

Test Bank - Chapter 1
Measurement and the Properties of Matter

- 1) Which of the following best describes the scientific method?
- A. A fixed sequence of steps to prove a theory
 - B. A systematic approach involving observation, hypothesis, and testing
 - C. A random trial-and-error process
 - D. A way to summarize data without experimentation
 - E. A means of organizing facts without forming conclusions
- 2) Which statement correctly distinguishes a law from a theory?
- A. A theory summarizes observations; a law explains them.
 - B. A law explains why phenomena occur; a theory predicts them.
 - C. A law summarizes observations; a theory explains them.
 - D. Both are identical in meaning.
 - E. A law is proven beyond doubt, while a theory is not.
- 3) Which of the following is a derived SI unit?
- A. Meter (m)
 - B. Kilogram (kg)
 - C. Kelvin (K)
 - D. Joule (J)
 - E. Mole (mol)
- 4) Which prefix represents 10^{-3} ?
- A. Micro-
 - B. Milli-
 - C. Centi-
 - D. Nano-
 - E. Pico-
- 5) The mass of an object is measured as 45.0 g. Which instrument was likely used?
- A. Thermometer
 - B. Volumetric pipet
 - C. Analytical balance
 - D. Graduated cylinder
 - E. Barometer
- 6) Which number is correctly written in scientific notation?
- A. 0.00057×10^4
 - B. 57×10^{-4}
 - C. 5.7×10^{-4}
 - D. 0.57×10^{-3}
 - E. 570×10^{-6}
- 7) The number 0.00450 has how many significant figures?
- A. 2

- B. 3
- C. 4
- D. 5
- E. 1

8) When multiplying 6.02×10^{23} by 3.0×10^{-24} , the result should have:

- A. 1 significant figure
- B. 2 significant figures
- C. 3 significant figures
- D. 4 significant figures
- E. 5 significant figures

9) A person runs 5.0 miles. If 1 mile = 1.609 km, the distance in kilometres is:

- A. 3.11 km
- B. 5.0 km
- C. 8.05 km
- D. 10.0 km
- E. 16.1 km

10) Which of the following represents a correct conversion factor?

- A. 1 m / 100 cm
- B. 100 cm / 1 m
- C. Both A and B
- D. Neither A nor B
- E. Depends on the calculation direction

11) Which of the following is a heterogeneous mixture?

- A. Air
- B. Vinegar
- C. Brass
- D. Sand and water
- E. Salt solution

12) Which statement correctly defines an element?

- A. A pure substance that can be broken into simpler substances chemically
- B. A mixture of compounds and molecules
- C. A substance composed of one type of atom
- D. A solid that cannot melt
- E. A compound of metals only

13) Which of the following is not a compound?

- A. Water
- B. Carbon dioxide
- C. Table salt
- D. Hydrogen gas
- E. Glucose

14) Which of the following best describes a solid?

- A. Definite volume, indefinite shape
- B. Indefinite volume and shape
- C. Definite shape and volume
- D. Compressible and fluid
- E. Flows freely and fills container

15) The main difference between gases and liquids is that gases:

- A. Are denser than liquids
- B. Are compressible
- C. Have definite volume
- D. Do not expand
- E. Contain atoms in fixed positions

16) Which of the following is a physical property?

- A. Ability to burn
- B. Reactivity with acid
- C. Color
- D. Corrosiveness
- E. Decomposition in heat

17) Which change is chemical?

- A. Ice melting
- B. Water boiling
- C. Salt dissolving in water
- D. Iron rusting
- E. Alcohol evaporating

18) Which statement correctly distinguishes between physical and chemical properties?

- A. Physical properties change the identity of a substance.
- B. Chemical properties can be observed without changing identity.
- C. Physical properties involve molecular rearrangement.
- D. Chemical properties describe how substances react to form new substances.
- E. Physical properties include reactivity.

19) Which is an extensive property?

- A. Density
- B. Temperature
- C. Mass
- D. Boiling point
- E. Color

20) Which of the following pairs are intensive properties?

- A. Mass and volume
- B. Volume and weight
- C. Density and temperature
- D. Weight and energy

E. Mass and length

21) Convert 125 °F to °C.

- A. -10.0 °C
- B. 52.0 °C
- C. 45.0 °C
- D. 38.0 °C
- E. 12.5 °C

22) The distance between two points is 8.5 cm. What is this distance in millimetres?

- A. 0.085 mm
- B. 0.85 mm
- C. 8.5 mm
- D. 85 mm
- E. 850 mm

23) The mass of an object is 0.0025 kg. Express this mass in grams.

- A. 25 g
- B. 2.5 g
- C. 0.25 g
- D. 250 g
- E. 0.025 g

24) A metal cube has a mass of 54.0 g and a volume of 20.0 cm³. What is its density?

- A. 0.37 g/cm³
- B. 1.08 g/cm³
- C. 2.70 g/cm³
- D. 3.00 g/cm³
- E. 4.00 g/cm³

25) A sample of liquid has a density = 1.26 g/mL and a mass = 63.0 g. What is its volume?

- A. 48.9 mL
- B. 63.0 mL
- C. 79.4 mL
- D. 50.0 mL
- E. 41.3 mL

26) The density of mercury is 13.6 g/mL. What mass of mercury occupies 5.00 mL?

- A. 68.0 g
- B. 6.80 g
- C. 0.368 g
- D. 136 g
- E. 68.5 g

27) A block of aluminium has a density of 2.70 g/cm³. What is the volume of 81.0 g of aluminium?

- A. 22.2 cm³

- B. 30.0 cm^3
- C. 0.033 cm^3
- D. 0.300 cm^3
- E. 81.0 cm^3

28) Which of the following measurements has 3 significant figures?

- A. 0.00450
- B. 0.0045
- C. 0.0045000
- D. 4.5×10^{-3}
- E. 45×10^{-3}

29) Perform the operation with correct significant figures:

(2.56×3.1)

- A. 7.9
- B. 7.94
- C. 7.936
- D. 8.0
- E. 7.9360

30) Add: $12.11 + 0.3 + 1.08$

- A. 13.49
- B. 13.5
- C. 13.490
- D. 13.0
- E. 14.0

31) Subtract: $25.00 - 2.3$

- A. 22.70
- B. 22.7
- C. 23
- D. 22.700
- E. 22.0

32) How many seconds are there in 2.50 hours?

- A. 150 s
- B. 360 s
- C. 7200 s
- D. 9000 s
- E. 90000 s

33) A car travels 90.0 km/h . What is its speed in m/s ?

- A. 15 m/s
- B. 20 m/s
- C. 25 m/s
- D. 30 m/s
- E. 40 m/s

34) Convert 7.50×10^2 mm to meters.

- A. 0.75 m
- B. 7.5 m
- C. 75 m
- D. 0.075 m
- E. 0.0075 m

35) A cylinder of gas has a volume of 10.0 L and contains gas with a mass of 12.8 g. What is the gas's density in g/mL?

- A. 1.28×10^{-3} g/mL
- B. 1.28 g/mL
- C. 0.128 g/mL
- D. 12.8 g/mL
- E. 0.0128 g/mL

36) A cube has edges of 2.50 cm and a mass of 40.0 g. What is its density?

- A. 2.56 g/cm³
- B. 6.4 g/cm³
- C. 10.0 g/cm³
- D. 5.00 g/cm³
- E. 1.25 g/cm³

37) If a temperature changed from 20.0 °C to 68.0 °F. What is the temperature change in Kelvin?

- A. 10 K
- B. 20 K
- C. 0 K
- D. 11 K
- E. -1 K

38) A student measures a sample's mass three times and obtains: 5.12 g, 5.13 g, 5.12 g, while the true mass is 5.50 g. These measurements are:

- A. Accurate and precise
- B. Accurate but not precise
- C. Precise but not accurate
- D. Neither accurate nor precise
- E. Uncertain

39) Random error in measurement affects:

- A. Precision only
- B. Accuracy only
- C. Both
- D. Neither
- E. Significant figures

40) At what temperature are the Celsius and Fahrenheit temperature scales equal?

- A. -32°
- B. -40°
- C. -273°
- D. 0°
- E. $+40^{\circ}$

41) Compute and report the answer with correct significant figures: (4.56×1.4)

- A. 6.384
- B. 6.38
- C. 6.4
- D. 6
- E. 6.0

42) Evaluate using correct significant figures: $(2.56 + 1.4) \times 3.0$

- A. 11.9
- B. 12.0
- C. 12
- D. 11.88
- E. 11.8

43) Which of the following numbers is ambiguous in terms of significant figures unless written in scientific notation?

- A. 0.0040
- B. 45.00
- C. 4000
- D. 4.000×10^3
- E. 0.0400

44) Which statement about exact numbers is correct?

- A. They have one significant figure.
- B. They have an infinite number of significant figures.
- C. They must always be measured.
- D. They are always rounded to the nearest whole number.
- E. They cannot be used in calculations involving measurements.

45) Add $12.11 + 0.3 + 1.456$. The sum should be reported as:

- A) 13.866
- B) 13.9
- C) 13.87
- D) 14
- E) 13.8660

46) A student rounds 0.09987 to 3 significant figures. Which of the following shows the correct result?

- A) 0.0998
- B) 0.0999
- C) 0.100

- D) 0.10
E) 0.099

47) Which of the following quantities is not expressed using only SI base units?

- A) Electric current (ampere)
B) Force (newton)
C) Luminous intensity (candela)
D) Mass (kilogram)
E) Time (second)

48) Which of the following statements is true?

- A) Liter is a SI derived unit for volume
B) Electronvolt is a SI base unit
C) Hertz is a derived SI unit for frequency
D) Inch is a SI derived unit
E) Celsius is a base SI unit

49) Systematic error in measurement affects:

- A. Precision only
B. Accuracy only
C. Both
D. Neither
E. Significant figures

50) A student rounds 0.09997 to 3 significant figures. Which of the following shows the correct result?

- A) 0.0998
B) 0.0999
C) 0.100
D) 0.10
E) 0.099

Answer Key:

1) B	2) C	3) D	4) B	5) C	6) C
7) B	8) B	9) C	10) C	11) D	12) C
13) D	14) C	15) B	16) C	17) D	18) D
19) C	20) C	21) B	22) D	23) B	24) C
25) D	26) A	27) B	28) A	29) A	30) B
31) B	32) D	33) C	34) A	35) A	36) A
37) C	38) C	39) A	40) B	41) C	42) C
43) C	44) B	45) B	46) B	47) B	48) C
49) B	50) C				