



AP-003-045101 Seat No. _____
BVOC (CHE TECH) (Sem. I) (CBCS) Examination
March/April - 2016
BVCT - 101 : Core Fundamental Chemistry - I

Faculty Code : 003
Subject Code : 045101

Time : 3 Hours]

[Total Marks : 70

- Instructions :** (1) All questions are compulsory & carry equal marks.
(2) Draw diagram and/or scheme wherever necessary.

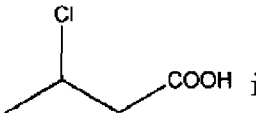
- 1 (a) Answer the following multiple choice questions : 10
- (1) Which of the following -equations are correct?
(A) $H = E + PV$ (B) $E = H - PV$
(C) $PV = H - E$ (D) All of these
 - (2) A process returns to original state, after completing a series of changes. Then this process is known as _____
(A) Adiabatic process (B) Cyclic process
(C) Isothermal process (D) Irreversible process
 - (3) Normality of 0.02M Ca(OH)_2 is _____
(A) 0.1 N (B) 0.02 N
(C) 0.04 N (D) 0.01 N
 - (4) Mole per litre is also known as _____
(A) Molarity (B) Molality
(C) Normality (D) None of these
 - (5) Correct electron configuration of oxygen is _____
(A) $1s^2 2s^2 2p^3 3s^1$ (B) $1s^2 2s^2 2p^2 3s^2$
(C) $1s^2 2s^2 2p^4$ (D) None of above
 - (6) For a given system, First Ionization Potential (I_1) _____ Second Ionization Potential (I_2)
(A) Does not depend on
(B) Equal to
(C) Is greater than
(D) Is less than

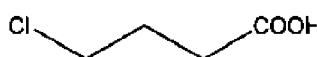
- (7) A saturated solution is that in which...
- concentration of dissolved and undissolved solute is same
 - there exists an equilibrium between dissolved and undissolved solutes
 - concentration of undissolved solute is negligible
 - concentration of dissolved solute is negligible
- (8) The order of successive ionization energy is,
- $I_1 < I_2 < I_3$
 - $I_1 > I_2 < I_3$
 - $I_3 < I_2 < I_1$
 - $I_1 < I_2 > I_3$
- (9) According to concept of Lowry-Bronsted, base has a tendency to _____
- Donate OH^{-1}
 - Accept H^{+1}
 - Donate lone pair of electrons
 - All of above
- (10) In the aqueous solution of HCl, _____
- $[\text{H}^+] = 1.0 \times 10^{-7}$
 - $[\text{H}^+] < 1.0 \times 10^{-7}$
 - $[\text{H}^+] > 1.0 \times 10^{-7}$
 - $[\text{H}^+] = 1.0 \times 10^{-14}$

(B) Answer the following multiple choice questions. 20

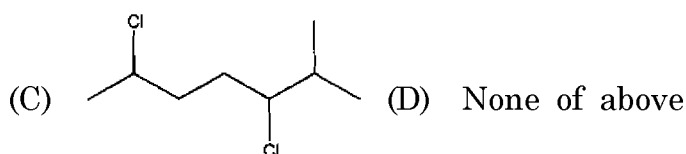
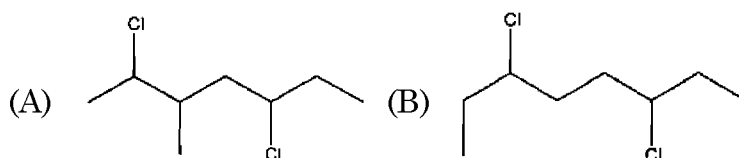
- (1) The change of the entropy of a system may be defined as the summation of _____ divided by _____ during each infinite small change of a process carried out reversibly.
- Heat exchange, absolute temperature
 - Absorbed heat, relative temperature
 - Heat release, decrease temperature
 - Heat, work
- (2) For a nonspontaneous process ΔG is _____ than zero and for a spontaneous process ΔG is _____ than zero.
- More, less
 - Less, more
 - Less, less
 - More, equal
- (3) In 1M one litre H_2SO_4 , water is added to make 5 litre. Normality of this diluted H_2SO_4 is _____
- 0.2 N
 - 0.33 N
 - 5 N
 - 2.5 N

- (4) What will be molarity and normality of a solution containing 14.7 gm H_3PO_4 in 1.5 litre solution?
 (A) 0.6M, 0.2N (B) 0.2M, 0.6N
 (C) 0.6M, 0.6N (D) 0.1M, 0.3N
- (5) What are correct electronic configurations of Cr and Cu?
 (A) Cr: $[\text{Ar}]3d^6$ Cu: $[\text{Ar}]3d^5 4s^1 4d^5$
 (B) Cr: $[\text{Ar}]3d^5 4s^1$ Cu: $[\text{Ar}]3d^{10} 4s^1$
 (C) Cr: $[\text{Xe}]3d^5 4s^1$ Cu: $[\text{Xe}]3d^9 4s^2$
 (D) Cr: $[\text{Ar}]3d^4 4s^2$ Cu: $[\text{Ar}]3d^9 4s^2$
- (6) In a periodic table, Electronegativity _____ along the period and _____ down the group.
 (A) Increases, Decreases
 (B) Decreases, Increases
 (C) Increases, Increases
 (D) Decreases, Decreases
- (7) According to Lewis theory, AlCl_3 is _____ while Aniline is _____
 (A) Acid, Base (B) Metal, Non-metal
 (C) Base, Acid (D) Neutral, Base
- (8) 2,3-dichloro pentane burns with _____ flame in biestain test, and _____ flame when heated over porcelain piece,
 (A) Green, non-shooty (B) Yellow, non-shooty
 (C) Yellow, shooty (D) Green, shooty

- (9) Correct IUPAC name of  is _____ and



- (A) 3-chlorobutanoic acid, 4-chlorobutanoic acid
 (B) 2-chlorobutanoic acid, 1-chlorobutanoic acid
 (C) 3-chloropentanoic acid, 4-chloropentanoic acid
 (D) 3-chloroacetic acid, 4-chlorobutanoic acid
- (10) What is the correct structure of 3,6-dichloro-2 methylheptane?



2 Answer any 4 out of the following 6 questions : **20**

- (1) Write a detailed note on wave particle duality.
- (2) Write a detailed note in Atomic Radii, including factors affecting Atomic Radii, classification of Atomic Radii, and variation in Atomic Radii in periodic table.
- (3) Explain chemistry and applications of following tests in organic qualitative analysis: (i) Lassaigne Test (ii) Nature Test (or Test for Nature)
- (4) Explain separation of Cd^{+2} and Cu^{+2} .
- (5) Write a short note on internal energy and enthalpy.
- (6) Explain primary and secondary standards in detail.

3 Answer any 4 out of the following 6 questions. **20**

- (1) Explain following terms in brief:
 - (i) Boiling point elevation,
 - (ii) Osmotic Pressure.
- (2) Write a detailed note on Inductive effect with example.
- (3) Explain the buffer action for the mixture of NH_4OH and NH_4Cl with mechanism.
- (4) Deduce an expression for the degree of hydrolysis (x) of a weak acid strong base in terms of K_a and K_w .
- (5) Define and explain electro negativity and electron affinity.
- (6) Describe the procedure of separating liquid mixture by fractional distillation.