



# ST. LAWRENCE HIGH SCHOOL

27, BALLYGUNGE CIRCULAR ROAD



**Class : 12**

**Subject : CHEMISTRY**

**Term : SECOND TERM**

**Max Marks : 80**

**Q 1 :** The osmotic pressure of a solution of cane sugar is 5.07 atm at 150°C (Molecular mass = 342). What is the percent of the solution of cane sugar? **Marks : 1**

- 1 . 5%
- 2 . 6%
- 3 . 6.75%
- 4 . 5.75%

( This Answer is Correct )

**Q 2 :** When 100 g of sucrose (Molar mass = 342) is added to 100 g of water, the vapour pressure is lowered to 0.125 mm Hg at 25°C. What is the vapour pressure of pure water at 25°C. **Marks : 1**

- 1 . 2.38 mm Hg
- 2 . 1.15 mm Hg
- 3 . 0.11 mm Hg
- 4 . 23.8 mm Hg

( This Answer is Correct )

**Q 3 :** In a chemical reaction, only those collisions of molecules are effective in which the colliding molecules possess a minimum amount of energy called? **Marks : 1**

- 1 . Average internal energy
- 2 . Activation energy.
- 3 . None of these
- 4 . Threshold energy.

( This Answer is Correct )

**Q 4 :** In case of slow reaction, if the temperature is increased by 10 K, then point out the false statement? **Marks : 1**

- 1 . Average K.E decreases
- 2 . Energy of activation decreases
- 3 . Threshold energy increases
- 4 . Number of collisions, get multiplied

( This Answer is Correct )

**Q 5 :** The half-life period of first order reaction is 1386 seconds. The specific rate constant of the reaction is- **Marks : 1**

- 1 .  $0.5 \times 10^{-2} \text{ s}^{-1}$
- 2 .  $0.5 \times 10^{-3} \text{ s}^{-1}$
- 3 .  $5.0 \times 10^{-2} \text{ s}^{-1}$

( This Answer is Correct )

4 .  $5.0 \times 10^{-3} \text{ s}^{-1}$

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**Q 6 :** Radioactivity of a sample ( $z = 22$ ) decreases 90% after 10 years. What will be the half-life of the sample? **Marks :** 1

1 . 3 years

( This Answer is Correct )

2 . 10 years

3 . 2 years

4 . 5 years

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**Q 7 :** The Nernst equation is useful for determining- **Marks :** 1

1 . Electrode potential of a cell

2 . Equilibrium constant

3 . Both a and b

( This Answer is Correct )

4 . None of these

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**Q 8 :** The ionic conductance of  $\text{Ba}^{2+}$  and  $\text{Cl}^-$  are respectively 127 and 76  $\text{ohm}^{-1}$  at infinite dilution. The equivalent conductance of  $\text{BaCl}_2$  at infinite dilution will be **Marks :** 1

1 . 139

2 . 203

3 . 279

( This Answer is Correct )

4 . None of these

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**Q 9 :** The conductivity of electrolytic (ionic) solutions depends on- **Marks :** 1

1 . the nature of the electrolyte added

2 . temperature

3 . size of the ions produced and their solvation

4 . all of these

( This Answer is Correct )

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**Q 10 :** The Lowest electrical conductivity of the following aqueous solutions is of **Marks :** 1

1 . 0.1 M acetic acid

( This Answer is Correct )

2 . 0.1 M chloroacetic acid

3 . 0.1 M fluoroacetic acid

4 . 0.1 M difluoroacetic acid

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**Q 11 :** Phenol acts as a stronger acid than alcohol, due to- **Marks :** 1

1 . Resonance effect

( This Answer is Correct )

2. Hyper conjugation effect
3. Electromeric effect
4. None of these

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**Q 12 :** Action of nitrous acid on ethylamine gives-

**Marks :** 1

1. C<sub>2</sub>H<sub>6</sub>
2. C<sub>2</sub>H<sub>5</sub>OH
3. C<sub>2</sub>H<sub>5</sub>OH and C<sub>2</sub>H<sub>4</sub>
4. C<sub>2</sub>H<sub>5</sub>OH and NH<sub>3</sub>

( This Answer is Correct )

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**Q 13 :** XCH<sub>2</sub>OCH<sub>3</sub> on treatment with CH<sub>3</sub>MgBr (in Dry ether) followed by hydrolysis forms

**Marks :** 1

1. CH<sub>3</sub>OCH<sub>3</sub>
2. PhOPh
3. PhOCH<sub>3</sub>
4. CH<sub>3</sub>CH<sub>2</sub>OCH<sub>3</sub>

( This Answer is Correct )

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**Q 14 :** Amongst the following phenols which is most acidic?

**Marks :** 1

1. Picric acid
2. 2-Nitrophenol
3. 2,4-Dinitrophenol
4. m-Nitro phenol.

( This Answer is Correct )

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**Q 15 :** The geometry of the carbonyl group is-

**Marks :** 1

1. Trigonal planar
2. Pyramidal
3. Square planar
4. Linear

( This Answer is Correct )

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**Q 16 :** In base catalyzed reaction of carbonyl compound the catalyst-

**Marks :** 1

1. Increases the nucleophilic character of reagent
2. Increases the electrophilic character of carbonyl compound
3. Acidic character of reagent
4. both a and b

( This Answer is Correct )

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**Q 17 :** Aldehyde and ketone can be distinguished by-

**Marks :** 1

( This Answer is Correct )

- 1 . Tollens reagent
  - 2 . Sodium bisulphite addition
  - 3 . Brady's reagent
  - 4 . All of these
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**Q 18 :** Clemmensen reduction of a ketone is carried out in the presence of which of the following?

**Marks :** 1

- 1 . H<sub>2</sub> and Pt as catalyst
- 2 . Glycol with KOH
- 3 . Zn-Hg with HCl
- 4 . LiAlH<sub>4</sub>

 ( This Answer is Correct )

**Q 19 :** The strongest acid among the following is

**Marks :** 1

- 1 . Dichloroacetic acid
- 2 . Dimethyl acetic acid
- 3 . Trifluoro acetic acid
- 4 . Triiodo acetic acid

 ( This Answer is Correct )

**Q 20 :** When acetic acid is treated with P<sub>2</sub>O<sub>5</sub>, the product is

**Marks :** 1

- 1 . Ester
- 2 . Ether
- 3 . Alcohol
- 4 . Acid anhydride

 ( This Answer is Correct )

**Q 21 :** The test which is used for the identification of amino-acids is-

**Marks :** 1

- 1 . Ninhydrin test
  - 2 . Molisch test
  - 3 . Diuretic test
  - 4 . Benedict test
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 ( This Answer is Correct )

**Q 22 :** In the formation of Zwitterions proton goes from

**Marks :** 1

- 1 . Carboxyl to an amino group
  - 2 . Amino to a carboxyl group
  - 3 . Amino group only
  - 4 . Carboxyl group only
- 

 ( This Answer is Correct )

**Q 23 :** Graphite has a structural similarity with-

**Marks :** 1

1. B<sub>2</sub>H<sub>6</sub>
2. B<sub>4</sub>C
3. B
4. BN

( This Answer is Correct )

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**Q 24 :** P<sub>4</sub>O<sub>10</sub> has \_\_\_\_\_ bridging O atoms

**Marks :** 1

1. 4
2. 5
3. 6
4. 2

( This Answer is Correct )

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**Q 25 :** In basic medium one mole of MnO<sub>4</sub><sup>-</sup> accepts how many moles of electrons in a redox process?

**Marks :** 1

1. 1
2. 3
3. 5
4. 6

( This Answer is Correct )

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**Q 26 :** Which of the following is/are called “non-typical transition element”?

**Marks :** 1

1. Zn
2. Cd
3. Hg
4. All of these

( This Answer is Correct )

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**Q 27 :** Which of the following transition element has the maximum number of oxidation states?

**Marks :** 1

1. Zn
2. Mn
3. Hg
4. Ni

( This Answer is Correct )

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**Q 28 :** The oxidation state of Fe in Fe(CO)<sub>5</sub>

**Marks :** 1

1. 0
2. (+)5
3. (-)2
4. (+)1

( This Answer is Correct )

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**Q 29 :** The most state oxidation states of f- block elements are-

**Marks :** 1

1. (+)3
2. (+)5
3. (+)1
4. (+)2

( This Answer is Correct )

**Q 30 :** Which among the following is/ are strong oxidizing agent/agents?

**Marks :** 1

1.  $K_2Cr_2O_7$
2.  $KMnO_4$
3.  $H_2S$
4. Both a and b

( This Answer is Correct )

**Q 31 :** The chemical composition of "BROWN'S catalyst" is-

**Marks :** 1

1. Zinc sulphate
2. Chromium oxide
3. Hg
4. Nickel boride

( This Answer is Correct )

**Q 32 :** Acetamide can be converted to methenamine by which of the following reactions?

**Marks :** 1

1. Stephen's reaction
2. Hoffmann bromamide reaction
3. Carbylamine reaction
4. Gabriel phthalimide synthesis

( This Answer is Correct )

**Q 33 :** An aldehyde on reaction with primary amine forms

**Marks :** 1

1. ketone
2. Schiff's base
3. aromatic acid
4. carboxylic acid

( This Answer is Correct )

**Q 34 :** Benzene-diazonium chloride on reaction with phenol in weakly basic medium gives

**Marks :** 1

1. Diphenyl ether
2. p-hydroxyazobenzene
3. Chlorobenzene
4. Benzene

( This Answer is Correct )

**Q 35 :** Which one of the following does not contain the -COOH group?

**Marks :** 1

- 1 . Picric acid
- 2 . Aspirin
- 3 . Benzoic acid
- 4 . Ethanoic acid

( This Answer is Correct )

**Q 36 :** C<sub>3</sub>H<sub>9</sub>N can have how many structural isomers?

**Marks :** 1

- 1 . 2
- 2 . 3
- 3 . 4
- 4 . 5

( This Answer is Correct )

**Q 37 :** Products formed when Nitrobenzene reacts with HNO<sub>3</sub>/H<sub>2</sub>SO<sub>4</sub> at 80-100°C

**Marks :** 1

- 1 . 1, 4-Dinitrobenzene
- 2 . 1, 2, 4-Trinitrobenzene
- 3 . 1, 2-Dinitrobenzene
- 4 . 1, 2-Dinitrobenzene

( This Answer is Correct )

**Q 38 :** Benzene forms Nitrobenzene on reaction with conc. HNO<sub>3</sub>/H<sub>2</sub>SO<sub>4</sub>, in the reaction HNO<sub>3</sub> acts as a

**Marks :** 1

- 1 . catalyst
- 2 . reducing agent
- 3 . base
- 4 . acid

( This Answer is Correct )

**Q 39 :** When 0.1 mol CoCl<sub>3</sub>(NH<sub>3</sub>)<sub>5</sub> is combined with excess AgNO<sub>3</sub>, then 0.2 mol AgCl is obtained. The conductivity of the solution suits the

**Marks :** 1

- 1 . 1:3 electrolyte
- 2 . 1:1 electrolyte
- 3 . 3:1 electrolyte
- 4 . 1:2 electrolyte

( This Answer is Correct )

**Q 40 :** A chelating agent has two or more than two donor atoms to bind to a single metal ion. Which of the following is not a chelating agent?

**Marks :** 1

- 1 . Thiosulphato
- 2 . Oxalato
- 3 . Glycinato
- 4 . Ethane-1,2-diamine

( This Answer is Correct )

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**Q 41 :** IUPAC name of  $[\text{Pt}(\text{NH}_3)_2\text{Cl}(\text{NO}_2)]$  is **Marks :** 1

1. Platinum diamminechloronitrite
2. Chloronitrito-N-ammineplatinum (II)
- 3. Diamminechloridonitrito-N-platinum (II)**  ( This Answer is Correct )
4. Diamminechloronitrito-N-plantinate (II)

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**Q 42 :** In the complex  $[\text{E}(\text{en})_2(\text{C}_2\text{O}_4)]\text{NO}_2$  (where (en) is ethylenediamine) \_\_\_\_\_ are the coordination number and the oxidation state of the element 'E' respectively. **Marks :** 1

1. 6 and 2
2. 2 and 2
3. 4 and 3
- 4. 6 and 3**  ( This Answer is Correct )

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**Q 43 :** The sum of coordination number and oxidation number of the metal M in the complex  $[\text{M}(\text{en})_2(\text{C}_2\text{O}_4)]\text{Cl}$  (where (en) is ethylenediamine) is **Marks :** 1

- 1. 9**  ( This Answer is Correct )
2. 6
3. 7
4. 8

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**Q 44 :** Some salts containing two different metallic elements give test for only one of them in solution, such salts are **Marks :** 1

1. double salts
2. normal salts
- 3. complex salts**  ( This Answer is Correct )
4. None of these

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**Q 45 :** How many unit cells are divided equally in a face-centred cubic lattice? **Marks :** 1

1. 2
2. 4
- 3. 6**  ( This Answer is Correct )
4. 8

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**Q 46 :** A crystalline solid **Marks :** 1

- 1. changes abruptly from solid to liquid when heated**  ( This Answer is Correct )
2. has no definite melting point



- undergoes deformation of its geometry easily
- has irregular 3-dimensional arrangements.

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**Q 47 :** In a simple cubic, body-centred cubic and face-centred cubic structure, the ratio of the number of atoms present is respectively **Marks : 1**

- 8:01:06
- 1:02:04
- 4:02:01
- 4:02:03

( This Answer is Correct )

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**Q 48 :** Na and Mg crystallize in crystals of bcc and fcc form respectively and then the amount of Na and Mg atoms present in their respective crystal unit cells is: **Marks : 1**

- 4 and 2
- 9 and 14
- 14 and 9
- 2 and 4

( This Answer is Correct )

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**Q 49 :** Ferrous oxide has a cubic structure and each unit cell edge is  $5.0A_0$ . Assuming the oxide density is  $4.0g/cm^3$ , the amount of  $Fe^{2+}$  and  $O^{2-}$  ions in each unit cell will then be **Marks : 1**

- four  $Fe^{2+}$  and four  $O^{2-}$
- two  $Fe^{2+}$  and four  $O^{2-}$
- four  $Fe^{2+}$  and two  $O^{2-}$
- three  $Fe^{2+}$  and three  $O^{2-}$

( This Answer is Correct )

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**Q 50 :** Each of the following solids shows the Frenkel defect except **Marks : 1**

- ZnS
- AgBr
- AgI
- KCl

( This Answer is Correct )

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**Q 51 :** Schottky defect in a crystal is observed when **Marks : 1**

- The ion leaves its normal position and occupies an interstitial location
- the unequal number of cation and anions are missing from the lattice
- the density of the crystal increases.
- an equal number of cations and anions are missing from the lattice.

( This Answer is Correct )

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**Q 52 :** The ratio of elevation in B.P to molality of solution is known as: **Marks : 1**

1. Molar elevation constant
2. Mole elevation constant
3. Normal elevation constant
4. Molal elevation constant

( This Answer is Correct )

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**Q 53 :** The osmotic pressure of 0.020 M solutions of KI and of sucrose (C<sub>12</sub>H<sub>22</sub>O<sub>11</sub>) are 0.565 atm and 0.345 atm respectively. The Van't Hoff factor for KI is: **Marks : 1**

1. 0.63
2. 1.63
3. 1.9
4. 0.9

( This Answer is Correct )

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**Q 54 :** The value of 0.03 M Ca (OH) <sub>2</sub> required to neutralise 20 ml of 0.025 M H<sub>3</sub> PO<sub>4</sub> is **Marks : 1**

1. 25 ml
2. 50 ml
3. 40 ml
4. 55 ml

( This Answer is Correct )

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**Q 55 :** A catalyst functions by: **Marks : 1**

1. Providing a reaction path with a lower activation energy
2. Lowering the energy of the products
3. Increasing the equilibrium constant.
4. Lowering the energy of the reactants.

( This Answer is Correct )

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**Q 56 :** Rate law can be determined from balanced chemical equation if **Marks : 1**

1. Reverse reaction is involved.
2. It is an elementary reaction
3. It is a sequence of elementary reactions
4. Any of the reactants is in excess

( This Answer is Correct )

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**Q 57 :** If the initial concentration of reactant is doubled, t<sub>1/2</sub> is also doubled, the order of reaction is- **Marks : 1**

1. 0
2. 1
3. 2
4. 3

( This Answer is Correct )

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**Q 58 :** Molecularity of a chemical reaction may be

**Marks :** 1

1. Zero
2. Fraction
3. Integer
4. all of these

( This Answer is Correct )

**Q 59 :** Electrode potential of a cell is-

**Marks :** 1

1. An intensive property
2. An Extensive property
3. Both a and b
4. can't be predicted

( This Answer is Correct )

**Q 60 :** The reaction,  $3\text{ClO}^- (\text{aq}) \rightarrow \text{ClO}_3^- (\text{aq}) + 2\text{Cl}^- (\text{aq})$  is an example of-

**Marks :** 1

1. Oxidation reaction
2. Reduction reaction
3. Disproportionation reaction
4. Decomposition reaction

( This Answer is Correct )

**Q 61 :** The hydrogen electrode is dipped in a solution of pH 3 at 25°C. The potential would be (the value of  $2.303 RT/F$  is 0.059 V) -

**Marks :** 1

1. 0.177 V
2. 0.087 V
3. 0.059 V
4. -0.177 V

( This Answer is Correct )

**Q 62 :** Grignard reagent when exposed to ammonia-

**Marks :** 1

1. Gets oxidized
2. gets hydrolyzed
3. gets decomposed to give hydrocarbon
4. forms alkane

( This Answer is Correct )

**Q 63 :** The reactivity order of different halides follows the following trend on reaction with anhydrous  $\text{ZnCl}_2$  and conc.  $\text{HCl}$ -

**Marks :** 1

1.  $3\text{o} > 2\text{o} > 1\text{o}$
2.  $1\text{o} > 3\text{o} > 2\text{o}$
3.  $1\text{o} > 2\text{o} > 3\text{o}$
4.  $3\text{o} > 1\text{o} > 2\text{o}$

( This Answer is Correct )

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**Q 64 :** To prepare an unsymmetrical alkane which method is the best to operate? **Marks : 1**

1. Decarboxylation
2. Corey House  ( This Answer is Correct )
3. Wurtz reaction
4. Isomerisation

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**Q 65 :** SN2 reaction of alkyl halides lead to- **Marks : 1**

1. Retention of configuration
2. Racemisation
3. Inversion of configuration  ( This Answer is Correct )
4. None of these

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**Q 66 :** C<sub>6</sub>H<sub>6</sub>Cl<sub>6</sub> can also be recognized as **Marks : 1**

1. 666  ( This Answer is Correct )
2. 6666
3. 3636
4. 66

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**Q 67 :** Which of the following compounds is most rapidly hydrolyzed by SN1 mechanism? **Marks : 1**

1. C<sub>6</sub>H<sub>5</sub>Cl
2. CH<sub>2</sub>=CH-CH<sub>2</sub>Cl
3. (C<sub>6</sub>H<sub>5</sub>)<sub>3</sub>CCl  ( This Answer is Correct )
4. C<sub>6</sub>H<sub>5</sub>CH<sub>2</sub>Cl

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**Q 68 :** The reaction of sodium benzene sulphonate with NaOH followed by acidification gives- **Marks : 1**

1. Phenol  ( This Answer is Correct )
2. Benzoic acid
3. Benzene
4. 1,2-dihydroxy benzene

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**Q 69 :** The distinction test for primary secondary and tertiary alcohol required to react each of them is- **Marks : 1**

1. Victor Meyer's test
2. Conc. HCl and anhydrous ZnCl<sub>2</sub>
3. Conc. HCl and anhydrous CaCl<sub>2</sub>
4. Both a and b  ( This Answer is Correct )

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**Q 70 :** Alcohols of low molecular weight are- **Marks : 1**

1 . Soluble in water  ( This Answer is Correct )

2 . Soluble in water on heating

3 . Insoluble in water

4 . Insoluble in all solvents

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**Q 71 :** The factor/factors that affect the rate of a chemical reaction of an aldehyde or a ketone is / are- **Marks : 1**

1 . Electronic effect

2 . steric effect

3 . both a and b  ( This Answer is Correct )

4 . none of these

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**Q 72 :** Reduction of aldehydes and ketones into hydrocarbons using Hydrazine, KOH and under heating condition- **Marks : 1**

1 . Cope reduction

2 . Dow reduction

3 . Wolff-Kishner reduction  ( This Answer is Correct )

4 . Clemmensen reduction

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**Q 73 :** Aldehyde and ketone have same general formula for homologous series- **Marks : 1**

1 .  $C_nH_{2n}O_{2n}$

2 .  $C_nH_{2n}$

3 .  $C_nH_{2n}O$   ( This Answer is Correct )

4 .  $C_nH_{2n}O_{n+1}$

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**Q 74 :** Action of formic acid on Tollens reagents shows- **Marks : 1**

1 . Acidic nature of formic acid

2 . Basic nature of formic acid

3 . Formic acid is a reducing agent  ( This Answer is Correct )

4 . Formic acid is an oxidizing agent

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**Q 75 :** Acetic acid doesn't form acetyl chloride with- **Marks : 1**

1 .  $PCl_5$

2 .  $PCl_3$

3 .  $SOCl_2$

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( This Answer is Correct )

4 . Cl2

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**Q 76 :** Which is the correct order of decreasing acidity of lewis acids?**Marks :** 1

- 1 .  $\text{BBr}_3 > \text{BCl}_3 > \text{BF}_3$
- 2 .  $\text{BF}_3 > \text{BCl}_3 > \text{BBr}_3$
- 3 .  $\text{BCl}_3 > \text{BF}_3 > \text{BBr}_3$
- 4 .  $\text{BBr}_3 > \text{BF}_3 > \text{BCl}_3$

 ( This Answer is Correct )

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**Q 77 :** When 100 g of sucrose (Molar mass = 342) is added to 100 g of water, the vapour pressure is lowered to 0.125 mm Hg at 25°C. What is the vapour pressure of pure water at 25°C.**Marks :** 1

- 1 . 2.38 mm Hg
- 2 . 1.15 mm Hg
- 3 . 0.11 mm Hg
- 4 . 23.8 mm Hg

 ( This Answer is Correct )

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**Q 78 :**  $14\text{CH}_3\text{MgBr}$  on treatment with  $\text{CO}_2$  generates-**Marks :** 1

- 1 .  $\text{CH}_3\text{COOH}$
- 2 .  $\text{CH}_3\text{CH}_2\text{COOH}$
- 3 .  $14\text{CH}_3\text{CH}_2\text{COOH}$
- 4 .  $14\text{CH}_3\text{COOH}$

 ( This Answer is Correct )

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**Q 79 :** Which of the following reagents cannot be used to test carboxylic group?**Marks :** 1

- 1 .  $\text{NaHCO}_3$
- 2 .  $\text{FeCl}_3$
- 3 . Alcohol in presence of concentrated  $\text{H}_2\text{SO}_4$
- 4 . Ceric ammonium nitrate

 ( This Answer is Correct )

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**Q 80 :** Oxygen is not released on heating which of the compounds?**Marks :** 1

- 1 .  $(\text{NH}_4)_2\text{Cr}_2\text{O}_7$
- 2 .  $\text{K}_2\text{Cr}_2\text{O}_7$
- 3 .  $\text{Zn}(\text{ClO}_3)_2$
- 4 .  $\text{KClO}_3$

 ( This Answer is Correct )