Al Amal Learning Center

Class 9 Physics Chapter 1 Advanced MCQ Quiz Online | Level 3

Class 9 Physics · Chapter 1: Physical Quantities and Measurement

Name: _____ Date: _____ Score: _____ / 48

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1. Which of the following quantities cannot be expressed in terms of the base quantities length, mass and time alone?

A) Force
B) Energy
C) Pressure
D) Electric current

2. A virus has a diameter of 2.5 × 10^-? m. What is its diameter in nanometres?

A) 0.25 nm
B) 25 nm
C) 250 nm
D) 2500 nm

3. How does the resultant of two perpendicular vectors compare with the sum of their magnitudes?

A) It is equal to the sum of their magnitudes
B) It is always less than the sum of their magnitudes
C) It is equal to the difference of their magnitudes
D) It is always greater than the sum of their magnitudes

4. Vector A is added to vector B by the head-to-tail method, and then vector B is added to vector A. What is the result?

A) The two resultants have different magnitudes but the same direction
B) The two resultants have the same magnitude but opposite directions
C) The two resultants are the same in both magnitude and direction
D) The second resultant is always zero

5. What is a reasonable estimate for the number of seconds in a human lifespan of 70 years?

A) 2 × 10? s
B) 2 × 10? s
C) 2 × 10^{11} s
D) 2 × 10? s

6. A student always reads the water level in a measuring cylinder with his eye above the meniscus. His repeated readings are very close to each other but all differ from the true volume in the same direction. How is this error best described?

A) A random error that reduces precision
B) A random error that averaging removes
C) An error caused only by faulty graduation of the cylinder
D) A personal systematic error that reduces accuracy

7. The true length of a rod is 10.0 cm. Four students each take three readings: Student P: 10.0, 10.1, 9.9 cm; Student Q: 10.4, 10.5, 10.4 cm; Student R: 9.0, 11.0, 10.0 cm; Student S: 12.0, 8.0, 14.0 cm. Which student is precise but not accurate?

A) Student P
B) Student Q
C) Student R
D) Student S

8. A length is reported as 2.50 cm instead of 2.5 cm. What does this show?

A) The last digit 0 is the doubtful digit, so the measurement is more precise
B) The zero is not significant, so both values mean the same
C) The length is exactly 2.5 cm with no uncertainty
D) The reading was taken with a less precise instrument

9. Which of the following numbers has exactly three significant figures?

A) 0.00023
B) 2.3 × 10^-?
C) 0.0230
D) 230.0

10. What is 4.9951 rounded to three significant figures?

A) 4.99
B) 4.995
C) 5.0
D) 5.00

11. Which of the following will NOT reduce random errors?

A) Taking more readings
B) Correcting the zero error of the instrument
C) Taking the mean of repeated readings
D) Timing several oscillations together

12. Which of the following quantity–unit pairs is NOT matched with its SI base unit?

A) Mass – gram
B) Temperature – kelvin
C) Electric current – ampere
D) Luminous intensity – candela

13. A new system uses a unit of length of 2 m and a unit of time of 1 s. What is a velocity of 10 m/s in this new system?

A) 20 units
B) 2 units
C) 5 units
D) 10 units

14. Which of the following is NOT written correctly in scientific notation?

A) 3.2 × 10?
B) 9.99 × 10^{-2}
C) 1.0 × 10?
D) 0.32 × 10?

15. A power station generates 45,000 MW. How much is this in gigawatts?

A) 0.045 GW
B) 4.5 GW
C) 45 GW
D) 450 GW

16. A ream of 500 sheets of paper has a total thickness of 5.0 cm. What is the thickness of one sheet?

A) 1 mm
B) 0.1 mm
C) 0.01 mm
D) 10 µm

17. A physical (beam) balance is used on the Moon, where gravity is weaker, to find the mass of a body. What will the mass found be, compared with Earth?

A) Smaller
B) Larger
C) Zero
D) The same

18. Which is a reasonable estimate for the volume of water in a drinking glass?

A) 2.5×10^{-1} m³
B) 2.5×10^{-2} m³
C) 2.5 × 10^-? m³
D) 2.5 × 10^-? m³

19. Which scalar quantity becomes a vector quantity when its direction is also specified?

A) Speed
B) Mass
C) Energy
D) Temperature

20. Which step improves the accuracy of a measuring instrument?

A) Repeating the reading many times and averaging
B) Taking readings with a steadier hand
C) Calibrating it against a standard
D) Writing the readings in scientific notation

21. Scenario: Ayesha is given a rectangular metal block. Using a physical balance, she finds its mass to be 270 g. Using a ruler, she finds its dimensions to be 5.0 cm × 4.0 cm × 3.0 cm. She then calculates its density. What is the volume of the block in m³?

A) 6.0 × 10^-? m³
B) 6.0 × 10^-? m³
C) 6.0×10^{-3} m³
D) 6.0×10^{-2} m³

22. Scenario: Ayesha is given a rectangular metal block. Using a physical balance, she finds its mass to be 270 g. Using a ruler, she finds its dimensions to be 5.0 cm × 4.0 cm × 3.0 cm. She then calculates its density. What is the density of the block in SI units?

A) 4.5 kg m^-3
B) 450 kg m^-3
C) 4500 kg m^-3
D) 45,000 kg m^-3

23. Scenario: Ayesha is given a rectangular metal block. Using a physical balance, she finds its mass to be 270 g. Using a ruler, she finds its dimensions to be 5.0 cm × 4.0 cm × 3.0 cm. She then calculates its density. Which base quantities are enough to define the unit of density?

A) Mass and time
B) Length and time
C) Mass, length and time
D) Mass and length

24. Scenario: Ayesha is given a rectangular metal block. Using a physical balance, she finds its mass to be 270 g. Using a ruler, she finds its dimensions to be 5.0 cm × 4.0 cm × 3.0 cm. She then calculates its density. She writes the density as 4.5000 × 10^3 kg m^-3. Why is this not acceptable?

A) It is not written in scientific notation
B) A derived quantity cannot have decimal digits
C) A result cannot be more precise than the measured data used to find it
D) Density must always be written in g cm^-3

25. Scenario: A drone flies 50 m towards the east and then 120 m towards the north. The whole trip takes 10 s. After that, it flies straight back to its starting point. What is the distance covered by the drone in the outward journey?

A) 130 m
B) 70 m
C) 170 m
D) 6000 m

26. Scenario: A drone flies 50 m towards the east and then 120 m towards the north. The whole trip takes 10 s. After that, it flies straight back to its starting point. What is the magnitude of the drone's displacement in the outward journey?

A) 130 m
B) 170 m
C) 70 m
D) 120 m

27. Scenario: A drone flies 50 m towards the east and then 120 m towards the north. The whole trip takes 10 s. After that, it flies straight back to its starting point. Which statement about the outward journey is correct?

A) Distance is a vector and displacement is a scalar
B) Both distance and displacement are vectors
C) Both are scalars and have the same value
D) Distance is a scalar (170 m), while displacement is a vector with magnitude 130 m

28. Scenario: A drone flies 50 m towards the east and then 120 m towards the north. The whole trip takes 10 s. After that, it flies straight back to its starting point. What are the total distance and the total displacement after the drone returns straight to its starting point?

A) 300 m and 0 m
B) 300 m and 300 m
C) 170 m and 0 m
D) 0 m and 300 m

29. Scenario: A student tests a kitchen scale by placing a standard 500 g mass on it five times. The scale shows 508 g, 507 g, 508 g, 508 g and 507 g. What is the mean reading of the scale?

A) 500.0 g
B) 507.6 g
C) 508.0 g
D) 7.6 g

30. Scenario: A student tests a kitchen scale by placing a standard 500 g mass on it five times. The scale shows 508 g, 507 g, 508 g, 508 g and 507 g. How can the readings of this scale be described?

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

31. Scenario: A student tests a kitchen scale by placing a standard 500 g mass on it five times. The scale shows 508 g, 507 g, 508 g, 508 g and 507 g. What kind of error is present in this scale?

A) A random error that averaging can remove
B) A human reaction-time error
C) A systematic error, because every reading is shifted the same way
D) No error, because the readings are close together

32. Scenario: A student tests a kitchen scale by placing a standard 500 g mass on it five times. The scale shows 508 g, 507 g, 508 g, 508 g and 507 g. What should be done to make this scale accurate?

A) Take 50 more readings and average them
B) Calibrate or adjust the scale using the standard mass
C) Use a heavier object
D) Round every reading to the nearest 10 g

33. Scenario: Sara prepares a poster with these facts: a sheet of paper is 80,000 nm thick, a hard disk can store 30 TB, a solar plant produces 2.5 × 10? W, and a bacterium is 2 µm long. What is the thickness of the sheet of paper in mm?

A) 0.008 mm
B) 0.08 mm
C) 0.8 mm
D) 8 mm

34. Scenario: Sara prepares a poster with these facts: a sheet of paper is 80,000 nm thick, a hard disk can store 30 TB, a solar plant produces 2.5 × 10? W, and a bacterium is 2 µm long. How many bytes can the hard disk store, in scientific notation?

A) 3 × $10^{1?}$ bytes
B) 3 × 10^{12} bytes
C) 3 × 10^{13} bytes
D) 3 × $10^{1?}$ bytes

35. Scenario: Sara prepares a poster with these facts: a sheet of paper is 80,000 nm thick, a hard disk can store 30 TB, a solar plant produces 2.5 × 10? W, and a bacterium is 2 µm long. What is the power of the solar plant in megawatts?

A) 0.25 MW
B) 25 MW
C) 2500 MW
D) 250 MW

36. Scenario: Sara prepares a poster with these facts: a sheet of paper is 80,000 nm thick, a hard disk can store 30 TB, a solar plant produces 2.5 × 10? W, and a bacterium is 2 µm long. How many such bacteria placed end to end would make a length of 1 mm?

A) 50
B) 500
C) 5000
D) 50,000

37. Scenario: In a physics lab, Zain measures a metal plate and records: length 12.35 cm, width 4.20 cm and thickness 0.250 cm. How many significant figures are there in the thickness 0.250 cm?

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

38. Scenario: In a physics lab, Zain measures a metal plate and records: length 12.35 cm, width 4.20 cm and thickness 0.250 cm. How is the width written in metres in scientific notation, keeping the same number of significant figures?

A) 4.2 × $10^{\wedge -2}$ m
B) 4.20 × $10^{\wedge -1}$ m
C) 4.20 × $10^{\wedge -2}$ m
D) 4.20 × 10^{2} m

39. Scenario: In a physics lab, Zain measures a metal plate and records: length 12.35 cm, width 4.20 cm and thickness 0.250 cm. What is the length rounded to three significant figures?

A) 12.3 cm
B) 12.4 cm
C) 12.35 cm
D) 12.0 cm

40. Scenario: In a physics lab, Zain measures a metal plate and records: length 12.35 cm, width 4.20 cm and thickness 0.250 cm. Why must the final zero in the width 4.20 cm be written?

A) It is only a place holder and has no meaning
B) It changes the size of the width
C) It is significant, because it shows the width was measured to the hundredths place
D) It makes the width an exact value with no uncertainty

41. Scenario: While flying a kite, Sana records: wind velocity 10 m/s towards the east, tension in the string 4 N, mass of the kite 0.3 kg, flying time 15 minutes and air temperature 30 °C. Which pair from her record contains only scalar quantities?

A) Wind velocity and tension
B) Tension and temperature
C) Mass and flying time
D) Wind velocity and mass

42. Scenario: While flying a kite, Sana records: wind velocity 10 m/s towards the east, tension in the string 4 N, mass of the kite 0.3 kg, flying time 15 minutes and air temperature 30 °C. Why must the direction of the wind be mentioned along with 10 m/s?

A) Because wind has no magnitude
B) Because velocity is a vector, so magnitude alone does not describe it completely
C) Because velocity is a scalar
D) Because direction changes the unit of velocity

43. Scenario: While flying a kite, Sana records: wind velocity 10 m/s towards the east, tension in the string 4 N, mass of the kite 0.3 kg, flying time 15 minutes and air temperature 30 °C. Two winds, 8 m/s towards the east and 15 m/s towards the north, act on the kite at the same time. What is the magnitude of their resultant?

A) 23 m/s
B) 7 m/s
C) 17 m/s
D) 120 m/s

44. Scenario: While flying a kite, Sana records: wind velocity 10 m/s towards the east, tension in the string 4 N, mass of the kite 0.3 kg, flying time 15 minutes and air temperature 30 °C. Which of these SI units is a derived unit?

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

45. Scenario: Ali finds the volume of an irregular stone using a measuring cylinder. The water level is 45 mL before and 62 mL after the stone is completely immersed. A physical balance gives the mass of the stone as 42.5 g. What is the volume of the stone?

A) 107 cm^3
B) 45 cm^3
C) 17 cm^3
D) 62 cm^3

46. Scenario: Ali finds the volume of an irregular stone using a measuring cylinder. The water level is 45 mL before and 62 mL after the stone is completely immersed. A physical balance gives the mass of the stone as 42.5 g. What is the density of the stone in g cm^-³?

A) 0.4 g cm^-³
B) 2.5 g cm^-³
C) 25 g cm^-³
D) 1.25 g cm^-³

47. Scenario: Ali finds the volume of an irregular stone using a measuring cylinder. The water level is 45 mL before and 62 mL after the stone is completely immersed. A physical balance gives the mass of the stone as 42.5 g. What is the density of the stone in SI units?

A) 2.5 kg m^-³
B) 25 kg m^-³
C) 250 kg m^-³
D) 2500 kg m^-³

48. Scenario: Ali finds the volume of an irregular stone using a measuring cylinder. The water level is 45 mL before and 62 mL after the stone is completely immersed. A physical balance gives the mass of the stone as 42.5 g. An air bubble clings to the stone while it is immersed. What is the effect on the result?

A) The measured volume is too small and the density is too high
B) The measured volume is too large and the density is too low
C) There is no effect on the volume or density
D) The mass of the stone changes

Answer key

1-D 2-C 3-B 4-C 5-B 6-D 7-B 8-A 9-C 10-D

11-B 12-A 13-C 14-D 15-C 16-B 17-D 18-C 19-A 20-C

21-B 22-C 23-D 24-C 25-C 26-A 27-D 28-A 29-B 30-C

31-C 32-B 33-B 34-C 35-D 36-B 37-B 38-C 39-B 40-C

41-C 42-B 43-C 44-C 45-C 46-B 47-D 48-B