

CHEMISTRY 2021

(AS PER CONDENSED SYLLABUS)

TIME: 2 Hours

(85 Marks)

NOTE:

i) This section consists of 43 part questions and all are to be answered. Each question carries ONE marks.

ii) Do not copy the part questions in your answer book. Write only the answer in full against the proper number of the question and its part.

SECTION 'A' (Multiple Choice Questions)(43)

1. Choose the correct answer for each from the given options:

(i) The volume of 3.01×10^{23} molecules of H_2 at S.T.P will be:

- * $11.2 dm^3$ ✓ * $22.4 dm^3$ * $33.6 dm^3$ * $44.8 dm^3$

(ii) 602.10 has:

- * 3 significant figures * 4 significant figures
* **5 significant figures** ✓ * 6 significant figures

(iii) One mole of H_2O contains number of hydrogen atoms:

- * 6.02×10^{23} * **1.204×10^{24}** ✓
* 3.01×10^{23} * 1.204×10^{23}

(iv) The phenomenon is due to surface tension:

- * Density * Vapour Pressure
* Viscosity * **Capillary Action** ✓

(v) The rate of diffusion of CO_2 is equal to:

- * CO * CH_4 * **C_2H_6** ✓ * SO_2

(vi) This law is applied in collection of gases over water:

- * Graham's Law of Diffusion
* **Dalton's Law of Partial Pressure** ✓

* Avogadro's law

* Charle's law

(vii) Volume-volume relationship is based on:

- * Avogadro's Law * **Gay-Lussac's Law** ✓
* Dalton's Law * Boyle's Law

(viii) In James Chadwick's experiment α - particles were bombarded on:

- * **Beryllium** ✓ * Boron * Bromine * Carbon

(ix) This colour has the largest wavelength in the visible spectrum:

- * **Red** ✓ * Violet * Blue * Green

(x) The maximum number of electrons in a particular sub-energy level is:

- * n^2 * $2n^2$ * $2l + 1$ * **$2(2l + 1)$** ✓

(xi) In they hydrogen atom spectrum, the series of line obtained when electron jumps from higher orbits to the first orbit, is called:

- * **Lyman Series** ✓ * Balmer Series

* Paschen Series

* Brackett Series

(xii) By emitting α - particle, ${}_{92}U^{238}$ converts into:

- * ${}_{82}Pb^{208}$ * ${}_{84}Po^{210}$ * ${}_{89}Ac^{227}$ * ${}_{90}Th^{234}$ ✓

(xiii) The range of bond energy of hydrogen bond is:

- * $10 - 20$ kJ/mole * **$20 - 40$ kJ/mole** ✓
* $40 - 50$ kJ/mole * $50 - 60$ kJ/mole

(xiv) 1 Debye is equal to:

- * **3.335×10^{-30} Cm** ✓ * 6.02×10^{-23} Cm
* 9.11×10^{-27} Cm * 1.602×10^{-19} Cm

(xv) This molecule has the highest bond energy but the shortest bond length:

- * $C = C$ * $C \equiv C$ * $O = O$ * **$N \equiv N$** ✓

(xvi) This molecule has zero dipole moment:

- * NO_2 * **CO_2** ✓ * SO_2 * H_2O

(xvii) The octet rule is not applied on this molecule:

- * N_2 * F_2 * O_2 * **H_2** ✓

(xviii) This molecule has linear structure:

- * CH_4 * NH_3 * BF_3 * **C_2H_2** ✓

(xix) The number of bonds in ethyne (C_2H_2) is:

- * **Two Sigma, Two Pi** ✓ * Three Sigma, Three Pi
* Three Sigma, Two Pi * Two Sigma, Three Pi

(xx) This is not an intensive property:

- * **Volume** ✓ * Surface Tension * Viscosity * Boiling Point

(xxi) At constant volume heat absorbed by a system is:

- * $q_r = \Delta E$ ✓ * $q_p = \Delta H$
* $q = E + PV$ * $w = P\Delta V$

(xxii) In this reaction $K_p > K_c$ is:

- * $N_2 + 3H_2 \rightleftharpoons 2NH_3$ * **$PCl_5 \rightleftharpoons PCl_3 + Cl_2$** ✓
* $2NO_2 \rightleftharpoons N_2O_4$ * $2SO_2 + O_2 \rightleftharpoons 2SO_3$

(xxiii) In an exothermic reaction, increase of temperature favours:

- * Forward direction * **Reverse direction** ✓
* Remain at Equilibrium * Irreversible

(xxiv) The reaction

$CH_3COOH + C_2H_5OH \rightleftharpoons CH_3COOC_2H_5 + H_2O$ is called:

- * Neutralization * Hydrolysis
* **Esterification** ✓ * Electrolysis

(xxv) According to principle of Le-Chatlier the yield of the products cannot be controlled with the help of:

* concentration

* pressure

* catalyst ✓

* temperature

(xxvi) When this salt is dissolved in water it does not hydrolyse:

- * **$NaCl$** ✓ * CH_3COONa * Na_2CO_3 * $NaHCO_3$

(xxvii) This cation has the greatest tendency to get hydrated:

- * Na^+ * Mg^{2+} * **Al^{3+}** ✓ * K^+

(xxviii) Its solution is basic:

- * NH_4Cl * $NaCl$ * **Na_2CO_3** ✓ * KCl

(xxix) The oxidation number of N in HNO_3 is:

- * +2 * +3 * **+5** ✓ * +7

(xxx) This is considered as weak electrolyte:

- * HCl * HNO_3 * $NaOH$ * **CH_3COOH** ✓

(xxxi) The order of photo chemical reaction is:

- * **zero** ✓ * first * second * third

(xxxii) A powdered zinc is more reactive than a chunk of zinc due to:

- * Higher Temperature * Greater Volume
* **Greater Surface Area** ✓ * Higher Pressure

(xxxiii) This compound does not contain hydrogen bond:

- * **CH_4** ✓ * H_2O * NH_3 * HF

(xxxiv) Motor Oil grading is based on:

- * Surface Tension * **Viscosity** ✓
* Vapour Pressure * Boiling Point

(xxxv) The colour of universal indicator in neutral solution is:

- * Red * Blue * Pink * **Green** ✓

(xxxvi) Two solid compounds having the same crystal structure are called:

- * Allotropes * **Isomorphous** ✓
* Polymorphous * Isotopes

(xxxvii) This particle having mass 1836 times that of electron is:

- * **Proton** ✓ * Neutron * Meson * Hyperon

(xxxviii) This particle having mass 1836 times that of electron is:

- * **760 torr** ✓ * 700 torr * 720 torr * 760 atm

(xxxix) This one is not same in Na^+ ($Z = 11$), Mg^{2+} ($Z = 12$) and Al^{3+} ($Z = 13$):

- * number of shells * number of electrons
* electronic configuration * **number of protons** ✓

(xl) The $(n + l)$ value for 4f orbital is:

- * 4 * 5 * 6 * **7** ✓

(xli) This pair of compound has the same empirical formula:

- * C_2H_4 and C_2H_2 * CH_4 and C_2H_6
* **$HCHO$ and CH_3COOH** ✓ * C_2H_6 and C_2H_6

(xlii) This molecule have two lone pair and two bond pair electrons:

- * NH_3 * CCl_4 * **H_2O** ✓ * $BeCl_2$

(xliii) The change of concentration per unit time is called the:

- * **rate of reaction** ✓ * order of reaction
* rate constant * equilibrium constant