTE errors add: $\Delta Z = 0.1 + 0.2 = 0.3$. So $Z = 6.0 \pm 0.3$.

Q9. Answer: C

Dimensional analysis cannot fix the pure number $\frac{1}{2}$ and cannot DERIVE a multi-term (sum) relation — though it can CHECK that each term is L.

Q10. Answer: C

2.1 has 2 s.f. (the fewest), so the product keeps 2 s.f.: $9.0867 \rightarrow 9.1$.

Q11. Answer: B

Parallax uses a known baseline and the small subtended angle to find large distances: $D = b/\theta$.

Q12. Answer: B

Strain = change in length / original length = $[L]/[L] = M^0L^0T^0$, dimensionless. The others have dimensions.

Q13. Answer: C

For a quotient, relative errors add: $(2/100) + (1/50) = 0.02 + 0.02 = 0.04 = 4\%$.

Q14. Answer: B

In scientific notation only the mantissa counts: 6.320 has a trailing zero AFTER the decimal, so 4 significant figures.

Q15. Answer: B

Assuming $T \propto l^a g^b$ and equating M, L, T powers gives $a = \frac{1}{2}$, $b = -\frac{1}{2} \rightarrow T \propto \sqrt{l/g}$. The 2π is supplied externally.