# CHEMISTRY

## AAKASH INSTITUTE ENGLISH

## MOCK TEST 8

**Example**

**1.** At room temperature $F_2$ and $Cl_2$ are gases $Br_2$ is a liquid and $I_2$ is solid. This is because

A. Dipole-induced dipole interaction increases with molecular size

B. Dipole-dipole interactions increases with molecular size

C. Dispersion (London) interaction increases with molecular size

D. Dispersion ( London) interactions decreases with molecular size and polarity increases with molecular size

**Answer: C**

Watch Video Solution

**2.** One of the reasons that solid $CuSO_4$ dissolves in water is

A. The ion-dipole forces between the ions and water molecules

B. The electrostatic force of attraction between $Cu^{2+}$ and the $SO_4^{2-}$ ions

C. Instantaneous dipole-induced dipole forces (dispersion or London forces) between the $Cu^{2+}$ and $SO_4^{2-}$ ions

D. The hydrogen bonding between the water molecules

**Answer: A**

Watch Video Solution

**3.** The intermolecular interaction that is dependent on the inverse cube of distance between the molecule is :

A. Ion-ion interaction

B. Ion-dipole interaction

C. London forces

D. Dipole-dipole forces

**Answer: D**

Watch Video Solution

**4.** Which of the following is true about gaseous state of matter?

A. Thermal energy is equal to molecular force of attraction

B. Molecular forces of attraction are higher in gases than those in liquids

C. Thermal energy is lower than molecular forces of attraction

D. Thermal energy is highly greater than molecular forces of attraction

**Answer: D**

Watch Video Solution

**5.** The boiling point of water ,ethyl alcohol and diethyl ether are $100^{o}C$ , $78.5^{o}C$ and $34.6^{o}C$ respectively. Intermolecular forces will be in order of

A. Water gt Ethyl alcohol gt Diethyl ether

B. Ethyl alcohol gt Water gt Diethyl ether

C. Diethyl ether gt Ethyl alcohol gt Water

D. Diethyl ether gt Water gt Ethyl alcohol

**Answer: A**

Watch Video Solution

**6.** Among the following order of energies of molecular orbitals of $O_2$ choose the correct one

A. $E(\pi 2p_x) = E(\pi 2p_y) < E(\sigma 2p_z) < (E\pi^* 2p_x) = E(\pi^* 2 \pm p_y)$

B. $E(\pi 2p_x) = E(\pi 2p_y) > E(\sigma 2p_z) > (E\pi^* 2p_x) = E(\pi^* 2p_y)$

C. $E(\pi 2p_x) = E(\pi 2p_y) < E(\sigma 2p_z) > (E\pi^* 2p_x) = E(\pi^* 2p_y)$

D. $E(\pi 2p_x) = E(\pi 2p_y) > E(\sigma 2p_z) < (E\pi^* 2p_x) = E(\pi^* 2p_y)$

**Answer: D**

Watch Video Solution

**7.** Which of the following statements is not correct from the viewpoint of molecular orbital theory?

A. $Be_2$ is not a stable molecule

B. $He_2$ is not stable but $He_2^+$ is expected to exist

C. Bond strength of $N_2$ is maximum amongst the homonuclear diatomic molecules

D. The order of energies of molecular orbitals in $F_2$ molecule is

$$E(\sigma 2s) < E(\sigma^* 2s) < E(2\pi p_x) = E\left(\pi 2p_y\right) < E(\sigma 2p_z) < E(\pi^* 2p_x)$$

**Answer: D**

Watch Video Solution

**8.** Among the following the paramagnetic compound is

A. $Na_2O_2$

B. $O_3$

C. $N_2O$

D. $KO_2$

**Answer: D**

Watch Video Solution

**9.** The molecular electronic configuration of $B_2$ is

A. $KK(\sigma 2s)^2(\sigma^* 2s)^2\left(\pi 2p_x^1 = \pi 2p_y^1\right)$

B. $KK(\sigma 2s)^2(\sigma^* 2s)^2(\pi 2p_x)^2$

C. $KK(\sigma 2s)^2(\sigma^* 2s)^2(\sigma 2p)^2$

D. $KK(\sigma 2s)^2(\sigma^* 2s)^2(\sigma 2p)^1(\pi 2p)^1$

**Answer: A**

Watch Video Solution

**10.** Among the following molecular orbitals how many have at least one nodal plane? $\sigma^* 1s, \sigma 2s, \sigma^* 2p_z, \pi 2p_x, \pi^* 2p_y, \sigma 2p_z$

A. 4

B. 5

C. 2

D. 6

**Answer: B**

Watch Video Solution

**11.** The order of strength of hydrogen bonds is

A. $H_2N - H\cdots NH_3 > HO - H\cdots OH_2 > F - H\cdots F - H$

B. $H_2N - H\cdots NH_3 < HO - H\cdots OH_2 < F - H\cdots F - H$

C. $H_2N - H\cdots NH_3 > F - H\cdots F - H > HO - H\cdots OH_2$

D. $H_2N - H\cdots NH_3 < HO - H\cdots OH_2 > F - H\cdots F - H$

**Answer: B**

Watch Video Solution

**12.** o-nitrophenol is more volatile than p-nitrophenol it is due to

A. Intermolecular hydrogen bonding in o- nitrophenol

B. Intramolecular hydrogen bonding in o- nitrophenol

C. Intramolecular hydrogen bonding in p-nitrophenol

D. More resonating structure of p-nitrophenol

**Answer: B**

Watch Video Solution

**13.** In which of the following ionisation processes, the bond order has increased and the magnetic behaviour has changed?

A. $C_2 \rightarrow C_2^+$

B. $NO \rightarrow NO^+$

C. $O_2 \rightarrow O_2^+$

D. $N_2 \rightarrow N_2^+$

**Answer: B**

Watch Video Solution

**14.** Which of the following species has shortest Bond length?

A. $N_2^+$

B. $N_2$

C. $N_2^-$

D. $N_2^{2-}$

**Answer: B**

Watch Video Solution

**15.** Out of the following bond order of oxygen species identify the correct answer

A. $O_2^- > O_2 > O_2^+$

B. $O_2^- < O_2 < O_2^+$

C. $O_2^- > O_2 < O_2^+$

D. $O_2^- < O_2 > O_2^+$

**Answer: B**

Watch Video Solution

**16.** Which of the following curve does not represent Boyle's law?

A. 

B. 

C. 

D. 

**Answer: D**

Watch Video Solution

**17.** If the pressure of a gas contained in a closed vessel is increased by 0.4 % when heated by $1^{o}C$ then its initial temperature must be

A. 250 K

B. $250^{o}C$

C. $25^{o}C$

D. 25 K

**Answer: A**

Watch Video Solution

**18.** An open flask contains air at $27^{o}C$.To what temperature it must be heated to expel one-fourth of the air?

A. $127^{o}C$

B. $65^{o}C$

C. $927^{o}C$

D. 460°C

**Answer: A**

Watch Video Solution

**19.** The temperature, at which the volume of a given gas at 25°C becomes thrice when pressure of the system is kept constant

A. 75°C

B. 894 K

C. 440°C

D. 350 K

**Answer: B**

Watch Video Solution

**20.** Equal volumes of all gases under similar conditions of temperature and pressure contain equal number of atoms.

A. Moles

B. Atoms

C. Electrons

D. Radicals

**Answer: A**

Watch Video Solution

**21.** V vs T curves at constant pressure $P_1$ and $P_2$ for an ideal gas are shown in the figure. Which of the following is correct?

A. $P_1 > P_2$

B. $P_1 < P_2$

C. $P_1 = P_2$

D. $P_1$ and $P_2$ cannot be related

**Answer: A**

Watch Video Solution

**22.** One gram mole of a gas at STP occupies 22.4 L. This fact is derived from

A. Avogadro's law

B. Charles law

C. Dalton's law

D. Boyle's law

**Answer: A**

Watch Video Solution