Std. - 11 (Semester-2)
Chemistry (052) (E)
Sample Question Paper

Time : 3 Hrs. Total Marks : 100

Instructions :

(1) There are total 59 questions in this question paper and all are compulsory.

(2) Student can use log-table or simple calculator for calculations.

(3) Give necessary figure formula and equation if required.

(4) All necessary steps in numericals and in derivation of formula must be given.

(5) Different parts of the same question should be attempted at one place.

(6) Some constants are given as follows R = 4.184 $JK^{-1}mol^{-1}$, N_A=6.022 x $10^{23}mol^{-1}$

SECTION - A

- **Select only one Correct option of the following multiple choice questions. (Each of 1 mark)** [16]

(1) In OF_2 molecule, the number of bonding electron pairs and non-bonding electron pairs are respectively.

(A) 2 and 2 (B) 2 and 4 (C) 2 and 0 (D) 2 and 8

(2) Which of the following mixture is not applicable to Dalton's law of partial pressure at a given temperature ?

(A) He + CH_4 + N_2 (B) O_2 + N_2 + Ar

(C) NH_3 + HCl + HBr (D) N_2 + H_2 + O_2

(3) Which of the following relationship is correct at equilibrium for partial pressure of H_2 (g) for the given reaction ?

$$C_{(s)} + H_2O_{(g)} \rightleftharpoons CO_{(g)} + H_{2(g)}$$

(A) $p_{H2} \alpha \frac{(P_{H_2O})^2}{(P_{CO})^1/_2}$ (B) $p_{H2} \alpha P_{H_2O}$

(C) $p_{H2} \alpha \frac{P_{CO}}{P_{H_2O}}$ (D) $p_{H2} \alpha (P_{H_2O})^{1/2}$

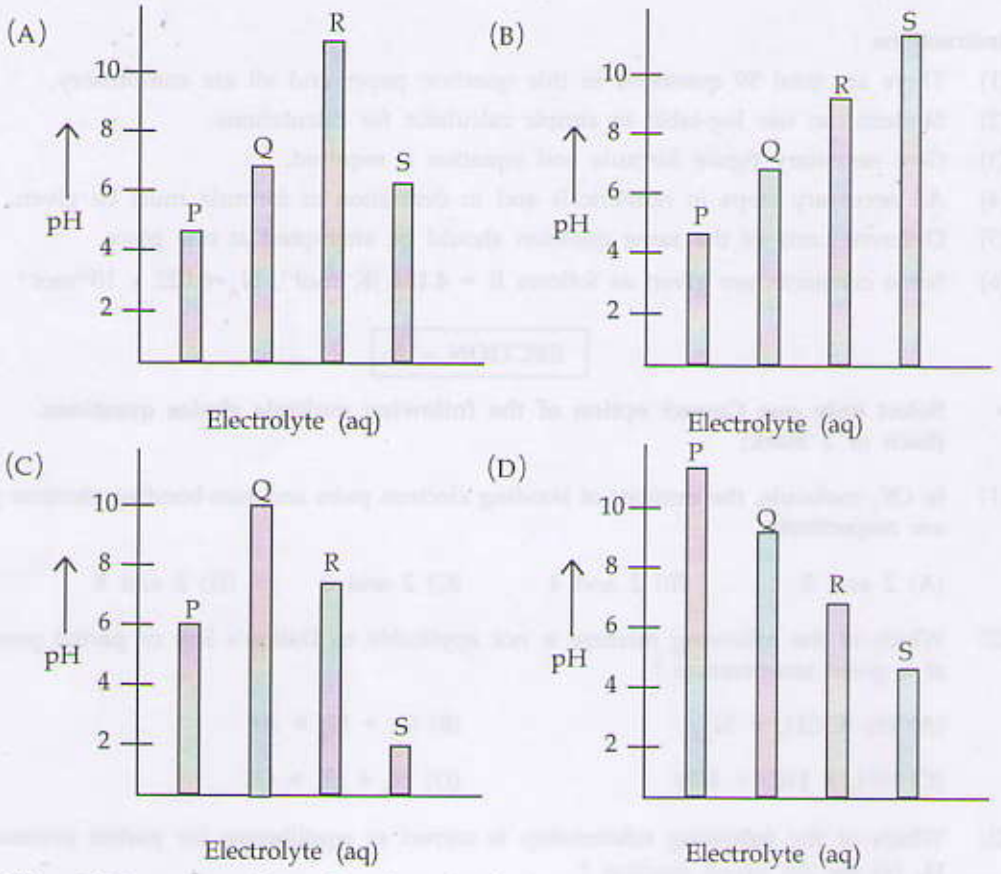
(4) The correct order of ionization enthalpy of gr-13 elements is :

(A) B > Al > Ga > In > Tl (B) B > Ga > Al > In > Tl

(C) B > Tl > Ga > Al > In (D) B > Tl > Ga > In > Al

(5) Which of the following graphs correctly represents the pH values of aqueous solutions of given electrolytes.

Electrolytes : P = $NH_4Cl_{(aq)}$ Q = $CH_3COONa_{(aq)}$
R = $KNO_{3(aq)}$ S = $H_2SO_{4(aq)}$



(6) When O_2^{1-} is converted into O_2, then which changes of the following is not associated ?

(A) One electron gets removed from π^*MO.
(B) Its bond order changes from 1.5 to 2.0.
(C) Its bond dissociation energy increases.
(D) Its magnetic property changes from paramagnetic to diamagnetic.

(7) C_nH_{2n-2} formula is applicable to :

(A) Only alkyne (B) Only cycloalkene
(C) Only alkadiene (D) All given here

(8) If the volume of ideal gas of fixed quantity is halved and temperature in kelvin is doubled, then the pressure of this gas will be :

(A) Doubled (B) Increases 4 times.
(C) Decreases to 1/4 (D) Remains the same

(9) At a given temperature and in a closed vessel, following equilibrium are established simultaneously.

$PCl_{5(g)} \rightleftharpoons PCl_{3(g)} + Cl_{2(g)}$

$COCl_{2(g)} \rightleftharpoons CO_{(g)} + Cl_{2(g)}$

If some amount CO-gas is added to this system, then in new equilibrium state, the concentration of :

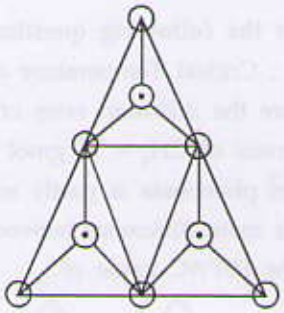
(A) PCl_5 will decrease and $COCl_2$ will increase.

(B) PCl_5 will increase and $COCl_2$ will decrease.

(C) PCl_5 and $COCl_2$ both will increase.

(D) PCl_5 and $COCl_2$ both will decrease.

(10) Which is true about this silicate structure ?



(A) It contains $Si_3O_{12}^{6-}$ silicate ion.

(B) It has three O-atoms out of plane and six O-atoms in the same plane.

(C) It has three O-atoms shared with other neighbouring tetrahedra per SiO_4 unit.

(D) It is found in diopside silicate mineral.

(11) An alkane-hydrocarbon has molecular mass 72 g-mol^{-1}. Thus, its number of possible isomers are :

(A) 2 (B) 3 (C) 4 (D) 5

(12) Identify the following products X, Y, and Z respectively in following reactions.

(i) $CaCO_{3(s)} \xrightarrow{\Delta} X_{(s)} + CO_{2(g)}$

(ii) $X_{(s)}$ + carbon $\xrightarrow{\Delta} Y_{(s)} + CO_{(g)}$

(ii) $Y_{(s)}$ + water $\longrightarrow Ca(OH)_2 + Z_{(g)}$

(A) CaO, $Ca(OH)_2$, CaC_2 (B) CaO, CaC_2, C_2H_4

(C) CaO, CaC_2, C_2H_2 (D) CaO, CaC_2, CH_4

(13) For Benzene, on its complete reduction with H_2 in presence of Ni-catalyst, which of the following is true ?

(A) It produces cyclohexane with absorption of 358.9 kJmol^{-1} of heat energy.

(B) It produces n-hexane along with liberation of 150.63 kJmol^{-1}of heat energy.

(C) It produces cyclo hexane along with the evolution of 358.9 kJmol^{-1} of heat energy.

(D) It produces cyclo hexane along with evolution of 208.36 kJmol^{-1} of heat energy.

(14) For which of the following gases, the contribution of green house gas and its % is not matched correctly ?

(A) $CO_2 \rightarrow 50\%$ (B) $CH_4 \rightarrow 19\%$ (C) CFC $\rightarrow 17\%$ (D) $N_2O \rightarrow 20\%$

(15) The drop of liquid is spherical. It is due to its :

(A) Surface Tension (B) Viscosity

(C) Vapour Pressure (D) All of these

(16) Which of the following statement is true ?

(A) Beryl is silicate type ore of Al and it contains $Si_4O_{12}^{8-}$ silicate ion.

(B) In dimeric structure of aluminium chloride, each Al is bonded to three Cl-atoms directly.

(C) B and C elements are non-metals while Tl And Pb are metallic in nature.

(D) In gr-13, Boron can form only octa hedral complexes while Al, Ga, In and Tl can not form only tetrahedral complexes.

SECTION - B

• **Answer the following questions in very short. (Each of 1 mark)** [16]

(17) Define : Critical Temperature of Gas

(18) Compare the diffusion rates of CH_4 and SO_2 gases under similar conditions (Mol. mass of CH_4 = 16 $gmol^{-1}$ and SO_2 = 64 g mol^{-1}).

(19) Calcium phosphate is partly soluble in water but becomes soluble in HCl. Why ?

(20) What is main difference between the terms dissociation and Ionisation of electrolyte ?

(21) Give the IUPAC name of :

(22) What is called Secondary Carbon ? Give its illustration.

(23) Draw the structure of diborane.

(24) Write chemical reaction to obtain lithium aluminium hydride.

(25) Give any two uses of tungston carbide.

(26) Give structural formula of the compound :

4 - Ethyl - 2, 6 - Dimethyl Oct - 4 - ene

OR

Two electronic Lewis Structures of Benzene.

(27) Give chemical reaction showing acidic nature of ethyne.

(28) Give structural formula, one of cyclic and one of acylic of hydrocarbon having molecular formula C_6H_{12} with their names.

(29) Which products are obtained by destructive distillation of mineral coal ?

(30) Give the chemical reaction to convert sodium propanoate into ethane.

(31) Write full forms of BOD, BIS

OR

Give structure of 1, 2 - Benzpyrene.

(32) Define : Acid rain