DGK

PAPER CODE - 6485

(11th CLASS – 12018) 30/5 30

CHEMISTRY (NEW COURSE)
GROUP FIRST
ACADEMIC SESSION : 2015 – 2017 TO 2017 – 2019

TIME: 20 MINUTES
MARKS: 17

OBJECTIVE

NOTE: You have four choices for each objective type question as A , B , C and D . The choice which you think is correct , fill that circle in front of that question number. Use marker or pen to fill the circles. Cutting or filling two or more circles will result in zero mark in that question.

QUESTION NO. 1

1 Which of the hydrogen halides has the highest percentage of ionic character ?
(A) HCl (B) HBr (C) HF (D) HI

2 Quantum number values for 2p orbitals are
(A) $n=2$, $\ell=1$ (B) $n=1$, $\ell=2$ (C) $n=1$, $\ell=0$ (D) $n=2$, $\ell=0$

3 Splitting of spectral lines when atoms are subjected to strong electric field is called
(A) Zeeman effect (B) Stark effect (C) Compton effect (D) Photoelectric effect

4 Geometry of SO_2 molecule is
(A) Linear (B) Angular (C) Tetrahedral (D) Trigonal pyramidal

5 For the reaction : $NaOH + HCl \longrightarrow NaCl + H_2O$, the change in enthalpy is called
(A) Heat of reaction (B) Heat of formation (C) Heat of neutralization (D) Heat of combustion

6 The solubility product of AgCl is 2.0×10^{-10} $mol^2\ dm^{-6}$ .The maximum concentration of Ag^+ ions in the solution is
(A) 2.0×10^{-10} mol dm^{-3} (B) 1.41×10^{-5} mol dm^{-3}
(C) 1.0×10^{-10} mol dm^{-3} (D) 4.0×10^{-20} mol dm^{-3}

7 The values of Kw of water at 25 °C is
(A) 0.11×10^{-14} (B) 0.30×10^{-14} (C) 1.0×10^{-14} (D) 7.5×10^{-14}

8 Which one of the following salt dissolves in water to form a solution with a pH greater than 7 ?
(A) Na Cl (B) Cu SO_4 (C) Na_2CO_3 (D) NH_4Cl

9 18 g of glucose is dissolved in 90 g of water .The relative lowering of vapour pressure is equal to
(A) $\frac{1}{5}$ (B) 5.1 (C) $\frac{1}{51}$ (D) 6

10 Stronger the oxidizing agent , greater is the
(A) Oxidation potential (B) Reduction potential (C) Redox potential (D) E.M.F. of cell

11 If the rate equation of a reaction $2A + B \longrightarrow$ products is , rate = $k[A]^2[B]$, and A is present in large excess , then order of reaction is
(A) 1 (B) 2 (C) 3 (D) Zero

12 The volume occupied by 1.4 g of N_2 at STP is
(A) 2.24 dm^3 (B) 22.4 dm^3 (C) 1.12 dm^3 (D) 112 cm^3

13 27 g of Al will react completely with how much mass of O_2 to produce Al_2O_3
(A) 8 g of oxygen (B) 16 g of oxygen (C) 32 g of oxygen (D) 24 g of oxygen

14 Insoluble particles can be separated from liquid by
(A) Sublimation (B) Solvent extraction (C) Crystallization (D) Filtration

15 If absolute temperature of a gas is doubled and pressure is reduced to one half , the volume of gas will
(A) Remain unchanged (B) Increase four times (C) Reduce to $\frac{1}{4}$ (D) Be doubled

16 Dipole-induced dipole forces are also called
(A) London Dispersion Forces (B) Debye Forces (C) Hydrogen bonding (D) Huckel Forces

17 The molecules of CO_2 in dry ice form
(A) Ionic crystals (B) Covalent crystals (C) Molecular crystals (D) Any type of crystals

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CHEMISTRY (NEW COURSE)
GROUP FIRST **SUBJECTIVE** TIME : 2 : 40 HOURS
ACADEMIC SESSION : 2015 –17 TO 2017 – 19 MARKS : 68

SECTION-I

QUESTION NO. 2 Write short answers any Eight (8) questions of the following 16

1	Law of conservation of mass has to be obeyed during stoichiometric calculations, give the reasons .
2	Differentiate between theoretical yield and actual yield.
3	Calculate mass of 10^{-3} moles of $MgSO_4$.
4	Write two main characteristics of a solvent selected for crystallization of a compound
5	Define analytical chemistry.
6	Derive Boyle's law from KMT.
7	Write two causes of deviation of gases from ideal behaviour.
8	Write future horizon of Plasma, briefly.
9	Define solubility product along with its one application.
10	Write effect of catalyst on equilibrium constant.
11	Why do we need buffer?
12	Write effect of change in pressure on following reaction at equilibrium state $N_2(g) + 3H_2(g) \rightleftharpoons 2NH_3(g)$

QUESTION NO. 3 Write short answers any Eight (8) questions of the following 16

1	How is cleavage of crystals itself anisotropic behavior ?
2	Why does the electrical conductivity of metals decrease by increasing temperature?
3	Why is 74 % space occupied in closest packing of atoms of metals ?
4	Why do ionic crystals not conduct electricity in solid state?
5	How is bond distance, the compromise distance between two atoms?
6	How does the distinction between a coordinate covalent bond and a covalent bond vanishes after the bond formation in NH_4^+ and H_3O^+ ?
7	Why are the bond angles of H_2O and NH_3 not equal to 109.5° like that of CH_4 although oxygen and nitrogen atoms are sp^3 hybridized?
8	Why are pi (π) bonds more diffused than sigma (σ) bond?
9	Differentiate between Atomization energy and Lattice energy.
10	Why is enthalpy of neutralization of strong acid and strong base is always -57.5 KJ $mole^{-1}$?
11	Why is the molality independent of temperature but molarity depends upon temperature?
12	How has 100 g of 98 % H_2SO_4 , volume of 54.34 Cm^3 of H_2SO_4 ? (Density = 1.84 g Cm^{-3})

QUESTION NO. 4 Write short answers any Six (6) questions of the following 12

1	How positive rays are produced in the discharge tube?
2	How the dual nature of an electron was verified ?
3	How was it inferred that cathode rays are material particles?
4	Write down nuclear reactions for the conversion of Cu into Zn.
5	The oxidation state of oxygen is +2 in OF_2 . Justify it
6	The standard oxidation potential of Zn is + 0.76 v and its reduction potential is - 0.76 v Why?
7	Differentiate between electrolytic and voltaic cell.
8	Define catalytic poisoning and give an example.
9	What is rate-determining step?

SECTION-II

Note: Attempt any Three questions from this section 8 x 3 = 24

5-(A)	Silicon carbide (SiC) is an important ceramic material. It is produced by allowing sand (SiO_2) to react with carbon at high temperature $SiO_2 + 3C \longrightarrow SiC + 2CO$ When 100 kg sand is reacted with excess of carbon, 51.4 kg of SiC is produced. What is the percentage yield of SiC ?
(B)	What are covalent solids? Write properties of covalent solids
6-(A)	Write down any four applications of Dalton's law of partial pressure.
(B)	Explain Heisenberg's uncertainty principle.
7-(A)	Explain sp^3 –hybridization with the help of CH_4 molecule.
(B)	What is the first law of thermodynamics? How does it explain that (i) $q_v = \Delta E$ (ii) $q_p = \Delta H$
8-(A)	State Le-Chattier's Principle. Discuss the effect of pressure and temperature on the following reaction $N_2 + 3H_2 \rightleftharpoons 2NH_3 + heat$
(B)	Balance the following equation by ion-electron method in acidic media $IO_3^{1-} + AsO_3^{3-} \longrightarrow I^- + AsO_4^{3-}$
9-(A)	9.2 Molar $HClO_4$ is available from the market. The density of this solution is 1.54 g cm^{-3}. What is the percentage by weight of $HClO_4$
(B)	Explain velocity constant of a reaction. What will be effect of temperature on velocity constant.

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(11th CLASS – 12018)

CHEMISTRY (NEW COURSE)
GROUP SECOND
ACADEMIC SESSION : 2015 – 2017 TO 2017 – 2019

TIME: 20 MINUTES
MARKS: 17

OBJECTIVE

NOTE: You have four choices for each objective type question as A , B , C and D . The choice which you think is correct , fill that circle in front of that question number. Use marker or pen to fill the circles. Cutting or filling two or more circles will result in zero mark in that question.

QUESTION NO. 1

1 The number of atoms present in 0.5 mole of Na is
(A) 1.0×10^{23} (B) 6.02×10^{23} (C) 2.04×10^{23} (D) 3.01×10^{23}

2 The mass of one mole of electrons is
(A) 1.008 mg (B) 0.55 mg (C) 0.184 mg (D) 1.673 mg

3 Solvent extraction is an equilibrium process and it is controlled by
(A) law of mass action (B) the amount of solvent (C) distribution law (D) the amount of solute

4 Equal masses of methane and oxygen are mixed in an empty container at 25 °C. The fraction of total pressure exerted by oxygen is
(A) $\frac{1}{3}$ (B) $\frac{8}{9}$ (C) $\frac{1}{9}$ (D) $\frac{16}{17}$

5 Heat change for one mole of a solid during converting it into liquid is called
(A) Molar heat of fusion (B) Molar heat of vaporization
(C) Molar heat of sublimation (D) Enthalpy change

6 Which of the following is a pseudo solid?
(A) CaF_2 (B) Glass (C) NaCl (D) Diamond

7 The limiting line of Balmer series lies in
(A) Visible region (B) U.V. region (C) I.R. region (D) X-rays region

8 What is the value of $(n + \ell)$ for the 3d sub-shell?
(A) 3 (B) 4 (C) 5 (D) 6

9 Which of the following molecules has zero dipole moment?
(A) NH_3 (B) $CHCl_3$ (C) H_2O (D) BF_3

10 The amount of energy released by absorbing an electron in the valence shell of an atom is
(A) Ionization energy (B) Electron affinity (C) Electro negativity (D) Bond energy

11 The number of fundamental ways of transferring energy into or out of system is
(A) One (B) Two (C) Three (D) Four

12 When Kc value of a reaction is very small, the equilibrium position lies to
(A) Left (B) Right (C) May be left or right (D) Can not be predicted

13 The pH of 10^{-3} mol dm^{-3} of an aqueous solution of H_2SO_4 is
(A) 3.0 (B) 2.7 (C) 2.0 (D) 1.5

14 Molarity of pure water is
(A) 1 (B) 18 (C) 55.5 (D) 6

15 The molal boiling point constant is the ratio of the elevation in boiling point to
(A) Molarity (B) Molality (C) Mole fraction of solvent (D) Mole fraction of solute

16 Oxidation number of " Cr " in $K_2Cr_2O_7$ is
(A) +2 (B) +4 (C) +6 (D) +8

17 Hydrolysis of Tertiary butyl bromide has order of reaction
(A) First (B) Pseudo first (C) Second (D) Third

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CHEMISTRY (NEW COURSE) | 11th CLASS - 12018 | TIME: 2:40 HOURS
GROUP SECOND | SUBJECTIVE | MARKS: 68
ACADEMIC SESSION: 2015 –17 TO 2017 –19

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SECTION-I

QUESTION NO. 2 Write short answers any Eight (8) questions of the following 16

1	Write importance of combustion analysis.
2	How many formula units are there in 100 g of KCl_3
3	Many chemical reactions taking place in our surrounding involve limiting reactants, give reason
4	Define sublimation.
5	How will you decolonize the undesired colour in a product ?
6	SO_2 is comparatively non ideal at 273K but behave ideally at 327 °C , give reason.
7	Write two applications of Dalton's Law of Partial Pressure
8	Derive Avogadro's Law from KMT.
9	Define Buffer Capacity.
10	What is ionization constant of acids
11	What is effect of temperature on following system at equilibrium $2SO_2(g) + O_2(g) \rightleftharpoons 2SO_3(g)$ $\Delta H = -194.5$ kJ/mol.
12	Define law of mass action .

QUESTION NO. 3 Write short answers any Eight (8) questions of the following 16

1	How do earthen ware vessels keep water cool ?
2	Why are the vapour pressure of solids far less than those of liquids ?
3	Why does ice float on water ?
4	Why are the ionic crystals highly brittle ?
5	Differentiate between ionization energy and electron affinity.
6	Define electro negativity, and how its difference between two atoms affects bond strength ?
7	How does NF_3 and BF_3 have different structural formulae although both have same type of molecular formula?
8	Define dipole moment and write the S.I. units of dipole moment .
9	What is thermo-chemical equation? Give its two examples.
10	State that burning of candle is spontaneous process.
11	Justify that the total volume of solution by mixing 100cm^3 of H_2O with 100 cm^3 of alcohol may not be equal to 200 cm^3 .
12	Justify that one molal solution of urea in H_2O is dilute as compared to one molar solution of urea in H_2O but the number of particles of solute are same?

QUESTION NO. 4 Write short answers any Six (6) questions of the following 12

1	Why are positive rays also called canal rays ? Give its reason.
2	Differentiate between orbit and orbital.
3	State Pauli's Exclusion principle and Hund's rule.
4	Give two importance of Moseley's law.
5	Differentiate between primary cells and secondary cells with two examples.
6	Voltaic cell is reversible cell. Justify it.
7	Define electrode potential and standard electrode potential.
8	Define order of reaction and velocity constant
9	What is heterogeneous catalysis ? Give two examples.

SECTION-II

Note: Attempt any Three questions from this section 8 x 3 = 24

5-(A)	A sample of liquid consisting of carbon, hydrogen and oxygen was subjected to combustion analysis. 0.5439 g of the compound gave 1.039 g of CO_2 , 0.6369 g of water. Determine the empirical formula of the compound.
(B)	Define liquid crystals ; write down three uses of liquid crystals.
6-(A)	State and explain Graham's law of diffusion. Give its experimental verification.
(B)	What are Quantum Number's. Explain Azimuthal Quantum Number.
7-(A)	How will you describe paramagnetic character of O_2 molecule on the bases of molecular orbital theory?
(B)	Define the following with one example (i) System (ii) Surrounding (iii) State function (iv) Endothermic reaction
8-(A)	What are buffer solutions ? Derive Henderson's equation for finding pH of a buffer.
(B)	Describe the electrolysis of aqueous solution of sodium chloride.
9-(A)	The vapour pressure of water at 30 °C is 28.4 torr. Calculate the vapour pressure of a solution containing 70 g of cane sugar ($C_{12}H_{22}O_{11}$) in 1000 g of water at same temperature. Also , calculate the lowering of vapour pressure.
(B)	Give names of different types of methods for determining order of a reaction and explain half-life method.