



CHEMISTRY

BOOKS - TARGET CHEMISTRY

(HINGLISH)

STATES OF MATTER (GASES AND LIQUIDS)

Classical Thinking

1. If P, V, T represent pressure, volume and temperature of the gas, the CORRECT representation of Boyle's law is

A. $V \propto \frac{1}{T}$ (at constant P and n)

B. $PV = T$

C. $P \propto \frac{1}{V}$ (at constant T and n)

D. $PV = \frac{1}{T}$

Answer: C



Watch Video Solution

2. At constant T and n , Boyle's law can be mathematically stated as _____

A. $PV=K$

B. $\frac{P}{V} = T$

C. $P + V = K$

D. $P - V = K$

Answer: A



Watch Video Solution

3. For a given mass of an ideal gas, which of the following statements is CORRECT ?

A. At a constant temperature, the pressure is directly proportional to the density of a gas.

B. At a constant temperature, the pressure is directly proportional to the volume of a gas

C. At a constant pressure, the volume is inversely proportional to the temperature

of a gas.

D. At a constant volume, pressure is inversely proportional to the temperature of a gas.

Answer: A



Watch Video Solution

4. Which property is kept constant in verification of Charles' law ?

A. Pressure

B. Volume

C. Temperature

D. Both (B) and (C)

Answer: A



Watch Video Solution

5. Which of the following expression at constant pressure represents Charles's law?

A. $V \propto \frac{1}{T}$

B. $V \propto \frac{1}{T^2}$

C. $V \propto T$

D. $V \propto d$

Answer: C



Watch Video Solution

6. _____ $^{\circ}C$ is absolute zero temperature.

A. 237.15

B. 273.15

C. -273.15

D. -237.15

Answer: C



Watch Video Solution

7. On absolute temperature scale, $-10^{\circ}C$ is

_____.

A. 263.15K

B. 283.15K

C. 290.15K

D. 310.15K

Answer: A



Watch Video Solution

8. At _____, the volume of a given mass of gas is double as compared to its volume at $0^{\circ} C$. Pressure is kept constant throughout.

A. $-273.15^{\circ} C$

B. $0^{\circ}C$

C. $100^{\circ}C$

D. $273.15^{\circ}C$

Answer: D



Watch Video Solution

9. If V_0 is the volume of a given mass of gas at $273K$ at a constant pressure then according to Charles' law, the volume at $10^{\circ}C$ will be _____.

A. $11V_0$

B. $\frac{1}{273}(V_0 + 10)$

C. $V_0 + \frac{10}{273}$

D. $\frac{283}{273}V_0$

Answer: D



Watch Video Solution

10. Mathematical expression of Gay Lussac's law is given as _____.

A. $P \propto V$

B. $P \propto \frac{1}{T}$

C. $P \propto \frac{1}{V}$

D. $P \propto T$

Answer: D



Watch Video Solution

11. The graph of pressure vs temperature according to Gay Lussac's law is _____

.

- A. straight line parallel to X axis
- B. straight line parallel to Y axis
- C. straight line passing through origin
- D. straight line with negative slope

Answer: C



Watch Video Solution

12. When the pressure of 5 L of N_2 is double and its temperature is raised from 300 K to 600 K, the final volume of the gas would be

A. 5L

B. 10L

C. 15L

D. 20L

Answer: A



Watch Video Solution

13. At constant T and P , Avogadro law is represented as _____.

A. $V \propto N_A$

B. $V \propto \frac{1}{n}$

C. $V \propto n$

D. $V \propto \frac{1}{N_A}$

Answer: C



Watch Video Solution

14. The volume occupied by 1 mole of a gas when pressure is 1 atm and temperature is 273.15K is _____.

A. $2.24dm^3$

B. $22.4dm^3$

C. $224dm^3$

D. $22400dm^3$

Answer: B



Watch Video Solution

15. For n moles of an ideal gas, the ideal equation may be written as _____.

A. $PT/n = RV$

B. $PV = (RT)^2$

C. $PV = nRT$

D. $PV = RT/n$

Answer: C



Watch Video Solution

16. An ideal gas equation is obeyed fairly well by all gases at _____.

- A. high pressure and high temperature.
- B. high pressure and low temperature
- C. low pressure and high temperature
- D. under ordinary conditions at room temperature and pressure

Answer: C



Watch Video Solution

17. Combined gas equation is CORRECTLY represented as _____.

A. $\frac{V_1 T_2}{P_1} = \frac{V_2 T_1}{P_2}$

B. $\frac{P_1 V_1}{P_2 V_2} = \frac{T_1}{T_2}$

C. $\frac{P_1 T_2}{V_1} = \frac{P_2 V_2}{T_2}$

D. $\frac{V_1 V_2}{T_1 T_2} = P_1 P_2$

Answer: B



Watch Video Solution

18. CORRECT value of gas constant 'R' is _____.

A. $8.2 \text{ Cal. } K^{-1} \text{ mol}^{-1}$

B. $8.314 \text{ JK}^{-1} \text{ mol}^{-1}$

C. $8.2 \text{ Latm } K^{-1} \text{ mol}^{-1}$

D. $1.987 \text{ erg } K^{-1} \text{ mol}^{-1}$

Answer: B



Watch Video Solution

19. When unit of pressure is atm and that of volume is dm^3 then unit of R is _____.

A. $JK^{-1}mol^{-1}$

B. $atm\ dm^3\ K^{-1}mol^{-1}$

C. $atm\ K^{-1}mol^{-1}$

D. $atm\ dm^3\ K^{-1}$

Answer: B



Watch Video Solution

20. The Temperature at which 28 g of N_2 will occupy a volume of 10.0 L at 2.46 atm is

A. 273K

B. 299.63K

C. 373K

D. 399.65K

Answer: B



Watch Video Solution

21. _____ gas is easy to liquefy due to strong intermolecular forces of attraction.

A. Hydrogen

B. Chlorine

C. Oxygen

D. Nitrogen

Answer: B



Watch Video Solution

22. In case of hydrogen , molar volume at STP is
_____ 22.414L.

A. more than

B. less than

C. equal to

D. double of

Answer: A



Watch Video Solution

23. The temperature at which a real gas obeys the ideal gas laws over a wide range of pressure is called

A. critical

B. Boyle

C. inversion

D. reduced

Answer: B



Watch Video Solution

24. Thomas Andrew measured variation of the volume with pressure of _____ at different constant temperatures.

A. CO_2

B. He

C. H_2

D. NH_3

Answer: A



View Text Solution

25. A gas can be liquefied by _____.

A. cooling

B. compressing

C. both cooling and compressing

D. either cooling or compressing

Answer: C



Watch Video Solution

26. As observed from Andrew's isothermals of CO_2 , critical temperature of CO_2 is _____ $^{\circ}C$

A. 13.1

B. 24.05

C. 30.98

D. 48.1

Answer: C



View Text Solution

27. According to Andrews isothermals, CO_2 gas behaves ideally _____.

A. at and above $48.1^\circ C$

B. below $25^{\circ} C$

C. at $30.98^{\circ} C$

D. below $13.1^{\circ} C$

Answer: A



View Text Solution

28. _____ modified Linde process such that the cooling becomes more efficient.

A. Claude

B. Joule

C. Thomson

D. Planck

Answer: A



View Text Solution

29. Which of the following is NOT a postulate of the kinetic molecular theory of gases?

A. The gas molecules are in random motion.

B. The collisions between the molecules are perfectly elastic.

C. The average kinetic energy per molecule of different gases is equal at a given temperature.

D. The pressure exerted by a gas is due to intermolecular forces.

Answer: D



Watch Video Solution

1. Which of the following is INCORRECT regarding instantaneous dipole moment ?

A. It is a non zero dipole moment of a non-polar molecule and is valid for small time interval.

B. During the instant of instantaneous dipole moment, the centres of positive and

negative charges of an atom do not coincide.

C. Sum of all the instantaneous dipole moment gives the value of total dipole moment of the non-polar molecule.

D. Instantaneous dipoles induce permanent dipoles in the atoms or molecules in the vicinity and produce dispersion forces.

Answer: D



View Text Solution

2. The boiling point of H_2O is more than that of ONF because of _____.

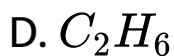
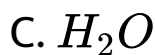
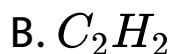
- A. hydrogen bonding
- B. London forces
- C. dipole-induced dipole interaction
- D. nuclear forces

Answer: A



Watch Video Solution

3. Which of the following has strong intermolecular hydrogen bonding ?



Answer: C



Watch Video Solution

4. Which of the following has the strongest hydrogen bonding ?

A. Two NH_3 molecules

B. Two H_2O molecules

C. Two HF molecules

D. All have equal strength of H-bonds

Answer: C



Watch Video Solution

5. The boiling point of _____ is low due to absence of hydrogen bonding.



Answer: D



Watch Video Solution

6. Which of the following is a poisonous gas ?

A. Oxygen

B. Nitrogen

C. Chlorine

D. Ozone

Answer: C



Watch Video Solution

7. When temperature is $-40^{\circ}C$, it can be written as _____ $^{\circ}F$.

A. -40

B. 40

C. 72

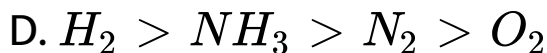
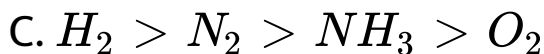
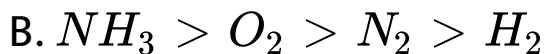
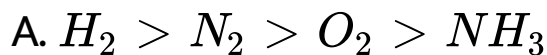
D. 233

Answer: A



Watch Video Solution

8. The gases H_2 , N_2 , O_2 and NH_3 will diffuse in the order :



Answer: D



Watch Video Solution

9. For a certain amount of an ideal gas at constant temperature, _____.

A. volume always remains constant

B. pressure always remains constant

C. product of pressure and volume remains constant.

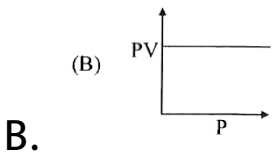
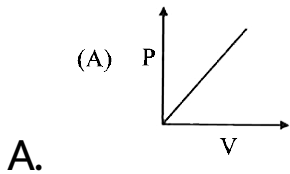
D. the ratio of pressure and volume always remains constant.

Answer: C

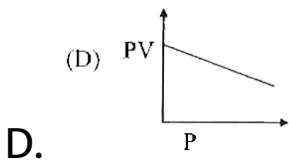


Watch Video Solution

10. Which of the following graph represent Boyle's law ?



C. 



Answer: B



Watch Video Solution

11. At what pressure will a quantity of a gas, which occupies 100mL at a pressure of 720 mm, occupy a volume of 84 mL ?

[Temperature is constant throughout the process.]

A. 736.18mm

B. 784.15mm

C. 820.20mm

D. 857.14mm

Answer: D



Watch Video Solution

12. At constant temperature, a quantity of an ideal gas occupies, 50mL at 500 mm Hg pressure. At what volume, the pressure will be 250 mm Hg ?

A. 100mL

B. 200 mL

C. 25 mL

D. 150 mL

Answer: A



Watch Video Solution

13. The volume of a given mass of a given at $12^{\circ}C$ is $2dm^3$. The temperature at which of the same gas has volume of $3.4dm^3$ is _____.

A. $200^{\circ}C$

B. $211.5^{\circ}C$

C. 200K

D. 2.11.5K

Answer: B



Watch Video Solution

14. A gas at $10^{\circ}C$ occupies a volume of 283mL. If it is heated to $20^{\circ}C$, keeping the pressure constant, the new volume will be _____.

A. 283mL

B. 293 mL

C. 566 mL

D. 586 mL

Answer: B



Watch Video Solution

15. At 300 K, a certain mass of a gas occupies $1 \times 10^{-4} dm^3$ volume. Its volume at 450 K at the same pressure is _____.

A. $1 \times 10^{-4} dm^3$

B. $1.5 \times 10^{-4} dm^3$

C. $2 \times 10^{-4} dm^3$

D. $2.5 \times 10^{-4} dm^3$

Answer: B



Watch Video Solution

16. A certain sample of gas has a volume of 0.2 litre measured at $1atm$ pressure and $0^\circ C$. At the same pressure but at $273^\circ C$, its volume will be

A. 0.4 litres

B. 0.8 litres

C. 27.8 litres

D. 55.6 litres

Answer: A



Watch Video Solution

17. 400cm^3 of oxygen at 27°C were cooled to -3°C without change in pressure. The contraction in volume will be as per Charle's law?

A. 30cm^3

B. 40cm^3

C. 44.4cm^3

D. 360cm^3

Answer: B



Watch Video Solution

18. At what temperature in the Celsius scale, V (volume) of a certain mass of a gas at 27°C will be doubled keeping the pressure constant ?

A. 54°C

B. $327^{\circ}C$

C. $427^{\circ}C$

D. $527^{\circ}C$

Answer: B



Watch Video Solution

19. At a constant pressure, what should be the percentage increase in the temperature in kelvin for a 10 % increase in the volume

A. 0.05

B. 0.1

C. 0.2

D. 0.5

Answer: B



Watch Video Solution

20. If 10g of a gas at atmospheric pressure is cooled from $273^{\circ}C$ to $0^{\circ}C$, keeping the volume constant, its pressure would become

A. $1/2 \text{ atm}$

B. $1/273$ atm

C. 2 atm

D. 273 atm

Answer: A



Watch Video Solution

21. A vessel contains 1 mole of O_2 gas (relative molar mass 32) at a temperature T . The pressure of the gas is P . An identical vessel containing

one mole of He gas (relative molar mass 4) at temperature $2T$ has a pressure of

A. $P/8$

B. P

C. $2P$

D. $8P$

Answer: C



Watch Video Solution

22. Which of the next represents the Avogadro number ?

A. Number of molecules present in 1L of a gas at N.T.P.

B. Numbr of molecules present in 22.4 L of a gas at N.T.P.

C. Number of molecules present in $1dm^3$ of a gas at 298K and 1 atm.

D. Number of molecules present in one mole of a gas at any temperature and pressure.

Answer: B



Watch Video Solution

23. Hydrogen and argon are kept in two separate but identical vessel at constant temperature and pressure, then which of the following is CORRECT ?

A. Both contain same number of atoms.

B. The number of atoms of argon is half than that of hydrogen.

C. The number of atoms of argon is double than that of hydrogen

D. The number of atom of argon is $1/4^{th}$ than that of hydrogen.

Answer: B



Watch Video Solution

24. Five grams each of the following gases at $87^{\circ}C$ and 750 mm pressure are taken. Which of them will have the least volume ?

A. HF

B. HCl

C. HBr

D. HI

Answer: D



Watch Video Solution

25. Among the following conditions of temperature and pressure, the density of neon will be highest at _____.

A. S.T.P.

B. $0^{\circ}C$, 2atm

C. $273^{\circ}C$, 1 atm

D. $273^{\circ}C$, 2 atm

Answer: B



Watch Video Solution

26. Which of the following statements is NOT true for an ideal gas ?

A. There is no interaction between the molecules.

B. It cannot be converted into a liquid.

C. All molecules of the gas move with the same speed.

D. At a given temperature, PV is proportional to the amount of the gas.

Answer: C



Watch Video Solution

27. Which of the following is the INCORRECT value of gas constant (R) ?

A. $0.082 \text{ L atm mol}^{-1} \text{ K}^{-1}$

B. $8.314 \times 10^7 \text{ erg K}^{-1} \text{ mol}^{-1}$

C. $8.314 \text{ JK}^{-1} \text{ mol}^{-1}$

D. $4.183 \text{ Cal K}^{-1} \text{ mol}^{-1}$

Answer: D



Watch Video Solution

28. The constant R is _____.

- A. work done per molecule
- B. work done per degree absolute
- C. work done per Kelvin per mole
- D. work done per mole

Answer: C



Watch Video Solution

29. If the volume of 2 moles of an ideal gas at 540 K is 44.8 litres then its pressure will be

A. 1 atmosphere

B. 2 atmosphere

C. 3 atmosphere

D. 4 atmosphere

Answer: B



Watch Video Solution

30. The volume occupied by 2 mole of an ideal gas at $3 \times 10^5 Nm^{-2}$ pressure and 300 K temperature ($R = 8.314 JK^{-1} mol^{-1}$) is

A. $1.66 dm^3$

B. $16.6 dm^3$

C. $18.6 dm^3$

D. $32.2 dm^3$

Answer: B



Watch Video Solution

31. 2 gm of O_2 at $27^\circ C$ and 760 mm of Hg pressure has volume _____.

A. 1.5 L

B. 2.8 L

C. 11.2 L

D. 22.4 L

Answer: A



Watch Video Solution

32. The volume of 1g each of methane (CH_4) ethane (C_2H_6) , propane (C_3H_8) and butane (C_4H_{10}) was measured at 350 K and 1 atm.

What is the volume of butane ?

A. $495cm^3$

B. $600cm^3$

C. $900cm^3$

D. $1700cm^3$

Answer: A



Watch Video Solution

33. 16 g of oxygen and 3g of hydrogen are mixed and kept at 760mm of Hg pressure and 0°C . The total volume occupied by the mixture will be nearly _____.

A. 22.4 litres

B. 33.6 litres

C. 448 litres

D. 44800 mL

Answer: D



Watch Video Solution

34. If the absolute temperature of a gas is doubled and the pressure is reduced to one-half, the volume of the gas will _____

A. remain unchanged

B. be doubled

C. increase four-fold

D. be reduced to $1/4^{th}$

Answer: C





35. In an experiment during the analysis of a carbon compound, 145L of H_2 was collected at 760 mm of Hg pressure and $27^\circ C$ temperature. The mass of H_2 is near.

A. 6g

B. 10g

C. 12g

D. 24g

Answer: C



Watch Video Solution

36. Densities of two gases are in the ratio $1:2$ and their temperatures are in the ratio $2:1$, then the ratio of their respective pressure is

A. $1:1$

B. $1:2$

C. $2:1$

D. $4:1$

Answer: A



Watch Video Solution

37. Containers A and B have same gases. Pressure, volume and temperature of A are all twice that of B, then the ratio of number of molecules of A and B are

A. 1:2

B. 2:1

C. 1:4

D. 4: 1

Answer: B



Watch Video Solution

38. If P , V , M , T and R are symbols of pressure, volume, molecular weight, temperature and Gas constant, what is the equation of density of ideal gas

A. $\frac{RT}{PM}$

B. $\frac{P}{RT}$

C. $\frac{M}{V}$

D. $\frac{PM}{RT}$

Answer: D



Watch Video Solution

39. Initial temperature of an ideal gas is $75^{\circ}C$.

At what temperature, the sample of neon gas would be heated to double its pressure, if the initial volume of gas is reduced by 15%?

A. $60^{\circ}C$

B. $128^{\circ}C$

C. $319^{\circ}C$

D. $592^{\circ}C$

Answer: C



Watch Video Solution

40. The pressure of real gas is less than the pressure of an ideal gas because of

A. increase in the number of collisions

B. finite size of the molecules

C. increase in kinetic energy

D. intermolecular forces

Answer: D



Watch Video Solution

41. The compressibility factor of a gas is defined as $z = PV / RT$. The compressibility factor of ideal gas is _____.

A. -1

B. 0

C. 1

D. infinity

Answer: C



Watch Video Solution

42. Positive deviation from ideal behaviour takes place because of

A. molecular interaction between atoms and

$$PV / nRT > 1$$

B. molecular interaction between atoms and

$$PV / nRT > 1$$

C. finite size of the atoms and

$$PV / nRT > 1$$

D. finite size of the atoms and

$$PV / nRT < 1$$

Answer: A



Watch Video Solution

43. If V_0 is the observed volume of a gas and V_i is the ideal gas, volume, then z is _____.

A. $V_0 - V_i$

B. V_0 / V_i

C. V_i / V_0

D. $V_i - V_0$

Answer: B



Watch Video Solution

44. A gas can be liquefied by _____.

A. when its inversion temperature equals the Boyle temperature.

B. under adiabatic compression

C. under pressure when it is cooled to below its critical temperature

D. under adiabatic expansion.

Answer: C



Watch Video Solution

45. If an ideal gas is expanded at constant temperature then _____.

- A. pressure increases
- B. kinetic energy increases
- C. number of collisions increases
- D. work is done by the gas.

Answer: D



Watch Video Solution

46. Which of the following statements is CORRECT for Joule Thomson effect in liquefaction of permanent gases ?

A. When a work of expansion is done at the cost of internal energy, the temperature of gas drops further.

B. When a work of expansion is done at the cost of internal energy, the temperature of gas increases further.

C. When a work of compression is done at the cost of internal energy, the temperature of gas drops further.

D. When a work of compression is done at the cost of internal energy, the temperature of gas increases further.

Answer: A



View Text Solution

47. How does Linde-Claude process to liquefy gases differ from Linde process ?

A. The condensed water is not removed.

B. The gas is forced to do additional work adiabatically

C. The gas is not passed through long copper coils

D. The gas is not allowed to expand adiabatically.

Answer: B



View Text Solution

48. The collision taking place among gas molecules depends upon

A. moles of gas

B. pressure

C. temperature

D. all of these

Answer: D



Watch Video Solution

49. Indicate which of the following statements is
CORRECT.

A. At constant temperature, the average KE
of gas molecules will be the same.

B. At constant temperature, the average KE
of gas molecules will be different

C. At constant temperature, the KE will be greater for heavier gas molecules

D. At constant temperature, the KE will be less for heavier gas molecules.

Answer: A



Watch Video Solution

50. If an ideal gas is expanded at constant temperature then _____.

A. the pressure increases

B. the kinetic energy of the molecules
remains the same

C. the kinetic energy of the molecules
decreases

D. the number of molecules of the gas
increases.

Answer: B



Watch Video Solution

51. In deriving the kinetic gas equation, use is made of the root mean square velocity of the molecules because it is

A. the average velocity of the molecules

B. the most probable velocity of the molecules

C. the square root of the average square velocity of the molecules

D. the most accurate form in which velocity can be used in these calculations

Answer: D



Watch Video Solution

52. According to kinetic theory of gases, for a diatomic molecule

A. the pressure exerted by the gas is proportional to the mean velocity of the molecules

B. the pressure exerted by the gas is proportional to the square of the mean velocity of the molecules

proportional to the root mean square
velocity of the molecules

C. the root mean square velocity is inversely
proportional to the temperature

D. the kinetic energy of the molecule is
proportional to the absolute temperature.

Answer: D



Watch Video Solution

53. The ratio of root mean square velocity of average velocity of a gas molecule at a particular temperature is

A. 1 : 1.086

B. 1.086 : 1

C. 2 : 1.086

D. 1.086 : 2

Answer: B



Watch Video Solution

54. The energy of an ideal gas depends only on its _____.

A. pressure

B. volume

C. number of moles

D. temperature

Answer: D



View Text Solution

55. If the v_{rms} is $30R^{1/2}$ at $27^\circ C$ then calculate the molar mass of gas in kilogram.

A. 1

B. 2

C. 4

D. 0.001

Answer: D



Watch Video Solution

56. For one mole of an ideal gas, increasing the temperature from $0^{\circ}C$ to $20^{\circ}C$, _____.

A. increase the average kinetic energy by two times

B. increases rms velocity by $\sqrt{2}$ times

C. increases the rms velocity by two times

D. increases both the average kinetic energy and rms velocity, but not significantly .

Answer: D



Watch Video Solution

57. In the temperature changes from $27^{\circ}C$ to $127^{\circ}C$, the relative percentage change in RMS velocity is

A. 0.0156

B. 0.0256

C. 0.155

D. 0.824

Answer: C



Watch Video Solution

58. What is kinetic energy of 1 gm of O_2 at $47^\circ C$?

A. $1.24 \times 10^2 J$

B. $2.24 \times 10^3 J$

C. $1.24 \times 10^3 J$

D. $3.24 \times 10^3 J$

Answer: A



Watch Video Solution

59. Mercury manometer can be used to determine _____.

A. density

B. vapour pressure

C. surface tension

D. viscosity

Answer: B



Watch Video Solution

60. S.I. Unit of surface tension is:

A. Nm^{-1}

B. Nm^1

C. $Kgm^{-1}s^{-1}$

D. Nm^{-2}

Answer: A



Watch Video Solution

61. Liquids rise or sink in capillaries due to _____.

A. vapour pressure

B. surface tension

C. viscosity

D. volume

Answer: B



Watch Video Solution

62. Which of the following statements is INCORRECT for liquid ?

A. Molecules in the bulk of liquid experience balanced forces and the resultant net force is zero.

B. Molecules on the surface of liquid experience repulsive forces in the downward direction.

C. The cleansing action of soaps and detergents is because of their ability to

reduce surface tension of water.

D. Liquid droplets always tend to be spherical to reduce surface tension.

Answer: B



View Text Solution

63. As the temperature rises viscosity of liquids

A. increases

B. decreases

C. remains constant

D. increases irregularly

Answer: B



Watch Video Solution

64. On atmosphere is numerically equal to approximately _____.

A. 10^6 dynes cm^{-2}

B. 10^2 dynes cm^{-2}

C. 10^4 dynes cm^{-2}

D. 10^8 dynes cm^{-2}

Answer: A



Watch Video Solution

65. Which of the following statements is FALSE ?

A. The produce of pressure and volume of fixed amount of a gas is independent of temperature

B. Molecule of different gases have the same average K.E. at a given temperature.

C. The ideal gas equation is not valid at high pressure and low temperature.

D. Minimum pressure at critical temperature when liquefaction of gas first commences is called critical pressure.

Answer: A



[View Text Solution](#)

66. Which of the following statement is CORRECT ?

A. In all the three states, the molecules possess random translational motion.

B. Gases cannot be converted into solids without passing through liquid state.

C. At a particular temperature, all molecules of a gas do not possess same velocity.

D. According to Boyle's law V/P is constant at constant T and n .

Answer: C



View Text Solution

67. Which of the following pressure conversion factors of INCORRECT?

A. 1 atmosphere = 76 cm of Hg.

B. 1 atmosphere = 760 mm of Hg.

C. 1 atmosphere = 101325 Pa

D. 1 atmosphere = 1×10^6 torr

Answer: D



Watch Video Solution

68. What is CORRECT about surface tension and viscosity of liquids ?

A. Both increase the temperature

B. Both decrease with temperature

C. Surface tension increases whereas viscosity decreases with temperature.

D. Surface tension decreases whereas viscosity increases with temperature.

Answer: B



[View Text Solution](#)

Competitive Thinking

1. Which one of the following statements is WRONG for gases ?

- A. Gases do not have a definite shape and volume.
- B. Volume of the gas is equal to the volume of the container confining the gas.
- C. Confined gas exerts uniform pressure on the walls of its container in all directions.
- D. Mass of the gas cannot be determined by weighing a container in which it is enclosed.

Answer: D



[Watch Video Solution](#)

2. Which has the highest boiling point ?

A. HF

B. HCl

C. HBr

D. HI

Answer: A



[View Text Solution](#)

3. If 20cm^3 gas at 1atm is expanded to 50cm^3 at constant T , then what is the final pressure

A. $20 \times \frac{1}{50}$

B. $50 \times \frac{1}{20}$

C. $1 \times \frac{1}{20} \times 50$

D. $50 \times \frac{1}{0.02}$

Answer: A



Watch Video Solution

4. If pressure becomes double at the same absolute temperature on $2LCO_2$, then the volume of CO_2 becomes

A. 2L

B. 4L

C. 25L

D. 1L

Answer: D



Watch Video Solution

5. Pressure remaining the same, the volume of a given mass of an ideal gas increases for every degree centigrade rise in temperature by definite fraction of its volume at

A. $0^{\circ}C$

B. its critical temperature

C. absolute zero

D. its Boyle temperature

Answer: A



Watch Video Solution

6. Select one correct statement. In the gas equation, $PV = nRT$

A. n is the number of molecules of a gas

B. V denotes volume of one mole of the gas

C. n moles of the gas have a volume V

D. P is the pressure of the gas when only one mole of gas is present

Answer: C



Watch Video Solution

7. For an ideal gas, number of moles per litre in terms of its pressure P , gas constant R and temperature T is

A. PT / R

B. PRT

C. P / RT

D. RT / P

Answer: C



Watch Video Solution

8. A gas such as carbon monoxide would be most likely to obey the ideal gas law at

A. high temperature and high pressure.

B. low temperature and low pressure

C. high temperature and low pressure

D. low temperature and high pressure.

Answer: C



Watch Video Solution

9. The density of a gas at $27^{\circ}C$ and 1atm is d .

Pressure remaining constant, at which of the following temperature will its density become $0.75d$?

A. $20^{\circ}C$

B. $30^{\circ}C$

C. 400K

D. 300K

Answer: C



Watch Video Solution

10. Under what conditions will a pure sample of an ideal gas not only exhibit a pressure of 1 atm but also a concentration of 1 mol litre^{-1}

$$[R = 0.082 \text{ litre atm mol}^{-1} \text{ K}^{-1}]$$

A. At STP

B. When $V = 22.4$ litres

C. When $T = 12\text{ K}$

D. Impossible under any conditions

Answer: C





11. The pressure exerted by $6.0g$ of methane gas in a $0.03m^3$ vessel at $129^\circ C$ is: (Atomic masses of

$C = 12.01$, $H = 1.01$ and $R = 8.314JK^{-1}mol^{-1}$)

A. 215216 Pa

B. 13409 Pa

C. 41648 Pa

D. 31648Pa

Answer: C



Watch Video Solution

12. A gas occupies a volume of 300 cm^3 at $27.^\circ \text{ C}$ and 620 mm pressure . The volume of gas at $47.^\circ \text{ C}$ and 640 mm pressure is

A. 400 c.c.

B. 510 c.c.

C. 310 c.c.

D. 350 c.c.

Answer: C



Watch Video Solution

13. A weather balloon filled with hydrogen at 1 atm and $27^{\circ}C$ has volume equal to 1200 litres.

On ascending, it reaches a place where temperature is $-23^{\circ}C$ and pressure is 0.5 atm.

The volume of the balloon is

A. 24000 litres

B. 20000 litres

C. 10000 litres

D. 12000 litres

Answer: B



Watch Video Solution

14. One litre of a gas weights 2 g at 300 K and 1 atm pressure. If the pressure is made 0.75 atm at which of the following temperature will one litre of the same gas weight one gram ?

A. 450 K

B. 600 K

C. 800 K

D. 900 K

Answer: A



Watch Video Solution

15. If the pressure and absolute temperature of 2 litres of CO_2 are doubled, the volume of CO_2 would become _____.

A. 2 litres

B. 5 litres

C. 5 litres

D. 7 litres

Answer: A



View Text Solution

16. A bubble of air is underwater at temperature $15^{\circ}C$ and the pressure 1.5 bar. If the bubble rises to the surface where the temperature is

25°C and the pressure is 1.0 bar, what will happen to the volume of the bubble?

A. Volume will become smaller by a factor of

0.70 .

B. Volume will become greater by a factor of

2.5

C. Volume will become greater by a factor of

1.6 .

D. Volume will become greater by a factor of

1.1.

Answer: C



Watch Video Solution

17. Density of carbon monoxide is maximum at

- A. 2 atm and 600 K
- B. 0.5 atm and 273 K
- C. 6 atm and 1092 K
- D. 4 atm and 500 K

Answer: D



18. For one mole of an ideal gas the slope of V versus T curve at constant pressure of 2 atm is X $\text{lit mol}^{-1} \text{K}^{-1}$. The value of the ideal universal gas constant 'R' in terms of X is _____.

A. $X \text{ lit atm mol}^{-1} \text{K}^{-1}$

B. $\frac{X}{2} \text{ lit atm mol}^{-1} \text{K}^{-1}$

C. $2X \text{ lit atm mol}^{-1} \text{K}^{-1}$

D. $2X \text{ atm lit}^{-1} \text{mol}^{-1} \text{K}^{-1}$

Answer: C



Watch Video Solution

19. When an ideal gas undergoes unrestrained expansion, no cooling occurs because the molecules

- A. are above the inversion temperature.
- B. exert no attractive force on each other
- C. does equal work with loss in kinetic energy
- D. collide without loss of energy.

Answer: B



Watch Video Solution

20. The compressibility of a gas is less than unity at *STP* .

A. $V_m > 22.4$ litres

B. $V_m < 22.4$ litres

C. $V_m = 22.4$ litres

D. $V_m > 44.8$ litres

Answer: B



Watch Video Solution

21. Dominance of strong repulsive forces among the molecules of the gas ($Z =$ compressibility factor)

- A. depends on z and indicated by $z = 1$
- B. depends on z and indicated by $z > 1$
- C. depends on z and indicated by $z < 1$
- D. is independent of z

Answer: C



Watch Video Solution

22. The compressibility factor (z) for a real gas at its Boyle temperature is _____.

A. 1

B. 0

C. > 1

D. < 1

Answer: A



Watch Video Solution

23. A gas can be liquefied at temperature T and pressure P provided _____.

A. $T = T_c$ and $P < P_c$

B. $T < T_c$ and $P > P_c$

C. $T > T_c$ and $P > P_c$

D. $T > T_c$ and $P < P_c$

Answer: B



Watch Video Solution

24. Which set of conditions represent the easiest way to cool a gas ?

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

Answer: A



Watch Video Solution

25. If u_1, u_2, u_3, \dots represent the speed of n_1, n_2, n_3, \dots molecules, then the root mean square speed is _____.

A. $\left(\frac{u_1^2 + u_2^2 + u_3^2 + \dots}{n_1 + n_2 + n_3 + \dots} \right)^{1/2}$

B. $\frac{(u_1^2 + u_2^2 + u_3^2 + \dots)^{1/2}}{n_1 + n_2 + n_3 + \dots}$

C. $\frac{(u_1^2)^{1/2}}{n_1} + \frac{(u_2^2)^{1/2}}{n_2} + \frac{(u_3^2)^{1/2}}{n_3} + \dots$

$$D. \left(\frac{(u_1 + u_2 + u_3 + \dots)^{1/2}}{(n_1 + n_2 + n_3 + \dots)} \right)^{1/2}$$

Answer: A



Watch Video Solution

26. At constant volume, for a fixed number of moles of a gas, the pressure of the gas increases with the rise in temperature due to

A. increase in the average molecular speed

B. increased rate of collision amongst molecules

C. increase in molecular attraction

D. increase in number of moles.

Answer: A



Watch Video Solution

27. The kinetic theory of gases predicts that total kinetic energy of a gaseous assembly depends on

A. pressure

B. temperature

C. volume

D. pressure, volume and temperature.

Answer: B



Watch Video Solution

28. Which of the following expressions correctly represents the relationship between the

average molar kinetic energies (KE) of CO and N_2 molecules at the same temperature?

A. $KE_{CO} = KE_{N_2}$

B. $KE_{CO} > KE_{N_2}$

C. $KE_{CO} < KE_{N_2}$

D. Cannot be predicted unless the volumes of the gases are given.

Answer: A



Watch Video Solution

29. The ratio among most probable velocity, mean velocity and root mean velocity is given by

A. $1:2:3$

B. $1:\sqrt{2}:\sqrt{3}$

C. $\sqrt{2}:\sqrt{3}:\sqrt{8/\pi}$

D. $\sqrt{2}:\sqrt{8/\pi}:\sqrt{3}$

Answer: D



Watch Video Solution

30. Root mean square velocity of a gas molecule is proportional to

A. $M^{1/2}$

B. M^0

C. $M^{-1/2}$

D. M

Answer: C



Watch Video Solution

31. Which one of the following statement is not true about the effect of an increase in temperature on the distribution of molecular speed of gas ? .

A. The most probable speed increases.

B. The fraction of the molecules with the most probable speed increases.

C. The distribution becomes broader

D. The area under the distribution curve remains the same as under the lower

temperature.

Answer: B



Watch Video Solution

32. By what factor does the average velocity of a gaseous molecule increase when the temperature (in Kelvin) is doubled?

A. 1.4

B. 2.0

C. 2.8

D. 4.0

Answer: A



Watch Video Solution

33. At what temperature is the average velocity of O_2 molecule equal to the root mean square velocity at $27^\circ C$?

A. $80.47^\circ C$

B. $80^\circ C$

C. $83^\circ C$

D. $86.5^{\circ}C$

Answer: A



Watch Video Solution

34. The temperature of the gas is raised from $27^{\circ}C$ to $927^{\circ}C$, the root mean square velocity is

A. $\sqrt{927/27}$ times the earlier value

B. same as before

C. halved

D. doubled

Answer: D



Watch Video Solution

35. The rms velocity of CO gas molecules at 27°C is approximately 1000 m/s . For N_2 molecules at 600 K , the rms velocity is approximately " "

A. 2000m/s

B. 1414m/s

C. $1000m / s$

D. $1500m / s$

Answer: B



Watch Video Solution

36. The ratio between the root mean square speed of H_2 at $50K$ and that of O_2 at $800K$ is

A. 4

B. 2

C. 1

D. $\frac{1}{4}$

Answer: C



Watch Video Solution

37. The root mean square velocity of one mole of a monoatomic gas having molar mass M is $U_{r.m.s.}$. The relation between the average kinetic energy (E) of the gas and U_{rms} is

A. $U_{rms} = \sqrt{\frac{3E}{2M}}$

$$\text{B. } U_{\text{rms}} = \sqrt{\frac{2E}{3M}}$$

$$\text{C. } U_{\text{rms}} = \sqrt{\frac{2E}{M}}$$

$$\text{D. } U_{\text{rms}} = \sqrt{\frac{E}{3M}}$$

Answer: C



Watch Video Solution

38. The molecular velocities of two gases at same temperature are u_1 and u_2 , their masses are m_1 and m_2 respectively, which of the following expression is correct ?

A. $\frac{m_1}{u_1^2} = \frac{m_2}{u_2^2}$

B. $m_1 u_1 = m_2 u_2$

C. $\frac{m_1}{u_1} = \frac{m_2}{u_2}$

D. $m_1 u_1^2 = m_2 u_2^2$

Answer: D



Watch Video Solution

39. The average kinetic energy of an ideal gas per molecule in SI units at $25^\circ C$ will be

A. $6.17 \times 10^{-21} \text{ kJ}$

B. $6.17 \times 10^{-21} \text{ J}$

C. $6.17 \times 10^{-20} \text{ J}$

D. $6.17 \times 10^{-20} \text{ J}$

Answer: B



Watch Video Solution

40. As the temperature is raised from 20°C to 40°C the average kinetic energy of neon atoms changes by a factor .

A. $\frac{313}{293}$

B. $\sqrt{\frac{313}{293}}$

C. $\frac{1}{2}$

D. 2

Answer: A



Watch Video Solution

41. Which of the following exhibits the weakest intermolecular forces?

A. NH_3

B. HCl

C. He

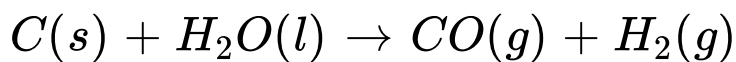
D. H_2O

Answer: C



Watch Video Solution

42. Given the reaction :



Calculate the volume of the gases produced at STP from 48.0 g of carbon.

A. 179.2L

B. 89.6 L

C. 44.8 L

D. 22.4 L

Answer: A



[Watch Video Solution](#)

43. Absolute zero is defined as the temperature

A. at which all molecular motion ceases

B. at which liquid helium boils

C. at which ether boils

D. all of the above

Answer: A



Watch Video Solution

44. An ideal gas obeying kinetic theory of gases

_____.

A. can be liquefied if its temperature is more than critical temperature T_c .

B. can be liquefied if its pressure is more than critical pressure P_c .

C. can be liquefied if its pressure is more than P_c at a temperature less than T_c .

D. cannot be liquefied at any value of P and T.

Answer: D



Watch Video Solution

45. A,B,C and D are four different gases with critical temperatures 304.1, 154.3 , 405.5 and 126.0 K respectively. While cooling, the gas which gets liquefied first is _____.

A. B

B. A

C. D

D. C

Answer: D



Watch Video Solution

46. The gas that liquefies first, when cooled from 500 K to its critical temperature given in parenthesis is _____.

A. $NH_3(405.5K)$

B. $CO_2(304.1K)$

C. $N_2(126.0K)$

D. $O_2(154.3K)$

Answer: A



Watch Video Solution

47. Which is not true in case of an ideal gas?

A. It cannot be converted into a liquid.

B. There is no interaction between the molecules.

C. All molecules of the gas move with same speed.

D. At a given temperature, PV is proportional to the amount of the gas.

Answer: C





Watch Video Solution

48. At STP , 0.50 mole H_2 gas and 1.0mole He gas

- A. have equal average kinetic energies
- B. have equal molecular speeds
- C. occupy equal volumes
- D. have equal effusion rates

Answer: A



Watch Video Solution

49. The units of surface tension and viscosity of liquids are respectively _____.

A. $kgm^{-1}s^{-1}$, Nm^{-1}

B. $kg s^{-2}$, $kgm^{-1}s^{-1}$

C. Nm^{-1} , $kgm^{-1}s^{-2}$

D. $kg s^{-1}$, $kgm^{-2}s^{-1}$

Answer: B



Watch Video Solution

50. Which one of the following statements is NOT CORRECT ?

A. For ideal gases, compressibility factor, $z = 1$ at all temperatures and pressures.

B. Viscosity of a liquid decreases with increasing temperature.

C. The order of root mean square velocity

(U_{rms}) , average velocity (U_{av}) and most

probable velocity (U_{mp}) of a gas is

$$(U_{rms}) > (U_{av}) > (U_{mp})$$

D. The kinetic energy of a gas is inversely proportional to temperature (in K).

Answer: D



Watch Video Solution

Evaluation Test

1. At constant temperature and pressure which of the following gases will diffuse first ?

A. H_2

B. O_2

C. N_2

D. Ne

Answer: a



Watch Video Solution

2. At 1 atm and 273 K the density of gas, whose molecular weight is 45, is:

A. 44.8 gm /litre

B. 11.4 gm / litre

C. 2 gm / litre

D. 3 gm / litre

Answer: c



Watch Video Solution

3. For a closed system consisting of a reaction

$N_2O_{4(g)} \rightarrow 2NO_{2(g)}$, the pressure

_____.

A. remains constant

B. decreases

C. increases

D. becomes zero.

Answer: c



Watch Video Solution

4. Three different gases X, Y and Z of molecular masses 2, 16 and 64 were enclosed in a vessel at constant temperature till equilibrium is reached. Which of the following statement is correct?

A. Gas Z will be at the top of the vessel.

B. Gas Z will be at the bottom and X will be at the top.

C. Gas X will be at the bottom and Z will be at the top.

D. Gases will form homogeneous mixture.

Answer: d



Watch Video Solution

5. At a constant pressure, the density of a certain amount of an ideal gas is _____.

- A. directly proportional to the temperature
- B. inversely proportional to the temperature
- C. directly proportional to the square of the temperature.
- D. independent of a temperature

Answer: b



Watch Video Solution

6. What mass of an oxygen gas will occupy 8.21 L of volume at 1 atm pressure and 200 K temperature ?

A. 16g

B. 8 g

C. 20 g

D. 12 g

Answer: a



Watch Video Solution

7. At what temperature, the r.m.s. velocity of a gas measured at $50^{\circ} C$ will become double ?

A. 626 K

B. 1019K

C. $200^{\circ} C$

D. $1019^{\circ} C$

Answer: d



Watch Video Solution

8. At $25^{\circ}C$ and 1 atm, a vessel contains 20 L of an ideal gas. If the volume of vessel increased to 40 L, the pressure exerted by gas in vessel will be _____.

A. 2 atm

B. 1 atm

C. 1.5 atm

D. 0.5 atm

Answer: d



Watch Video Solution

9. Which set of conditions represents easiest way to liquefy a gas ?

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

Answer: a



View Text Solution

10. Volume of the air that will be expelled from a vessel of 300cm^3 when it is heated from 27°C to 37°C at the same pressure will be

A. 310cm^3

B. 290cm^3

C. 10cm^3

D. 37cm^3

Answer: c



Watch Video Solution

11. At what temperature do the average speed of $CH_4(g)$ molecules equal the average speed of O_2 molecules at 300 K ?

A. 1200K

B. 150 K

C. 600 K

D. 300 K

Answer: b



Watch Video Solution

12. A bubble of gas released at the bottom of a lake increases to four times its original volume when it reaches the surface. Assuming that atmospheric pressure is equivalent to the pressure exerted by a column of water 10 m high, what is the depth of the lake?

A. 90m

B. 40 m

C. 10 m

D. 70 m

Answer: d



Watch Video Solution

13. At a constant volume, a quantity of an ideal gas has a pressure of 800 mm Hg at 300 K. At what pressure, the temperature will be halved ?

A. 1400 mm Hg

B. 1000 mm Hg

C. 250 mmHg

D. 400 mm Hg

Answer: d



Watch Video Solution

14. At critical point, the surface tension is

_____.

A. infinite

B. zero

C. same as that at room temperature

D. twice as that at room temperature

Answer: b



View Text Solution

15. Vapour pressure of a liquid depends upon its

A. the amount of the liquid taken

B. the amount as well as temperature

C. the nature of the liquid and the
temperature

D. the surface area of the liquid.

Answer: c



Watch Video Solution

16. The boiling point of inert gases increases with the increase in atomic number because _____.

- A. there is absence of intermolecular force of attraction between the molecules
- B. dispersion forces increase with the mass of the molecule

C. viscosity decreases with increase in mass
of the molecular

D. ionisation energy decreases with increase
in atomic number.

Answer: b



Watch Video Solution

17. Each gas exhibit _____ deviation
from ideal behaviour.

A. positive

B. negative

C. both positive and negative

D. either positive or negative

Answer: c



Watch Video Solution

18. Which of the following statements is INCORRECT for a real gas ?

A. At Boyle temperature, compressibility

factor, $z = 1$

B. Above Boyle temperature, compressibility

factor, $z > 1$

C. Below Boyle temperature, compressibility

factor, $z < 1$

D. Real gas follows ideal gas equation below

Boyle temperature.

Answer: d



Watch Video Solution

19. Many real gases behave as ideal gases at _____.

A. 0 K and 1 atm

B. 0°C and 1 atm

C. 1K and 1 atm

D. 298 K and 10 atm

Answer: b



Watch Video Solution

20. What is the relationship between the average velocity (v), root mean square velocity (u) and most probable velocity

A. $\alpha : v : u :: 1 : 1.128 : 1.224$

B. $\alpha : v : u :: 1.128 : 1 : 1.224$

C. $\alpha : v : u :: 1.128 : 1.224 : 1$

D. $\alpha : v : u :: 1.124 : 1.228 : 1$

Answer: a



Watch Video Solution