

Class 9 – Easy Notes - Physics

CHAPTER 1 – PHYSICAL QUANTITIES & MEASUREMENTS

Solved Exercise

مندرجہ ذیل سوالات کو ایسے انداز میں حل کیا گیا ہے کہ وہ ذہین، اوسط اور نسبتاً کمزور طلبہ کے لیے یکساں طور پر فائدہ مند ہوں۔ یہ جوابات بورڈ امتحان کی توقعات کو مد نظر رکھتے ہوئے تیار کیے گئے ہیں، تاکہ طلبہ انہیں یاد کر کے امتحان میں مکمل نمبر حاصل کر سکیں۔۔

Constructed Response Questions

1.1 In what unit will you express each of the following?

- Thickness of a five-rupee coin: millimeter
- Length of a book: centimeter
- Length of a football field: meter
- The distance between two cities: kilometer
- Mass of five-rupee coin: gram
- Mass of your school bag: kilogram
- Duration of your class period: minute
- Volume of petrol filled in the tank of a car: liter
- Time to boil one litre milk: minute

1.2 Why might a standard system of measurement be helpful to a tailor?

For toppers to average students:

A standard system of measurement helps a tailor take precise and consistent body measurements, ensuring the clothes fit perfectly and avoid mistakes.

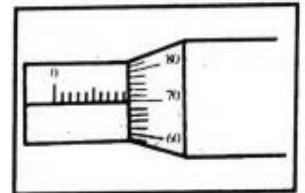
For weak students:

It helps the tailor take accurate measurements using standard units and make clothes that fit properly.

1.3 The minimum main scale reading of a micrometer screw gauge is 1mm and there are 100 divisions on the circular scale. When thimble is rotated once, 1mm is its measurement on the main scale. What is the least count of the instrument? The reading for thickness of a steel rod as shown in the figure. What is the thickness of the rod?

$$\text{Least Count} = \frac{\text{value of 1 main scale division}}{\text{total divisions on vernier scale}} = \frac{1 \text{ mm}}{100} = 0.01 \text{ mm} = 0.001 \text{ cm}$$

$$\text{total thickness} = \text{MSR} + (\text{CSR} \times \text{LC}) = 9 + (70 \times 0.01) = 9.70 \text{ mm}$$



1.4 You are provided a meter scale and a bundle of pencils; how can the diameter of the pencil be measured using the meter scale with the same precision as that of Vernier Callipers? Describe briefly.

For toppers to average students:

Arrange 10 identical pencils side by side without gaps and measure the total width using a meter scale. Then divide the total width by 10 to get the diameter of one pencil. This method reduces error and increases accuracy, making the result close to Vernier Calliper precision.

For weak students:

Put 10 pencils together and measure their total width. Divide the total by 10 to find the diameter of one pencil. This method gives result close to Vernier Calliper precision.

1.5 The end of a meter scale is worn out. Where will you place a pencil to find the length?For toppers to average students:

Place the pencil starting from the 1 cm mark (or any clear mark) instead of the worn-out zero end. Then subtract the initial reading from the final reading to find the correct length.

For weak students:

Start measuring from 1 cm or any other clear point. After that, minus the starting number from the ending number to get the length.

1.6 Why is it better to place the object close to the meter scale?For all students:

Placing the object close to the meter scale reduces parallax error, which improves the accuracy and reliability of the measurement.

1.7 Why a standard unit is needed to measure a quantity correctly?For toppers to average students:

A standard unit ensures that measurements are accurate, uniform, and understood universally, so that everyone gets the same value for the same quantity.

For weak students:

Because it helps all people measure the same way and get the same answer.

1.8 Suggest some natural phenomenon that could serve as a reasonably accurate time standardFor all students:

- a) Rotation of the Earth (1 day)
- b) Revolution of the Earth around the Sun (1 year)
- c) Oscillations of a pendulum
- d) Vibrations of atoms in atomic clocks

1.9 It is difficult to locate the meniscus in a wider vessel. Why?For all students:

Because in a wide vessel, the meniscus of the liquid spreads out and looks flat. That makes it hard to see the lowest point for correct reading.

1.10 Which instrument can be used to measure: (i) internal diameter of the test tube (ii) depth of a beaker

For all students:

Both can be measured using a Vernier Callipers.

- (i) Internal diameter of the test tube: The upper jaws of the Vernier Callipers are used.
- (ii) Depth of a beaker: The depth rod of the Vernier Callipers is used