Seat Number

Nov-2015

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कात - 010

CHEMISTRY PAPER - I : CH - 121
Physical & Inorganic Chemistry
(12135)

P. Pages : 3

Time : Two Hours **Max. Marks : 40**

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. Draw neat diagram wherever necessary. Figures to right indicates full marks.
6. Use of logarithmic table and nonprogrammable calculator is allowed.

1. Attempt **any eight** of the following. **8**

i) The critical temperature of CO_2 is ----------

a) 13.1°C b) 21.5°C
c) 31.1°C d) 50.5°C

ii) The Unit of Vander Waal constant 'b' is -------

a) Lit atm $deg^{-1}mol^{-1}$ b) atm deg^{-1}
c) Lit mol^{-1} d) $deg^{-1}k$

iii) The critical volume is related with Vander Waal constant as ----

a) $V_C = \frac{3}{b}$ b) $V_C = \frac{4}{3}b$
c) $V_C = 3b$ d) $V_C = \sqrt{b}$

iv) The kinetic energy of gases is directly proportional to

a) Volume b) Pressure
c) Density d) temperature

v) Miller indices are ------ of intercept in terms of unit intercept

a) Square b) Reciprocal
c) Square root d) Cube

vi) Crystals can be classified into------ basic crystal systems.
a) 3 b) 4
c) 7 d) 14

vii) The number of electrons in the valence shell is equal to its----
a) Atomic mass b) group number
d) Period number d) Atomic number

viii) In the following elements which one is non-metal
a) Carbon b) Silicon
c) Germanium d) Tin

ix) In modern periodic table the elements are arranged in accordance with increasing their-----
a) Atomic weight b) Density
c) Atomic volume d) Atomic number

x) For 1:1 type of electrolyte $AB \rightarrow A^+ + B^-$, the solubility product is -------
a) $2s=K_{sp}$ b) $\sqrt{s}=K_{sp}$
c) $s=K_{sp}$ d) $s^2=K_{sp}$

2. Answer any **four** of the following. 8

i) What is Boyle's temperature?

ii) Write Kinetic gas equation, state the terms involved in its.

iii) Define crystalline substance with examples.

iv) State the law of constancy of interfacial angles.

v) Define :

a) Ionization energy.

b) Electronegativity.

vi) What are the group reagents of III A and III B groups in qualitative analysis?

3. Answer **any two** of the following. 8

i) Deduce Graham's Law of diffusion by using kinetic gas equation.

ii) Define and explain weiss indices and miller indices.

iii) Calculate the compressibility factor of 2 moles of nitrogen gas occupying the volume of 0.20 Lit at 100 atm pressure and -100°C temperature. (R=0.082 Lit atm)

4. Answer **any two** of the following. 8

i) Why atomic size of an element decreases in a period and increases in a group in periodic table with increasing atomic number?

ii) Write a short note on solubility product.

iii) Derive an Vander Waal's equation of state.

5. a) Answer **any one** of the following. 6

i) State the important assumptions of kinetic theory of gases.

ii) Explain the following properties of elements in periodic table
   a) Metallic character
   b) Electron affinity.

b) Give the number of atoms present in simple cubic, body centered, and face centered cubic cell. 2

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