

9th Class Physics — Unit 1: Physical Quantities and Measurement

40 Most Important MCQs with Answers and Step-by-Step Solutions

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Based on the uploaded Federal Board Grade 9 Physics Model Textbook, Unit 1.

Answer Key

1. A	2. B	3. B	4. D	5. C	6. B	7. B	8. A
9. C	10. B	11. B	12. B	13. D	14. C	15. C	16. B
17. B	18. B	19. C	20. B	21. C	22. A	23. C	24. B
25. A	26. B	27. B	28. A	29. A	30. B	31. C	32. C
33. B	34. C	35. B	36. B	37. A	38. B	39. B	40. A

40 Most Important MCQs with Solutions

1. A physical quantity is a quantity that can be
- A) measured and expressed by a number and unit
 - B) seen only
 - C) estimated without a unit
 - D) described only in words

Correct Answer: A) measured and expressed by a number and unit

Solution: A physical quantity is measurable and is expressed by a numerical value together with an appropriate unit.

2. Which is an SI base quantity?

- A) Force
- B) Length
- C) Area
- D) Density

Correct Answer: B) Length

Solution: Length is one of the seven SI base quantities. Force, area and density are derived quantities.

3. The SI base unit of luminous intensity is

- A) lux
- B) candela
- C) lumen
- D) watt

Correct Answer: B) candela

Solution: The SI base unit of luminous intensity is candela (cd).

4. Which is a derived physical quantity?

- A) Mass
- B) Time
- C) Length
- D) Volume

Correct Answer: D) Volume

Solution: Volume is a derived quantity because it is obtained from length: $V = l \times w \times h$, so its SI unit is m^3 .

5. The SI unit of force is

- A) $kg\ m\ s^{-1}$
- B) $kg\ m^2\ s^{-2}$
- C) $kg\ m\ s^{-2}$
- D) $kg\ s^{-2}$

Correct Answer: C) $kg\ m\ s^{-2}$

Solution: From $F = ma$, force has SI unit $kg \times m/s^2 = kg\ m\ s^{-2}$, called the newton (N).

6. The prefix kilo represents

- A) 10^2
- B) 10^3
- C) 10^{-3}
- D) 10^6

Correct Answer: B) 10^3

Solution: The prefix kilo means 10^3 . Thus $1\ km = 10^3\ m$.

7. The prefix micro (μ) represents

- A) 10^{-3}
- B) 10^{-6}
- C) 10^{-9}
- D) 10^6

Correct Answer: B) 10^{-6}

Solution: The prefix micro (μ) means 10^{-6} . Thus $1\ \mu m = 10^{-6}\ m$.

8. The prefix nano (n) represents

- A) 10^{-9}
- B) 10^{-6}
- C) 10^9
- D) 10^3

Correct Answer: A) 10^{-9}

Solution: The prefix nano (n) means 10^{-9} . Thus $1 \text{ nm} = 10^{-9} \text{ m}$.

9. 0.00000025 m in standard form is

- A) $2.5 \times 10^{-5} \text{ m}$
- B) $2.5 \times 10^{-6} \text{ m}$
- C) $2.5 \times 10^{-7} \text{ m}$
- D) $25 \times 10^{-7} \text{ m}$

Correct Answer: C) $2.5 \times 10^{-7} \text{ m}$

Solution: Move the decimal point 7 places to the right to obtain a coefficient between 1 and 10: $0.00000025 = 2.5 \times 10^{-7}$.

10. 7.2×10^5 is equal to

- A) 72,000
- B) 720,000
- C) 7,200,000
- D) 720

Correct Answer: B) 720,000

Solution: $7.2 \times 10^5 = 7.2 \times 100,000 = 720,000$.

11. The number of significant figures in 0.00580 is

- A) 2
- B) 3
- C) 4
- D) 5

Correct Answer: B) 3

Solution: Leading zeros are not significant. The digits 5, 8 and the trailing zero after the decimal are significant, so 0.00580 has 3 significant figures.

12. A quantity having magnitude only is called a

- A) vector
- B) scalar
- C) unit
- D) dimension

Correct Answer: B) scalar

Solution: A scalar quantity has magnitude only; it does not require a direction.

13. Which is a vector quantity?

- A) Mass
- B) Time
- C) Speed
- D) Displacement

Correct Answer: D) Displacement

Solution: Displacement has both magnitude and direction, so it is a vector quantity.

14. Which is a scalar quantity?

- A) Velocity
- B) Force
- C) Speed
- D) Displacement

Correct Answer: C) Speed

Solution: Speed has magnitude only, so it is a scalar quantity.

15. A vector is completely specified by its

- A) magnitude only
- B) direction only
- C) magnitude and direction
- D) unit only

Correct Answer: C) magnitude and direction

Solution: A vector is completely described by both its magnitude and its direction.

16. The graphical method commonly used to add two vectors is the

- A) circle method
- B) parallelogram method
- C) ratio method
- D) calibration method

Correct Answer: B) parallelogram method

Solution: The chapter presents the parallelogram method as a graphical method for finding the resultant of two vectors.

17. Two perpendicular vectors have magnitudes 3 N and 4 N. Their resultant magnitude is

- A) 1 N
- B) 5 N
- C) 7 N
- D) 12 N

Correct Answer: B) 5 N

Solution: For perpendicular vectors, $R = \sqrt{3^2 + 4^2} = \sqrt{25} = 5 \text{ N}$.

18. The smallest division on a standard metre rule is generally

- A) 1 cm
- B) 1 mm
- C) 0.1 mm
- D) 10 mm

Correct Answer: B) 1 mm

Solution: A standard metre rule is divided into millimetres; its smallest division is 1 mm.

19. The least count of a metre rule with 1 mm smallest division is

- A) 1 cm
- B) 0.1 cm
- C) 0.01 cm
- D) 0.001 cm

Correct Answer: C) 0.01 cm

Solution: $1 \text{ mm} = 0.1 \text{ cm}$, so a 1 mm smallest division corresponds to a least count of 0.1 mm.

20. A vernier caliper is particularly useful for measuring

- A) temperature only
- B) small lengths, internal/external dimensions and depth
- C) time only
- D) mass only

Correct Answer: B) small lengths, internal/external dimensions and depth

Solution: A vernier caliper can measure small lengths and is used for internal/external dimensions and depth.

21. According to the chapter, a common least count of a vernier caliper is

- A) 1 cm
- B) 1 mm
- C) 0.1 mm
- D) 10 mm

Correct Answer: C) 0.1 mm

Solution: The chapter gives 0.1 mm as a common least count for a vernier caliper in its measurement discussion.

22. A screw gauge is used to measure

- A) very small thicknesses/diameters
- B) large distances
- C) time intervals
- D) temperature

Correct Answer: A) very small thicknesses/diameters

Solution: A screw gauge is designed for very small measurements such as the thickness or diameter of small objects.

23. The least count of the screw gauge shown in the chapter is

- A) 1 mm
- B) 0.1 mm
- C) 0.01 mm
- D) 1 cm

Correct Answer: C) 0.01 mm

Solution: The chapter gives the screw gauge least count as 0.01 mm in its worked discussion.

24. A zero error occurs when

- A) an instrument reads zero for a zero quantity
- B) an instrument does not read zero when it should
- C) a quantity is a vector
- D) a measurement is repeated

Correct Answer: B) an instrument does not read zero when it should

Solution: If an instrument does not read zero when the measured quantity is actually zero, it has zero error.

25. An error caused by a faulty or incorrectly calibrated instrument is generally

- A) systematic error
- B) random error
- C) rounding error only
- D) parallax-free error

Correct Answer: A) systematic error

Solution: A faulty instrument, calibration problem or another consistent instrumental effect can produce a systematic error.

26. Errors that vary unpredictably from one measurement to another are

- A) systematic errors
- B) random errors
- C) unit errors
- D) vector errors

Correct Answer: B) random errors

Solution: Random errors vary unpredictably from one measurement to another and can often be reduced by repeated measurements and averaging.

27. Accuracy refers to

- A) closeness of repeated readings to one another
- B) closeness of a measurement to the true value
- C) number of instruments used
- D) size of the unit

Correct Answer: B) closeness of a measurement to the true value

Solution: Accuracy describes how close a measurement is to the true/accepted value.

28. Precision refers to

- A) closeness of repeated measurements to one another
- B) closeness to the SI unit
- C) magnitude of a vector
- D) size of an object

Correct Answer: A) closeness of repeated measurements to one another

Solution: Precision describes how close repeated measurements are to one another.

29. Which instrument is used to measure mass in the chapter?

- A) Physical balance
- B) Stopwatch
- C) Vernier caliper
- D) Measuring cylinder

Correct Answer: A) Physical balance

Solution: A physical balance is used to measure mass.

30. A measuring cylinder is primarily used to measure

- A) mass
- B) volume of liquids
- C) time
- D) force

Correct Answer: B) volume of liquids

Solution: A measuring cylinder is used to measure the volume of liquids.

31. A stopwatch is used to measure

- A) length
- B) mass
- C) time interval
- D) volume

Correct Answer: C) time interval

Solution: A stopwatch measures a time interval.

32. 1 nanometre is equal to

- A) 10^{-3} m
- B) 10^{-6} m
- C) 10^{-9} m
- D) 10^9 m

Correct Answer: C) 10^{-9} m

Solution: The nano prefix is 10^{-9} , so $1 \text{ nm} = 10^{-9} \text{ m}$.

33. 1 micrometre is equal to

- A) 10^{-9} m
- B) 10^{-6} m
- C) 10^{-3} m
- D) 10^6 m

Correct Answer: B) 10^{-6} m

Solution: The micro prefix is 10^{-6} , so $1 \mu\text{m} = 10^{-6} \text{ m}$.

34. 1 millimetre is equal to

- A) 10^{-1} m
- B) 10^{-2} m
- C) 10^{-3} m
- D) 10^{-6} m

Correct Answer: C) 10^{-3} m

Solution: The milli prefix is 10^{-3} , so $1 \text{ mm} = 10^{-3} \text{ m}$.

35. A force of 6 N to the east and 8 N to the north has resultant magnitude

- A) 2 N
- B) 10 N
- C) 14 N
- D) 48 N

Correct Answer: B) 10 N

Solution: The two components are perpendicular, so $R = \sqrt{(6^2 + 8^2)} = \sqrt{100} = 10 \text{ N}$.

36. Which statement about a scalar is correct?

- A) It must have a direction
- B) It has magnitude but no direction
- C) It is always dimensionless
- D) It cannot be measured

Correct Answer: B) It has magnitude but no direction

Solution: A scalar is described completely by its magnitude; direction is not required.

37. Which statement about a vector is correct?

- A) It can be represented by a directed line segment
- B) It has no magnitude
- C) It is always a unit
- D) It cannot be added

Correct Answer: A) It can be represented by a directed line segment

Solution: A vector can be represented graphically by a directed line segment, with length representing magnitude and the arrow indicating direction.

38. The purpose of using scientific notation is mainly to

- A) avoid units
- B) express very large or small numbers conveniently
- C) remove significant figures
- D) turn vectors into scalars

Correct Answer: B) express very large or small numbers conveniently

Solution: Scientific notation makes very large and very small numbers compact and convenient, especially when powers of ten are involved.

39. If a measured quantity is written as 4.50 cm, the number of significant figures is

- A) 2
- B) 3
- C) 4
- D) 5

Correct Answer: B) 3

Solution: In 4.50, all three digits 4, 5 and the final zero are significant because the zero is written after the decimal as part of the measured precision.

40. Which pair contains only SI base units?

- A) metre, second, kilogram
- B) newton, joule, metre
- C) pascal, metre, second
- D) watt, kilogram, joule

Correct Answer: A) metre, second, kilogram

Solution: Metre (m), second (s) and kilogram (kg) are SI base units. Newton, joule, pascal and watt are derived units.