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Roll No. 262438 to be filled in by the candidate.

Inter (Part-I) A 2013

(For all Sessions)

Paper Code	6	4	8	3

Chemistry (Objective Type)

RWP 2011-19

Time: 20 Minutes **Marks: 17**

NOTE: Write answers to the questions on objective answer sheet provided. Four possible answers A,B,C & D to each question are given. Which answer you consider correct, fill the corresponding circle A,B,C or D given in front of each question with Marker or pen ink on the answer sheet provided.

1.1. An aqueous solution of ethanol in water have vapour pressure:
(A) equal to that of water (B) equal to that of ethanol
(C) more than that of water (D) less than that of water

2. The sum of mole fraction of gas in a mixture of gases is:
(A) always more than one (B) always less than one
(C) always one (D) may be less or more than one

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

4. The rate of reaction:
(A) Increases as the reaction proceeds (B) decreases as the reaction proceeds
(C) remains the same as the reaction proceeds (D) may decrease or increase as the reaction proceeds

5. 27g of 'Al' will react completely with how much mass of O_2 to produce Al_2O_3:
(A) 8g of oxygen (B) 16g of oxygen (C) 32g of oxygen (D) 24g of oxygen

6. The number of moles of CO_2 which contain 8.0g of oxygen is:
(A) 0.25 (B) 0.50 (C) 1.0 (D) 1.50

7. Solvent extraction method is a particularly useful technique for separation when product to be separated:
(A) non volatile or thermally unstable (B) volatile or thermally unstable
(C) non volatile or thermally stable (D) volatile or thermally stable

8. Pressure remaining constant, at which temperature the volume of a gas will become twice of what it is at 0°C?
(A) 546 °C (B) 200 °C (C) 546 K (D) 273 K

9. Amorphous solids:
(A) have sharp melting point (B) Undergo clean cleavage when cut with knife
(C) have perfect arrangement of atoms (D) can possess small regions of orderly arrangement of atoms

10. London dispersion forces are the only forces present among the:
(A) Molecules of water in liquid state (B) Atoms of helium in gaseous state at high temperature
(C) Molecules of solid iodine (D) Molecules of hydrogen chloride gas

11. The nature of the positive rays depends on:
(A) the nature of the electrode (B) the nature of the discharge tube
(C) the nature of the residual gas (D) all these

12. The wave number of the light emitted by a certain source is $2\times10^{6}\ m^{-1}$. The wavelength of this light will be:
(A) 500 nm (B) 500 m (C) 200 nm (D) 5×10^{7} m

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

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

15. In endothermic reaction, the heat content of the:
(A) Product is more than that of reactants (B) Reactant is more than that of products
(C) Both A and B (D) Reactant and product are equal

16. The solubility product of AgCl is 2×10^{-10} mole dm^{-3}. The maximum concentration of Ag^+ ion in the solution is:
(A) 2×10^{-10} mole dm^{-3} (B) 1.41×10^{-5} mole dm^{-3} (C) 1.0×10^{-10} mole dm^{-3} (D) 4.0×10^{-20} mole dm^{-3}

17. The relationship between Kp and Kc is given by:
(A) $Kc = Kp(P)^{\Delta n}$ (B) $Kc = Kp(\frac{P}{N})^{\Delta n}$ (C) $Kp = Kc(RT)^{\Delta n}$ (D) $Kp = Kc(RT)^{-\Delta n}$

Roll No._____ to be filled in by the candidate. (For all Sessions) RWP-11-19

Chemistry (Essay Type)

Time: 2:40 Hours **Marks: 68**

Section - I

2- Write short answers of any eight parts from the following. **2 x 8 =16**

i. Discuss purification of sodium chloride by common ion effect.
ii. Write down the role of magentic separator in mass spectrometer
iii. Define molecular formula and empirical formula. Give relationship between them.
iv. Write down K_c for the following reaction. Suppose the volume of reaction mixture is "V" dm^3 at equilibrium stage.

$$PCl_5 \rightleftharpoons PCl_3 + Cl_2$$

v. How do you justify that the greater quantity of CH_3COONa in acetic acid decreases the dissociation power of acetic acid so the pH increases.
vi. Explain respiration process in the light of Dalton's Law of partial pressure
vii. Convert -40°C into Fahrenheit scale.
viii. Derive Charle's law from kinetic theory of gases.
ix. Define pH and pOH. What is the sum of pH and pOH?
x. What are molecular ions? How are they produced?
xi. How is undesirable colour removed from the crystals?
xii. Define sublimation with examples.

3- Write short answers of any eight parts from the following. **2 x 8 =16**

i. Justify that one molal solution of urea in water is more dilute than its molar solution.
ii. What is meant by symmetry? Give elements of symmetry.
iii. Define colligative properties. Name some important colligative properties.
iv. What is octet rule? Give two examples of compounds which deviate from it
v. A fresh cut metal has a shiny look. Justify it
vi. What factors influence the electron affinity?
vii. No bond in chemistry is 100% ionic. Justify it.
viii. Why the molecule of BF_3 is triangular palner?
ix. What is meant by state function? Give examples.
x. Differentiate between internal energy and enthalpy.
xi. Define crystal and crystallite.
xii. What is habit of a crystal? Give one example.

4- Write short answers of any six parts from the following. **2 x 6 =12**

i. State Moseley's law.
ii. What is Hund's rule?
iii. How atomic emission spectrum is obtained?
iv. Why the positive rays are also called as canal rays?
v. What is Electrochemistry?
vi. Give advantages of Fuel Cell.
vii. What is zero-order reaction? Give an example.
viii. Write two characteristics of a catalyst.
ix. Calculate oxidation state of Cr in (a) $Cr_2(SO_4)_3$ (b) $K_2Cr_2O_7$

Section - II

NOTE: Answer any three questions from the following. **8x3=24**

5. (a) The combustion analysis of an organic compound shows it to contain 65.44% carbon, 5.50% hydrogen and 29.6% of oxygen. What is the emperical formula of the compound if the molar mass of this compound is 110.15 g mol^{-1}? Calculate the molecular formula of the compound. **4**
   (b) Discuss manometric method for the measurement of vapour pressure of a liquid. **4**
6. (a) State and explain Graham's Law of diffusion. **4**
   (b) State and explain Plank's quantum theory **4**
7. (a) Describe the structure of NH_3 and H_2O with the help of atomic orbital hybridization **4**
   (b) Describe Hess's law of constant heat summation with two examples. **4**
8. (a) Derive Handerson's equation for acidic and basic buffer. **4**
   (b) What is electrolysis? Discuss the electrolysis of fused salt $PbBr_2$ **4**
9. (a) The vapour pressure of water at 30°C is 28.4 torr. Calculate the vapour pressure of solution containing 70.0g of cane sugar ($C_{12}H_{22}O_{11}$) in 1000.0 g of water at same temperature. Also calculate the lowering of vapour pressure. **4**
   (b) How does Arrhenius equation help us to calculate the energy of activation of a reaction? **4**