Oct-2013

Seat No. | | | | | | |

क्रय - 030

CHEMISTRY PAPER - I (NEW) (11135) CH-111
Physical & Inorganic Chemistry

P. Pages : 3

Time : Two Hours | Max. Marks : 40

Instructions to Candidates :

1. Do not write anything on question paper except Seat No.
2. Answersheet should be written with blue ink only. Graph or diagram should be drawn with the same 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. Draw a neat diagram wherever necessary.
7. Use of logarithmic table and non programmable calculator is allowed.

1. Answer **any eight** of the following : **8**

i) If $y = \sin x$, $\frac{dy}{dx} = ...$

a) $\sin x$ b) $\cos x$
c) $\tan x$ d) cosec x.

ii) If $10^2 = 100$, $\log_{10} 100 = ...$

a) 2 b) 4
c) 1 d) 3

iii) $\int x^5 dx$ is ------

a) $\frac{x^5}{5} + c$ b) $\frac{1}{x} + c$

c) $\frac{x^6}{6} + c$ d) $\frac{x^7}{7} + c$

iv) General equation of a straight line passing through origin is ------

a) $y = mx + c$ b) $\frac{x}{a} + \frac{y}{b} = 1$

c) $y = mx$ d) none of these.

v) SI unit of surface tension is ------
a) dyne b) dyne cm^{-1}
c) Newton d) Newton m^{-1}.

vi) The specific conductance is the conductance of ------
a) one cm^3 of solution b) one cm^2 of solution
c) one cm of solution d) none of these.

vii) SP^3d^2 hybrid orbital are -------
a) linear b) pentagonal
c) trigonal d) octahedral.

viii) The d-orbital involved in SP^3d hybridization is -------
a) $d_{x^2-y^2}$ b) d_{xy}
c) d_{z^2} d) d_{zx}.

ix) The bond angle around the atom which uses SP^2 hybrid orbital is -----
a) 105° b) 120°
c) 180° d) 109°

x) The ionic compound is -----
a) SO_3 b) $IC\ell$
c) KI d) $CHCl_3$.

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

i) What are metallic conductors and electrolytic conductors ? Give one example each.

ii) What is the effect of temperature on viscosity ?

iii) Find the equation of a straight line passing through a point (2, 3) and having slope 3.

iv) Find the value of e^{-7}.

v) Draw the Lewis structure of H_2O molecule.

vi) Explain the structure of Ammonia molecule.

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

i) Differentiate with respect to X :

a) $y = x^3 - x^2 + x$.

b) $y = \frac{x^2 + 6}{x - 1}$

ii) Evaluate the following :

a) $\int (x^6 + 5x^2 + 3)\, dx$

b) $\int_1^2 (x^2 - 7x + 5)\, dx$

iii) Find the relative viscosity of n-propanol at 20°C if the time of flow for water and n-propanol are 130 seconds and 480 seconds respectively. Density of water and n-propanol are $1 gcm^{-3}$ and $0.9982 gcm^{-3}$ respectively. Viscosity coefficient of water is 1 centipoise.

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

i) Give any four assumptions of valence bond theory.

ii) Explain the shape of ammonia molecule on the basis of VSEPR theory.

iii) Describe stalagmometer method for determination of surface tension with a neat diagram.

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

i) Explain the conductometric titration of strong acid and strong base. Give the advantages of conductometric titrations.

ii) Explain structure of PCl_5 molecule on the basis of SP^3d hybridisation. Write the steps involved in it. Give any two characteristics of SP^3d hybridisation.

b) Why does specific conductance fall with dilution ? 2

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