April-2016

Seat Number

किनार - 005

CHEMISTRY PAPER - I : CH-121
Physical and Inorganic Chemistry
(113201)

P. Pages : 4

Time : Two Hours **Max. Marks : 60**

Instructions to Candidates :

1. Do not write anything on question paper except Seat No.
2. Graph or diagram should be drawn with the black ink pen being used for writing paper or black HB pencil.
3. Students should note, no supplement will be provided.
4. All questions are compulsory.
5. Figures to the right indicate full marks.
6. Use of logarithmic table and non programmable calculator is allowed.

1. a) Attempt **any six** of the following. 6

i) A process which take place on its own accord is called as ------

a) Reversible process b) Irreversible process

c) Spontaneous process d) Non-spontaneous process.

ii) For exothermic reaction, entropy change is ------

a) Positive b) Zero

c) Constant d) Negative

iii) The degree of dissociation is calculated using the equation

a) $\alpha = \frac{1000LS}{c}$ b) $\alpha = \frac{\wedge}{\wedge_0}$

c) $\alpha = \frac{\wedge_0}{\wedge}$ d) $\alpha = \wedge \times \wedge_0$

iv) The specific conductance and conductance of a solution are same, then the cell constant is

a) zero b) 0.5

c) 1.0 d) 10.0

v) The CGS unit of surface tension is

a) Newton per metre b) Dyne per cm

c) Centidyne sec d) Poise

vi) In a N_2 molecule there are

a) One sigma and one pi bond

b) One sigma and two pi bonds

c) Two sigma and one pi bond

d) Three sigma bonds

vii) The bond formed between two atoms due to the combined process of transfer & a sharing of a pair of electrons is called

a) covalent bond b) Ionic bond

c) coordinate bond d) Metallic bond

viii) The impurities present in the mineral are called

a) Flux b) Alloy

c) Gangue d) Slag

b) Answer in one sentence each **any six.** 6

i) What is the unit of entropy?

ii) Define Physical transformation.

iii) What is the unit of cell constant?

iv) Give the relation between conductance and resistance.

v) Define Viscosity.

vi) Define Metallic bond.

vii) What is thermite?

viii) Define Mineral.

2. Attempt **any six** of the following. 12

i) State second law of thermodynamics based on entropy.

ii) Define entropy change and give its mathematical equation.

iii) Define specific resistance and give its unit.

iv) What is equivalent conductance at infinite dilution?

v) What are the factors affecting surface tension?

vi) Define coefficient of Viscosity.

vii) Why rain drops are spherical in shape?

viii) Explain S – P overlap with suitable example.

ix) Define roasting.

3. Answer **any four** of the following. 12

i) Explain spontaneous process with suitable examples.

ii) Give Physical significance of entropy.

iii) What is cell constant? How it is determined?

iv) Write Poiseuille's equation and signify the terms.

v) Explain magnetic separation method.

vi) Give the postulates of Heitler – London theory.

4. Attempt **any three** of the following. 12

i) Calculate the entropy change in reversible isothermal process at 30°C when 3 moles of an ideal gas change its volume from 8 litre to 25 litres. (R = 8.314 J).

ii) If the equivalent conductances at infinite dilutions of KCl, HCl & KNO_3 are 149.9, 426.2 & 145.0 mhos cm^2 $equi^{-1}$ respectively at 25°C, then find the equivalent conductance at infinite dilution of HNO_3 at 25°C.

iii) How high will sap rise in a plant if capillaries are 0.01mm diameter, the densities of the fluid is 1.3 gm/cm^3 and its surface tension is 6.5 dyne/cm (g = 981 cm/s^2)

iv) With the help of Lewis dot structure, explain the formation of NH_3 and H_2O molecule.

v) Explain "Gold-schmidt Aluminothermic Process" of reduction of metals.

5. Attempt **any two** of the following. **12**

i) Show that entropy of mixing for Ideal gases is always positive.

ii) Define conductometric titration? Explain conductometric titration of a strong acid with strong base.

iii) Define P – P overlap. Explain the formation of F_2 & O_2 molecule.

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