

Physics 9th - Chapter 1

Physical Quantities and Measurements | 61 High-Quality Original MCQs

Format: Difficulty, Options, Correct Answer, Explanation, Source Page. These MCQs are created as concept-based practice and are different from textbook exercise MCQs.

Q1. Which statement best defines a physical quantity?

Difficulty: Easy

- A) A quantity that can be guessed without units
- B) A quantity that can be measured and expressed with a unit
- C) A quantity that depends only on feelings
- D) A quantity that has no numerical value

Correct Answer: Option B

Explanation: A physical quantity must be measurable and must be written with a numerical value and a standard unit.

Source Page: 6

Q2. Which option gives the two essential parts of a measurement?

Difficulty: Easy

- A) Number and unit
- B) Instrument and observer
- C) Length and time
- D) Prefix and symbol

Correct Answer: Option A

Explanation: A measurement is meaningful only when it contains both a numerical value and a unit.

Source Page: 8

Q3. Why is a measurement without a unit considered meaningless?

Difficulty: Medium

- A) Because it becomes too large
- B) Because it cannot be compared with a standard
- C) Because it always becomes zero
- D) Because it cannot be written in scientific notation

Correct Answer: Option B

Explanation: The unit tells which standard has been used, so without a unit the numerical value cannot be clearly understood or compared.

Source Page: 8

Q4. Which of the following pairs contains only physical quantities?

Difficulty: Easy

- A) Love and wisdom
- B) Fear and beauty
- C) Length and temperature
- D) Affection and honesty

Correct Answer: Option C

Explanation: Length and temperature can be measured using instruments and expressed with units, so both are physical quantities.

Source Page: 6

Q5. Which feature separates a non-physical quantity from a physical quantity?

Difficulty: Medium

- A) It has a base unit
- B) It can be measured directly
- C) It depends on observation or interpretation
- D) It is always derived from length

Correct Answer: Option C

Explanation: Non-physical quantities such as love or fear are qualitative and depend on interpretation rather than instrument-based measurement.

Source Page: 6-7

Q6. A standard unit is needed mainly to:

Difficulty: Easy

- A) Make every measurement longer
- B) Avoid confusion caused by different personal standards
- C) Remove numerical values from measurements
- D) Convert all units into prefixes

Correct Answer: Option B

Explanation: Different people may have different hand spans, steps or arms, so standard units are needed to make measurements uniform.

Source Page: 8

Q7. Which example shows why old personal units were unreliable?

Difficulty: Medium

- A) Different people may have different foot lengths
- B) All rulers have the same scale
- C) SI units are based on seven units
- D) Scientific notation uses powers of ten

Correct Answer: Option A

Explanation: Measurements based on hands, feet or steps vary from person to person, which creates confusion.

Source Page: 8

Q8. Which of the following is an SI base quantity?

Difficulty: Easy

- A) Pressure
- B) Area
- C) Temperature
- D) Speed

Correct Answer: Option C

Explanation: Temperature is one of the seven SI base quantities, while pressure, area and speed are derived quantities.

Source Page: 8-9

Q9. Which SI base unit is paired correctly with its physical quantity?

Difficulty: Easy

- A) Mass - metre
- B) Time - second
- C) Length - kilogram
- D) Temperature - ampere

Correct Answer: Option B

Explanation: The SI base unit of time is the second, represented by the symbol s.

Source Page: 8

Q10. Which physical quantity has candela as its SI base unit?

Difficulty: Medium

- A) Electric current
- B) Amount of substance
- C) Intensity of light
- D) Temperature

Correct Answer: Option C

Explanation: Candela is the SI base unit used for intensity of light.

Source Page: 8

Q11. Which SI base unit is used for amount of substance?

Difficulty: Easy

- A) Mole
- B) Kelvin
- C) Candela
- D) Ampere

Correct Answer: Option A

Explanation: The amount of substance is measured in mole, whose symbol is mol.

Source Page: 8

Q12. Which option contains only SI base units?

Difficulty: Medium

- A) Metre, kilogram, second
- B) Newton, pascal, coulomb
- C) Square metre, cubic metre, metre per second
- D) Joule, watt, volt

Correct Answer: Option A

Explanation: Metre, kilogram and second are base units, while the other options include derived units.

Source Page: 8-9

Q13. A derived quantity is one that:

Difficulty: Easy

- A) Cannot be measured
- B) Is formed from one or more base quantities
- C) Has no unit
- D) Is always non-physical

Correct Answer: Option B

Explanation: Derived quantities are defined in terms of base quantities, for example speed depends on distance and time.

Source Page: 7-9

Q14. Which of the following is a derived unit?

Difficulty: Easy

- A) Kilogram
- B) Second
- C) Kelvin
- D) Newton

Correct Answer: Option D

Explanation: Newton is a derived unit used for force, while kilogram, second and kelvin are SI base units.

Source Page: 9

Q15. The unit of area is derived by multiplying:

Difficulty: Easy

- A) Mass by time
- B) Length by breadth
- C) Temperature by time
- D) Current by resistance

Correct Answer: Option B

Explanation: Area is obtained by length x breadth, so its unit becomes metre x metre or square metre.

Source Page: 9

Q16. Which expression represents the SI unit of speed?

Difficulty: Medium

- A) m s
- B) m s^{-1}
- C) kg m^{-3}
- D) N m^{-2}

Correct Answer: Option B

Explanation: Speed is distance divided by time, so its SI unit is metre per second, written as m s^{-1} .

Source Page: 9

Q17. Which derived quantity is expressed in pascal?

Difficulty: Easy

- A) Force
- B) Pressure
- C) Electric charge
- D) Plane angle

Correct Answer: Option B

Explanation: Pascal is the derived SI unit used for pressure.

Source Page: 9

Q18. The unit coulomb can be expressed in terms of base units as:

Difficulty: Hard

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

Correct Answer: Option A

Explanation: Electric charge is related to electric current and time, so coulomb is expressed as ampere second.

Source Page: 9

Q19. Which SI prefix represents 10^3 ?

Difficulty: Easy

- A) Milli
- B) Centi
- C) Kilo
- D) Mega

Correct Answer: Option C

Explanation: Kilo represents 10^3 , meaning one thousand times the base unit.

Source Page: 9-10

Q20. Which prefix should be used for 10^{-6} ?

Difficulty: Medium

- A) Micro
- B) Milli

C) Nano

D) Pico

Correct Answer: Option A

Explanation: Micro has the symbol μ and represents 10^{-6} .

Source Page: 10

Q21. Which prefix has the symbol n?

Difficulty: Easy

A) Nano

B) Micro

C) Milli

D) Mega

Correct Answer: Option A

Explanation: The symbol n represents the SI prefix nano, which means 10^{-9} .

Source Page: 10

Q22. Why are prefixes used with SI units?

Difficulty: Easy

A) To remove the need for units

B) To write very large and very small measurements conveniently

C) To convert all quantities into base quantities

D) To change physical quantities into non-physical quantities

Correct Answer: Option B

Explanation: Prefixes allow large and small values to be written in a shorter and more convenient form.

Source Page: 9

Q23. Which conversion is correct?

Difficulty: Medium

A) 1 km = 100 m

B) 1 cm = 100 mm

C) 1 mm = 10^{-3} m

D) 1 m = 10 cm

Correct Answer: Option C

Explanation: One millimetre is one thousandth of a metre, so 1 mm = 10^{-3} m.

Source Page: 10

Q24. Which value is equal to 2 ms?

Difficulty: Medium

A) 2×10^{-3} s

B) 2×10^3 s

C) 2×10^{-6} s

D) 2×10^6 s

Correct Answer: Option A

Explanation: Milli means 10^{-3} , so 2 milliseconds equals 2×10^{-3} seconds.

Source Page: 10

Q25. In scientific notation, the numerical part is usually written as:

Difficulty: Easy

A) A number from 0 to 1

B) A number from 1 to 9 multiplied by a power of 10

C) Only a whole number greater than 10

D) A number without any exponent

Correct Answer: Option B

Explanation: Scientific notation writes numbers as a value from 1 to 9 multiplied by a suitable power of 10.

Source Page: 10

Q26. Which number is correctly written in scientific notation?

Difficulty: Medium

- A) 52.0×10^3
- B) 0.52×10^5
- C) 5.20×10^4
- D) 520×10^2

Correct Answer: Option C

Explanation: In proper scientific notation, only one non-zero digit is written before the decimal point.

Source Page: 10

Q27. When a decimal point is moved to the left in scientific notation, the exponent of 10 is:

Difficulty: Medium

- A) Positive
- B) Negative
- C) Zero only
- D) Always 1

Correct Answer: Option A

Explanation: Moving the decimal point to the left means the original number is large, so the exponent is positive.

Source Page: 10

Q28. When a decimal point is moved to the right for a very small number, the exponent of 10 becomes:

Difficulty: Medium

- A) Positive
- B) Negative
- C) Zero
- D) Undefined

Correct Answer: Option B

Explanation: For very small numbers, the decimal point is moved to the right and the exponent is written as negative.

Source Page: 10

Q29. Which rule should be followed when adding numbers in scientific notation?

Difficulty: Hard

- A) The units must be ignored
- B) The exponents should be made the same first
- C) Only coefficients are added without checking powers
- D) The decimal point must always move right

Correct Answer: Option B

Explanation: Addition or subtraction in scientific notation is done after making the powers of 10 the same.

Source Page: 11

Q30. The least count of a measuring instrument means:

Difficulty: Easy

- A) The largest value on its scale
- B) The smallest measurement it can accurately record
- C) The average of repeated readings
- D) The mass of the instrument

Correct Answer: Option B

Explanation: Least count is the smallest measurement that can be taken accurately with an instrument.

Source Page: 12

Q31. The least count of a metre rule is usually:

Difficulty: Easy

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

Correct Answer: Option B

Explanation: A metre rule is commonly divided into millimetres, so its least count is 1 mm.

Source Page: 11-12

Q32. Which practice helps reduce parallax error while using a metre rule?

Difficulty: Medium

- A) Reading from the left side only
- B) Keeping the eye directly above the mark
- C) Using only a measuring tape
- D) Avoiding the zero mark always

Correct Answer: Option B

Explanation: Parallax error is reduced by keeping the eye perpendicular to the scale at the point of reading.

Source Page: 12

Q33. Why should the zero mark of a metre rule coincide with one edge of the object?

Difficulty: Medium

- A) To increase the object length
- B) To avoid incorrect starting reading
- C) To convert cm into mm
- D) To reduce the weight of the ruler

Correct Answer: Option B

Explanation: The reading is taken from the zero mark to the other edge, so the zero mark must be properly aligned with one edge of the object.

Source Page: 12

Q34. Vernier calipers are mainly used to measure:

Difficulty: Easy

- A) Only very long distances
- B) Small lengths up to one tenth of a millimetre
- C) Mass of heavy objects
- D) Time intervals

Correct Answer: Option B

Explanation: Vernier calipers can measure small dimensions accurately up to 0.1 mm.

Source Page: 12

Q35. The least count of the Vernier calipers described in the chapter is:

Difficulty: Easy

- A) 1 mm
- B) 0.5 mm
- C) 0.1 mm
- D) 0.01 mm

Correct Answer: Option C

Explanation: The Vernier calipers have a least count of 0.1 mm according to the given scale relation.

Source Page: 12-13

Q36. Which part of Vernier calipers is used to measure internal dimensions?

Difficulty: Medium

- A) Outside jaws
- B) Inside jaws
- C) Tail only
- D) Main scale only

Correct Answer: Option B

Explanation: The inside jaws of Vernier calipers are used for measuring internal dimensions of an object.

Source Page: 13

Q37. Which part of Vernier calipers is used to measure depth?

Difficulty: Medium

- A) Anvil
- B) Ratchet
- C) Tail or depth gauge
- D) Circular scale

Correct Answer: Option C

Explanation: The tail or depth gauge of Vernier calipers is used to measure the depth of an object.

Source Page: 13

Q38. If the zero of the Vernier scale is to the right of the zero of the main scale, the instrument shows:

Difficulty: Hard

- A) Less than the actual length
- B) More than the actual length
- C) No measurement
- D) Only random error

Correct Answer: Option B

Explanation: When the Vernier zero is on the right side, the instrument reads slightly more than the actual value and the zero error is subtracted.

Source Page: 14

Q39. If the zero of the Vernier scale is to the left of the zero of the main scale, the correction is made by:

Difficulty: Hard

- A) Subtracting the zero error
- B) Adding the zero error
- C) Ignoring the reading
- D) Changing the unit to metre

Correct Answer: Option B

Explanation: When the Vernier zero is on the left side, the instrument reads less than the actual value, so the zero error is added.

Source Page: 14

Q40. A micrometer screw gauge is more suitable than Vernier calipers for measuring:

Difficulty: Easy

- A) Distance between two cities
- B) Diameter of a thin wire
- C) Duration of a class period

D) Volume of a liquid

Correct Answer: Option B

Explanation: A micrometer screw gauge has a smaller least count and is suitable for very small lengths such as wire diameter.

Source Page: 14-15

Q41. The least count of the micrometer screw gauge described in the chapter is:

Difficulty: Medium

A) 1 mm

B) 0.1 mm

C) 0.01 mm

D) 0.001 mm

Correct Answer: Option C

Explanation: The screw gauge has a pitch of 0.5 mm and 50 circular scale divisions, so its least count is 0.01 mm.

Source Page: 14

Q42. In a micrometer screw gauge, the ratchet is used to:

Difficulty: Medium

A) Measure mass

B) Prevent over-tightening

C) Read the main scale

D) Convert mm into cm

Correct Answer: Option B

Explanation: The ratchet prevents excessive tightening by producing a click when the micrometer is ready to read.

Source Page: 15

Q43. A physical balance measures mass by:

Difficulty: Easy

A) Finding the volume of displaced water

B) Comparing unknown mass with known standard masses

C) Using a stopwatch

D) Reading a thermometer

Correct Answer: Option B

Explanation: A physical balance compares the object with known standard masses to find its mass.

Source Page: 16

Q44. In physics, weight differs from mass because weight is:

Difficulty: Medium

A) The amount of matter in a body

B) The force with which Earth attracts a body

C) Always measured in kilogram

D) Independent of gravity

Correct Answer: Option B

Explanation: Mass is the amount of matter in a body, while weight is the force due to Earth's attraction.

Source Page: 16

Q45. Which instrument is used for measuring the duration of an event?

Difficulty: Easy

A) Measuring cylinder

B) Stopwatch

C) Vernier calipers

D) Physical balance

Correct Answer: Option B

Explanation: A stopwatch is used to measure the time duration of an event.

Source Page: 17

Q46. A digital stopwatch can measure time more accurately because it may measure up to:

Difficulty: Medium

- A) One hour only
- B) One minute only
- C) One hundredth part of a second
- D) One metre

Correct Answer: Option C

Explanation: Electronic or digital stopwatches can measure up to one hundredth part of a second.

Source Page: 17

Q47. To read the volume of water in a measuring cylinder correctly, the eye should be:

Difficulty: Medium

- A) Above the top of cylinder
- B) Level with the lower meniscus
- C) Below the base of cylinder
- D) At any convenient angle

Correct Answer: Option B

Explanation: For water, the reading is taken at the lower meniscus with the eye kept level to avoid error.

Source Page: 17

Q48. The displacement can method is useful when a solid body:

Difficulty: Medium

- A) Dissolves in water
- B) Does not fit into a measuring cylinder
- C) Has no mass
- D) Is a liquid

Correct Answer: Option B

Explanation: If a solid does not fit into a measuring cylinder, a displacement can is used to collect and measure the displaced liquid.

Source Page: 18

Q49. Which statement describes systematic error?

Difficulty: Hard

- A) It occurs unpredictably in repeated readings
- B) It affects measurements in a consistent way
- C) It is only caused by emotions
- D) It can never be corrected

Correct Answer: Option B

Explanation: Systematic error affects all measurements in a particular way and often results from instrument faults or calibration problems.

Source Page: 19

Q50. Which example best represents a random error?

Difficulty: Hard

- A) Zero error in an instrument
- B) Poor calibration of a scale
- C) Sudden environmental fluctuation during readings
- D) Using the wrong unit intentionally

Correct Answer: Option C

Explanation: Random errors occur unpredictably, for example due to changes in temperature, pressure, humidity or voltage.

Source Page: 19

Q51. Why are multiple readings taken in an experiment?

Difficulty: Medium

- A) To make the instrument heavier
- B) To reduce the effect of random errors
- C) To remove units from answers
- D) To increase zero error

Correct Answer: Option B

Explanation: Taking several readings and calculating the average helps reduce the effect of random errors.

Source Page: 19

Q52. Uncertainty in a measurement is related to:

Difficulty: Medium

- A) The limitations of the measuring instrument
- B) The color of the instrument
- C) The observer's handwriting only
- D) The name of the unit only

Correct Answer: Option A

Explanation: Every measuring instrument has a smallest division, which limits the certainty of the measured value.

Source Page: 20

Q53. For an analogue instrument, the maximum uncertainty is commonly taken as:

Difficulty: Hard

- A) Equal to the full scale
- B) Half of the least count
- C) Twice the least count
- D) Always zero

Correct Answer: Option B

Explanation: For analogue readings, the maximum uncertainty is often taken as half of the least count of the instrument.

Source Page: 20

Q54. Significant figures include:

Difficulty: Medium

- A) Only uncertain digits
- B) Accurately known digits and the first doubtful digit
- C) Only zeros before a decimal
- D) Only the exponent in scientific notation

Correct Answer: Option B

Explanation: Significant figures are the digits known reliably along with the first doubtful digit in a measurement.

Source Page: 20-21

Q55. Which zero is significant?

Difficulty: Medium

- A) A zero before the first non-zero digit
- B) A zero between two non-zero digits
- C) A leading zero in 0.0034
- D) Any zero before a decimal point

Correct Answer: Option B

Explanation: Zeros between two non-zero digits are counted as significant figures.

Source Page: 21

Q56. How many significant figures are in 2.40 mm?

Difficulty: Medium

- A) 1
- B) 2
- C) 3
- D) 4

Correct Answer: Option C

Explanation: Zeros on the right side of a decimal are significant, so 2.40 has three significant figures.

Source Page: 21

Q57. Precision of a measurement depends mainly on:

Difficulty: Medium

- A) The least count of the instrument
- B) The color of the scale
- C) The name of the observer
- D) The shape of the object only

Correct Answer: Option A

Explanation: The smaller the least count of the instrument, the more precise the measurement can be.

Source Page: 21-22

Q58. Accuracy of a measurement means:

Difficulty: Easy

- A) Repeated readings are close to each other
- B) The measured value is close to the accepted true value
- C) The instrument is large
- D) The reading has no unit

Correct Answer: Option B

Explanation: Accuracy tells how close a measured value is to the true or accepted value.

Source Page: 21-22

Q59. If repeated readings are close to each other but not near the true value, they are:

Difficulty: Hard

- A) Precise but not accurate
- B) Accurate but not precise
- C) Both accurate and precise
- D) Neither precise nor accurate

Correct Answer: Option A

Explanation: Readings close to one another show precision, but if they are far from the true value, they are not accurate.

Source Page: 21

Q60. When rounding off, if the first dropped digit is greater than 5, the retained digit is:

Difficulty: Easy

- A) Decreased by one
- B) Increased by one
- C) Always kept the same
- D) Removed completely

Correct Answer: Option B

Explanation: If the first digit to be dropped is more than 5, one is added to the last retained digit.

Source Page: 22

Q61. Which rounding rule applies when the first dropped digit is less than 5?

Difficulty: Easy

- A) Increase the retained digit by one
- B) Keep the retained digit unchanged
- C) Delete the whole number
- D) Change the unit

Correct Answer: Option B

Explanation: If the digit to be dropped is less than 5, the retained digit remains unchanged.

Source Page: 22

Total MCQs	Easy	Medium	Hard
61	25	28	8