



DW-003-001203

Seat No. _____

B. Sc. (Sem. - II) (CBCS) Examination

April / May – 2015

C-201 : Chemistry (New Course)

Faculty Code : 003

Subject Code : 001203

Time : $2\frac{1}{2}$ Hours]

[Total Marks : 70

Instructions:

- (1) Questions one contains 20 MCQ type questions of one mark each. All are compulsory.
- (2) Question 2 and 3 carry 25 marks each with internal option.
- (3) Write answer of all questions in main answer sheet.

SECTION-I

[1] **Select the correct answer:**

20

- [1] The isomer which rotates the plane of polarized light to the right is calledrotatory.
(a) Laevo (b) Dextro
(c) (+) and (-) (d) All of these
- [2] Which of the following is bidentate ligand?
(a) Glycinato (b) Ethylene amine
(c) Ammonia (d) EDTA
- [3] According to VBT, O₂ molecule isin nature.
(a) Diamagnetic (b) Paramagnetic
(c) Both (a) and (b) (d) None of these
- [4] Delocalization of electrons in a molecule can only be explained by
(a) Theory of hybridization (b) MOT
(c) VBT (d) Hund's rule
- [5] Ionic solids are generally.....
(a) Quite brittle (b) Good conductor of electricity
(c) Volatile (d) Soft
- [6] The crystal is generally colored when associated with.....defect.
(a) Metal excess (b) Frenkel
(c) Metal deficiency (d) Schottky
- [7] Which of the following has the highest boiling point?
(a) CH₃CH₂CH₂CH₂Cl (b) HOCH₂CH₂CH₂CH₂OH
(c) CH₃CH₂CH₂CH₂OH (d) CH₃CH₂OCH₂CH₃
- [8] Which of the following reagents will replace –OH group by a halogen atom?
(a) NOCl (b) SOCl₂
(c) Br₂ (d) I₂
- [9] Ethyl bromide reacts with sodium methoxide to form.....
(a) Diethyl ether (b) Ethyl methyl ether
(c) Dimethyl ether (d) n-Propyl alcohol
- [10] Hinsberg's reagent is
(a) Sn + HCl (b) p-Toluenesulphonic acid
(c) N₂H₄ + KOH (d) Benzenesulphonyl chloride

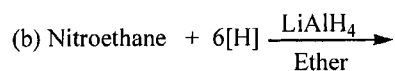
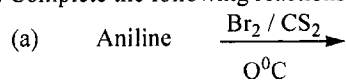
- [11] The pH of drinking water is
- (a) 8 to 9 (b) 1 to 7
(c) 7 to 14 (d) 7
- [12] Permanent hardness are responsible for theof calcium and magnesium.
- (a) Sulphide and nitrate (b) chloride and bromide
(c) Sulphate and chloride (d) sulphate and iodide
- [13] In a galvanic cell, $\text{Cu}^{2+} + 2\text{e}^- \rightarrow \text{Cu}$, reaction takes place at;
- (a) Anode (b) Anode and cathode
(c) Cathode (d) none of these
- [14] Quinhydrone electrode is an example ofelectrode.
- (a) Amalgam (b) Gas
(c) Redox (d) Metal-Metal ion
- [15] Borex powder is
- (a) B_2O_3 (b) $\text{Na}_2\text{B}_4\text{O}_7 \cdot 10\text{H}_2\text{O}$
(c) NaBO_2 (d) $\text{Na}_2\text{B}_4\text{O}_7 \cdot 8\text{H}_2\text{O}$
- [16]] Which metal gives violet colour in flame test?
- (a) Na (b) Co
(c) K (d) Ba
- [17] The enzyme, which can catalyse the conversion of glucose to ethanol, is.....
- (a) Maltase (b) Diatase
(c) Invertase (d) Zymase
- [18] A catalyst
- (a) May be in same phase with the reactants or a different phase (b) may accelerate a reaction
(c) Affects a reaction without being consumed in the process (d) all of the above
- [19] Calculate the solubility of Ag_2CrO_4 , if its solubility product is 1.9×10^{-12} at 300 K.
- (a) 8.7×10^{-5} mol/lit (b) 7.8×10^{-5} mol/lit
(c) 8.7×10^{-4} mol/lit (d) 8.7×10^{-4} mol/lit
- [20] One Einstein is given by (N is Avogadro's number)
- (a) $E = \frac{Nhc^2}{\lambda}$ (b) $E = \frac{Nhc}{\lambda^2}$
(c) $E = \frac{Nhc}{\lambda}$ (d) $E = \frac{Nh}{\lambda}$

SECTION-II

[2] (A) Answer any three questions:

[06]

- Give IUPAC names and structure of following compounds.
(a) Phloroglucinol (b) Quinol
- Derive the value of r^+/r^- for square planar lattice.
- Explain with example Hydration Isomerism.
- Draw the structure of Cesium chloride.
- Why aliphatic amines are more basic than ammonia?
- Complete the following reactions.



(B) Answer any three questions:

[09]

- Explain any three characteristics of Ionic solid.
- Give the difference between BMO and ABMO.
- Give only reaction of Ethanol with (a) Acetyl chloride (b) PCl_5 (c) SOCl_2 .
- Give chemical properties of primary alkyl amine.
- Derive Max-Born equation for the calculation of lattice energy.
- Give example of Cis-trans and meridional-facial isomer in six-coordinate complex compound.

(C) Answer any two questions: [10]

- (1) Calculate bond order and magnetic properties of NO molecule using MOT.
- (2) Explain Fries Reaction with mechanism (Fries Migration).
- (3) Explain Geometrical isomerism in 4-coordinate complex compounds
- (4) Explain Diazotization of aniline and Sandmeyer reaction.
- (5) What is semiconductor? Explain n-type and p-type semiconductor.

[3] (A) Answer any three questions: [06]

- (1) Write the oxidation and reduction reaction of following cell.
$$\text{Mg}_{(s)} / \text{Mg}^{+2}_{(aq)} // \text{Ag}^{+}_{(aq)} / \text{Ag}_{(s)}$$
- (2) Give two example of Enzymes catalysis.
- (3) Explain Beer's law with formula.
- (4) Explain types of hardness of water.
- (5) Give relation of solubility and solubility product of $\text{Ca}_3(\text{PO}_4)_2$.
- (6) Calculate the solubility of PbCl_2 when its solubility product is 1.0×10^{-6} at 298K temperature.

(B) Answer any three questions: [09]

- (1) What is catalyst? Give types of catalysis.
- (2) What is Photosensitization? Explain with any one example.
- (3) Write short note on "Borex-bead test".
- (4) Discuss reversible and irreversible cell.
- (5) How can measured total suspended solids in water?
- (6) The solubility of AgCl is 1.5×10^{-10} . Predict whether there will be any precipitation by mixing 50 ml of 0.01 M NaCl and 50 ml of 0.01 M AgNO_3 solution.

(C) Answer any two questions: [10]

- (1) What is quantum efficiency? Give reasons for high and low quantum efficiency.
- (2) Discuss with example 'Acid-Base Catalysis'.
- (3) Explain Complexometric method for determination of hardness of water.
- (4) What is common ion effect? Explain with NH_4OH and NH_4Cl example.
- (5) Derive the following relation in EMF.
 - (a) Gibbs free energy (G) and Enthalpy (H)
 - (b) Gibbs free energy (G) and Equilibrium constant (K)