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

Inter. (Part-I)-A-2018

Rwp-11-18

Paper Code	2	4	8	7

Sessions: 2015-2017, 2016-2018 & 2017-2019

Chemistry (Objective Type)

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. In order to mention the boiling point of water at 110°C, the external pressure should be:
(A) between 760 torr and 1200 torr (B) between 200 torr and 760 torr
(C) 765 torr (D) 620 torr

2. The molecules of CO_2 in dry ice form the:
(A) Ionic crystals (B) Covalent crystals
(C) Molecular crystals (D) Metallic crystalls

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

4. When 6d orbital is complete, the entering electron goes into:
(A) 7 f (B) 7 s (C) 7 p (D) 7 d

5. The number of bonds in nitrogen molecule is:
(A) one σ and one π (B) one σ and two π (C) three σ only (D) two σ and one π

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

7. The change in heat energy of a chemical reaction at constant temperature and pressure is called:
(A) enthalpy change (B) heat of sublimation (C) bond energy (D) internal energy change

8. For which system does the equilibrium constant, Kc has units of $(concentration)^{-1}$?
(A) $N_2 + 3H_2 \rightleftharpoons 2NH_3$ (B) $H_2 + I_2 \rightleftharpoons 2HI$ (C) $2NO_2 \rightleftharpoons N_2O_4$ (D) $2HF \rightleftharpoons H_2 + F_2$

9. 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

10. Molarity of pure water is:
(A) 1 (B) 18 (C) 55.5 (D) 6

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

12. The unit of the rate constant is the same as that of the rate of reaction in
(A) first order reaction (B) second order reaction (C) zero order reaction (D) third order reaction

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

14. The atomicity of $C_6H_{12}O_6$ is:
(A) 6 (B) 12 (C) 3 (D) 24

15. The comparative rate at which the solute moves in paper chromatography depends on:
(A) the size of paper (B) R_f value of solutes
(C) Temperature of the experiment (D) Size of chromatographic tank used

16 The order of the rate of diffusion of gases NH_3, SO_2, Cl_2 and CO_2 is:
(A) $NH_3 > SO_2 > Cl_2 > CO_2$ (B) $NH_3 > CO_2 > SO_2 > Cl_2$ (C) $SO_2 > NH_3 > CO_2 > Cl_2$ (D) $CO_2 > SO_2 > Cl_2 > NH_3$

17. The number of molecules in one dm^3 of water is close to:
(A) $\frac{6.02}{22.4} \times 10^{23}$ (B) $\frac{12.04}{22.4} \times 10^{23}$ (C) $\frac{18}{22.4} \times 10^{23}$ (D) $55.6 \times 6.02 \times 10^{23}$

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Sessions: 2015-2017, 2016-2018 & 2017-2019

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. Write the names of any four methods employed for the separation of isotopes.
ii. Law of conservation of mass has to be obeyed during stoichiometric calculations. Justify it.
iii. What is the difference between adsorption and partition chromatography.
iv. Hydrogen and helium are ideal at room temperature, but SO_2 and Cl_2 are non ideal. How do you explain it?
v. Justify that the volume of given mass of a gas becomes theoretically zero at 273°C.
vi. What is buffer solution? Give types of buffer solution with their composition.
vii. What do you know about gram atom?
viii. Define solvent extraction and partition law.
ix. Write any two methods for drying the crystals.
x. Why pilots feel uncomfortable breathing at high altitude?
xi. How do buffers act? Give example of acidic buffer.
xii. Prove that $Pk_a + Pk_b = 14$ at 25°C.

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

i. How is dynamic equilibrium established during evaporation of a liquid in a closed vessel at constant temperature?
ii. Why is boiling point of water different in Murree and Mount Everest?
iii. Justify that one molal solution of urea in H_2O is dilute as compared to one molar solution of urea but the number of particles of solute is same?
iv. Why the concentration term of molality is independent of temperature but molarity depends upon temperature?
v. Differentiate between Continuous spectrum and Line spectrum?
vi. Calculate mass of electron by using its value of charge and e/m value.
vii. How was neutron discovered by James Chadwick? Prove it by a nuclear reaction.
viii. How is caustic soda obtained by electrolysis of aqueous solution of NaCl? Write only the chemical reactions occuring at different electrodes.
ix. Define oxidation number and calculate oxidation number of chromium in K_2CrO_4.
x. Why do earthenware vessels keep water cool?
xi. Define isomorphism and give one example.
xii. What is Bohr's atomic model? Give its two postulates.

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

i. Why Cationic radius is smaller than atomic radius of atom?
ii. Differentiate between polar and non-polar covalent bond.
iii. Differentiate between endothermic and exothermic reactions.
iv. Why does O_2 show paramagnetic character?
v. Why is Pi-bond weaker than Sigma bond?
vi. Define Thermochemical equation.
vii. How can half life be used to determine order of reaction?
viii. Discuss a reaction to explain specification of Catalyst.
ix. Discuss two characteristics of enzyme.

Section - II

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

5. **(a)** Ascorbic acid (vitamin C) contains 40.92% carbon, 4.58% hydrogen and 54.5% of oxygen by mass. What is the empirical formula of ascorbic acid? **4**
   (b) Write down any four properties of Ionic solids. **4**
6. **(a)** Give the statement of Dalton's Law of partial pressure. How does this law help to find out the partial pressure in the mixture of gases? **4**
   (b) Explain Millikan's oil drop experiment to determine the charge on electron. **4**
7. **(a)** Describe measurement of enthalpy of a reaction with bomb calorimeter. **4**
   (b) Explain paramegnetic behaviour of oxygen molecule on the basis of Molecular Orbital Theory. **4**
8. **(a)** $N_{2\,(g)}$ and $H_{2\,(g)}$ combine to give $NH_{3\,(g)}$. The value of Kc in this reaction at 500°C is 6.0×10^{-2}. Calculate the value of Kp for this reaction. **4**
   (b) Describe four uses of electrolysis process in industries. **4**
9. **(a)** Discuss Raoult's law for the solution in which both components are volatile. **4**
   (b) What is catalysis? Explain its types with one example of each. **4**