States of Matter MCQ with Answers

1. The states of matter having no definite shape but definite volume:

(A) Gas
(B) Liquid
(C) Solid
(D) None of the Above

Answer: Liquid

2. The law, which states that at constant temperature, the volume of a given mass of gas is inversely proportional is pressure, is known as:

(A) Boyles law
(B) Charles law
(C) Combine gas law
(D) Avogadros law

Answer: Boyles law

3. The state of matter that shows the uniformity of behavior:

(A) Solid Liquid
(B) Liquid
(C) Gas
(D) None of the Above

Answer: Gas

4. With regard to the gaseous state of matter which of the following statements are correct?

(A) Complete disorder of molecules
(B) Random motion of molecules
(C) Both of these
(D) None of these

Answer: Both of these

5. Which of the following property of water can be used to explain the spherical the shape of rain droplets?

(A) viscosity
(B) surface tension
(C) critical phenomena
(D) pressure

Answer: surface tension

6. A person living in Shimla observed that cooking food without using pressure cooker takes more time. The reason for this observation is that at high altitude:

(A) pressure increases
(B) temperature decreases
(C) pressure decreases

(D) temperature increases

Answer: pressure decreases

7. How does the surface tension of a liquid vary with increase in temperature?

(A) Remains same
(B) Decreases
(C) Increases
(D) No regular pattern is followed

Answer: Decreases

8. The value of gas constant per degree per mole is approximately

(A) 1 Cal
(B) 2 cal
(C) 3 cal
(D) 4 cal

Answer: 2 cal

9. The rate of diffusion of methane at a given temperature is twice of a gas X. The molecular weight of X is

(A) 64
(B) 16
(C) 32
(D) 8

Answer: 64

10. What is SI unit of viscosity coefficient (η)?

(A) Pascal
(B) Ns m^{-2}
(C) $km^{-2}s$
(D) N m^{-2}

Answer: Ns m^{-2}

11. Which of the following gases will have the highest rate of diffusion?

(A) O_2
(B) C O_2
(C) NH_3
(D) N_2

Answer: NH_3

12. Which one of the following is not a unit of pressure

(A) Kg m/s^2
(B) Torr
(C) Pascal
(D) Bar

Answer: Kg m/s^2

13. Vander Waal's constants 'a' and 'b' are related with _____ respectively

(A) Attractive force and bond energy of molecules
(B) Volume and repulsive force of molecules

(C) Shape and repulsive forces of molecules
(D) Attractive force and volume of the molecules
Answer: Attractive force and volume of the molecules

14. A real gas most closely approaches the behavior of an ideal gas at
(A) 16 atm and 200 K
(B) 1 atm and 273 K
(C) 15 atm and 600 K
(D) 0.1 atm and 400 K
Answer: 0.1 atm and 400 K

15. When you heat a sample of gas, what happens to the particles that make up the gas?
(A) The particles move faster.
(B) The particles break apart
(C) The particles get smaller
(D) The particles become more dense
Answer: The particles move faster.

16. If helium and methane are allowed to diffuse out of the container under the similar conditions of temperature and pressure, then the ratio of rate of diffusion of helium to methane is:
(A) 2 : 1
(B) 1 : 2
(C) 3 : 5
(D) 4 : 1
Answer: 2 : 1

17. The rates of diffusion of gases are inversely proportional to square root of their densities. This statement refers to:
(A) Daltons Law
(B) Grahams Law
(C) Avogadros Law
(D) None of the Above
Answer: Grahams Law

18. Falling drop of water is spherical due to:
(A) Hydrogen Bonding
(B) Surface Tension
(C) Capillary Action
(D) Vlscosity
Answer: Surface Tension

19. The theory which explains that gases consist of molecules, which are in rapid option is known as:
(A) Daltons Atomic Theory
(B) Bohrs Theory
(C) Rutherfords Atomic Theory
(D) Kinetic Molecular Theory

Answer: Kinetic Molecular Theory

20. The rise or fall of a liquid within a tube of small bore is called:

(A) Surface Tension
(B) Capillary Action
(C) Viscosity
(D) Formation of Curvature

Answer: Capillary Action

21. The critical volumes of four gases A, B, C, D are respectively 0.025 L, 0.312 L, 0.245 L, 0.432 L, the gas with highest value of van der Wall constant b is

(A) A
(B) B
(C) C
(D) D

Answer: D

22. The value of universal gas constant R depends on

(A) Temperature of Gas
(B) Volume of Gas
(C) Number of Moles of Gas
(D) Units of Volume, Temperature and Pressure

Answer: Units of Volume, Temperature and Pressure

23. A gas deviates from ideal behavior at a high pressure because its molecules:

(A) Attract one another
(B) Show the Tyndall Effect
(C) Have kinetic energy
(D) Are bound by covalent bonds

Answer: Attract one another

24. Which of the following changes decrease the vapour pressure of water kept in a sealed vessel?

(A) Decreasing the quantity of water
(B) Adding salt to the water
(C) Decreasing the volume of the vessel to one-half
(D) Decreasing the temperature of the water

Answer: B, D

25. Under which of the following two conditions applied together, a gas deviates most from the ideal behaviour?

(A) Low pressure
(B) High pressure
(C) Low temperature
(D) High temperature

Answer: B, C

26. Which of the following figures does not represent 1 mole of dioxygen gas at STP?

(A) 16 grams of gas
(B) 22.7 litres of gas
(C) 6.022 × 1023 dioxygen molecules
(D) 11.2 litres of gas

Answer: A, D

27. How does the surface tension of a liquid vary with an increase in temperature?

(A) Remains the same
(B) Decreases
(C) Increases
(D) No regular pattern is followed

Answer: Decreases

28. Increase in kinetic energy can overcome intermolecular forces of attraction. How will the viscosity of liquid be affected by the increase in temperature?

(A) Increase
(B) No effect
(C) Decrease
(D) No regular pattern will be followed

Answer: Decrease

29. What is the SI unit of viscosity coefficient (η)?

(A) Pascal
(B) Nsm–2
(C) km–2 s
(D) N m–2

Answer: Nsm–2

30. Find the molecular mass of a gas that takes three times more time to effuse as compared to He with the same volume

(A) 9 u
(B) 64 u
(C) 27 u
(D) 36 u

Answer: 36 u

31. A gas described by van der Waals equation(A) behaves similar to an ideal gas in the limit of large molar volumes (B) behaves similar to an ideal gas in the limit of large pressures (C) is characterized by van der Waals coefficients that are dependent on the identity of the gas but are independent of the temperature. (D) has the pressure that is lower than the pressure exerted by the same gas behaving ideally. Choose the correct option from below :

(A) (A) and (B) are correct
(B) (A) and (C) are correct

(C) (A), (B) and (D) are correct
(D) (A) ,(C) and (D) are correct
Answer: (A) ,(C) and (D) are correct

32. Which of the following gas molecules has the largest mean free path?
(A) O_2
(B) N_2
(C) H_2
(D) Cl_2
Answer: H_2

33. A person living in Nainital observed that cooking food without using pressure cooker takes more time. The reason for this observation is that at high altitude:
(A) pressure increases
(B) temperature decreases
(C) pressure decreases
(D) temperature increases
Answer: pressure decreases

34. Temperature which is same in both Celsius scale and Fahrenheit scale:
(A) 0°C
(B) 32°F
(C) -40°
(D) 40°C
Answer: -40°

35. Behavior of real gases near to that of ideal gases if:
(A) Low pressure and low temperature
(B) High Pressure and low temperature
(C) Low pressure and high temperature
(D) High Pressure and high temperature
Answer: Low pressure and high temperature

36. Compressibility factor for ideal gas is
(A) 0
(B) lies between 0 and 1
(C) 1
(D) Greater than 1
Answer: 1

37. One gram molecule of a gas at N.T.P. occupies 22.4 litres? This fact was derived from
(A) Dalton's theory
(B) Avogadro's hypothesis
(C) Grahm's law
(D) Law of gaseous volume
Answer: Avogadro's hypothesis

38. In the ideal gas equation, the gas constant R has the dimensions

(A) mole-atm K^{-1}
(B) erg K^{-1}
(C) litre-atm K^{-1} $mole^{-1}$
(D) litre mole

Answer: litre-atm K^{-1} $mole^{-1}$

39. Rate of diffusion of a gas is

(A) Directly proportional to its density
(B) Directly proportional to its molecular mass
(C) Directly proportional to the square root of its molecular mass
(D) Inversely proportional to the square root of its molecular mass

Answer: Inversely proportional to the square root of its molecular mass

40. In van der Waal equation of state of gas laws, the constant b is a measure of

(A) Intermolecular collisions per unit volume
(B) Intermolecular attraction
(C) Volume occupied by the molecules
(D) Intermolecular repulsions

Answer: Volume occupied by the molecules

41. Which of the following statement is wrong for gases?

(A) Gases do not have definite shape and volume
(B) Volume of the gas is equal to the volume of the container confining the gas
(C) Confined gas exert uniform pressure on the wall of the container in all directions
(D) Mass of the gas cannot be determined by weighing a container in which it is contained

Answer: Mass of the gas cannot be determined by weighing a container in which it is contained

42. The rate of diffusion methane is twice that of X. The molecular mass of X is

(A) 64.0
(B) 32.0
(C) 40
(D) 80

Answer: 64.0

43. Name the liquid with higher vapour pressure in the following pairs:

(A) Alcohol, Water, Petrol
(B) Petrol, Water, Alcohol
(C) Alcohol, Petrol, Water
(D) None of these

Answer: Alcohol, Petrol, Water

44. The vapour pressure of water at 300 K in a closed container is 0.4 atm. If the volume of container is doubled, its vapour pressure at 300 K will be

(A) 0.8 atm
(B) 0.2 atm
(C) 0.4 atm
(D) 0.6 atm
Answer: 0.4 atm

45. Find the fraction of the total pressure exerted by hydrogen if it is mixed with ethane in an empty container at 25℃

(A) 15/16
(B) 1/16
(C) 1/2
(D) 1
Answer: 15/16

46. If 1.204 x 10^{21} molecules of H2SO4 are removed from 392 mg of H_2SO_4, find the moles of H_2SO_4 left.

(A) 4 x 10^{-3}
(B) 1.5 x 10^{-3}
(C) 1.2 x 10^{-3}
(D) 2 x 10^{-3}
Answer: 2 x 10^{-3}

47. Find the temperature at which the rate of effusion of N2 is 1.625 times to that of SO2 at 500℃

(A) 620℃
(B) 173℃
(C) 110℃
(D) 373℃
Answer: 620℃

48. At the same temperature, the average molar kinetic energy of N_2 and CO is

(A) $KE_1 > KE_2$
(B) $KE_1 < KE_2$
(C) $KE_1 = KE_2$
(D) Insufficient information given
Answer: $KE_1 = KE_2$

49. How many of the know elements exist as gases at 25°C?

(A) 9
(B) 11
(C) 12
(D) 15
Answer: 11

50. The volume of 2.8 g of carbon monoxide at 27°C and 0.0821 atm is

(A) 30 L
(B) 3 L

(C) 0.3 L
(D) 1.5 L
Answer: 30 L