

States of Matter – MCQs

1. Which of the following has the weakest intermolecular forces?

- A) Solid
- B) Liquid
- C) Gas
- D) Plasma

2. Boyle's law states that:

- A) $P \propto V$ (at constant T)
- B) $P \propto 1/V$ (at constant T)
- C) $V \propto T$ (at constant P)
- D) $PV \propto T$

3. The SI unit of pressure is:

- A) mmHg
- B) atm
- C) Torr
- D) Pascal (Pa)

4. According to Charles's law, at constant pressure, the volume of a gas is directly proportional to:

- A) Temperature (in °C)
- B) Temperature (in K)
- C) Pressure
- D) Mass

Answer: B

5. Which of the following gases will diffuse the fastest?

- A) O₂
- B) H₂
- C) N₂
- D) Cl₂

6. The compressibility factor (Z) is equal to 1 for:

- A) Ideal gas
- B) Real gas
- C) Liquids
- D) Solids

7. Which of the following is not an assumption of the kinetic molecular theory of gases?

- A) Gas particles move randomly
- B) Gas particles occupy volume
- C) Collisions are elastic
- D) No forces act between gas particles

8. At constant temperature, the pressure of a gas increases when volume:

- A) Increases
- B) Decreases
- C) Remains same
- D) Doubles

Answer: B

9. The value of universal gas constant R in SI units is:

- A) 0.0821 L·atm/mol·K
- B) 1.987 cal/mol·K
- C) 8.314 J/mol·K
- D) 62.3 L·Torr/mol·K

10. Which of the following substances exists in all three physical states at room temperature and atmospheric pressure?

- A) Mercury
- B) Iodine
- C) Water
- D) Carbon dioxide

11. Which law relates pressure and temperature at constant volume?

- A) Boyle's law
- B) Charles's law
- C) Gay-Lussac's law
- D) Avogadro's law

12. The volume occupied by one mole of an ideal gas at STP is:

- A) 22.4 L
- B) 1 L
- C) 0.0821 L
- D) 273 L

13. Which state of matter has a definite volume but no definite shape?

- A) Solid
- B) Liquid
- C) Gas
- D) Plasma

14. The pressure exerted by a gas is due to:

- A) The weight of gas
- B) Collisions of gas molecules with the container walls
- C) Chemical reactions of the gas
- D) Movement of electrons

15. The relation $PV=nRT$ represents:

- A) Boyle's law
- B) Charles's law
- C) Ideal gas law
- D) Dalton's law

16. Which of the following decreases with increasing temperature?

- A) Kinetic energy
- B) Vapor pressure
- C) Surface tension
- D) Diffusion rate

17. Real gases behave ideally at:

- A) High temperature and low pressure
- B) Low temperature and high pressure
- C) Low temperature and low pressure
- D) High temperature and high pressure

18. The boiling point of a liquid increases when:

- A) External pressure increases
- B) Altitude increases
- C) Vapor pressure increases
- D) Temperature decreases

19. The intermolecular force present in H₂O is:

- A) Ionic bonding
- B) Covalent bonding
- C) Van der Waals forces
- D) Hydrogen bonding

20. Which of the following has the highest density at room temperature?

- A) Water (liquid)
- B) Ice (solid)
- C) Steam (gas)
- D) All have the same density

Answer Key

- 1. C
- 2. B
- 3. D
- 4. B
- 5. B
- 6. A
- 7. B
- 8. B
- 9. C
- 10. C
- 11. C
- 12. A
- 13. B
- 14. B
- 15. C
- 16. C
- 17. A
- 18. A
- 19. D
- 20. A