ISC Class 12 Exam 2024

Chemistry

Match the Columns Questions

1. Match the Columns :

Q1.

Column I	**Column II**
1. Colligative property	(p) Raoult's law
2. Dilute solution	(q) Osmotic pressure
3. Cottrell's	(r) Ebullioscopic constant
4. Temperature	(s) Solutions having same osmotic pressure
5. Isotonic solution	(t) Intensive property

(a) 1-(p), 2-(t), 3-(r), 4-(s), 5-(q)

(b) 1-(t), 2-(q), 3-(s), 4-(p), 5-(r)

(c) 1-(q), 2-(p), 3-(r), 4-(t), 5-(s)

(d) 1-(r), 2-(t), 3-(q), 4-(s), 5-(p)

Ans. (c) 1-(q), 2-(p), 3-(r), 4-(t), 5-(s)

Explanation : Osmotic pressure is colligative property, dilute solution obeys Raoult's law, Cottrell's method uses ebullioscopic constant, temperature is an intensive property and isotonic solutions are solutions having same osmotic pressure.

Q2.

Column I	**Column II**
1. Dry cell	(p) Potassium hydroxide
2. Nickel-cadmium cell	(q) Aqueous H_2SO_4
3. Lead storage cell	(r) Zinc chloride

(a) 1-(r), 2-(p), 3-(q)

(b) 1-(q), 2-(r), 3-(p)

(c) 1-(p), 2-(r), 3-(q)

(d) 1-(p), 2-(q), 3-(r)

Ans. (a) 1-(r), 2-(p), 3-(q)

Explanation : The electrolyte used in dry cell, nickel-cadmium cell and leads storage cell is zinc chloride, potassium hydroxide and aqueous H_2SO_4 respectively.

Q3.

Column I	**Column II**
(i) Catalyst alters the rates of reaction	(a) cannot be fraction or zero
(ii) Molecularity	(b) proper orientation is not there always
(iii) Second half life of first order reaction	(c) by lowering the activation energy
(iv) e-EaRT	(d) is same as the first
(v) Energetically favourable reactions are sometimes	(e) total probability is one
(vi) Area under the Maxwell- Boltzmann curve is constant	(f) refers to the fraction of molecules with energy equal to or greater than activation energy.

(a) (i) – (b), (ii) – (a), (iii) – (e), (iv) – (f), (v) – (c), (vi) - (d)

(b) (i) – (c), (ii) – (a), (iii) – (d), (iv) – (f), (v) – (b), (vi) - (e)

(c) (i) – (a), (ii) – (b), (iii) – (c), (iv) – (f), (v) – (e), (vi) - (d)

(d) (i) – (c), (ii) – (a), (iii) – (d), (iv) – (f), (v) – (e), (vi) - (b)

Ans. (b) (i) – (c), (ii) – (a), (iii) – (d), (iv) – (f), (v) – (b), (vi) – (e)

Explanation :

(i) Catalyst alters the rate of reaction by lowering activation energy.

(ii) Molecularity cannot be fraction or zero. If molecularity is zero, reaction is not possible.

(iii) Second half-life of first order reaction is same as first because half-life time is temperature independent.

(iv) $e^{-Ea/RT}$ refers to the fraction of molecules with kinetic energy equal to greater than activation energy.

(v) Energetically favourable reactions are sometimes slow due to improper orientation of molecule cause some ineffective collision of molecules.

(vi) Area under the Maxwell-Boltzmann curve is constant because total probability of molecule taking part in a chemical reaction is equal to one.

Q4.

Column I	**Column II**
(a) Lanthanoid oxide	(1) Production of iron alloy
(b) Lanthanoid	(2) Television screen
(c) Misch metal	(3) Petroleum cracking
(d) Magnesium based alloy	(4) Lanthanoid metal + iron
(e) Mixed oxides of lanthanoids are employed	(5) bullets

(a) (a)-(2), (b)-(1), (c)-(4), (d)-(5), (e)-(3)

(b) (a)-(3), (b)-(4), (c)-(5), (d)-(1), (e)-(2)

(c) (a)-(5), (b)-(1), (c)-(5), (d)-(3), (e)-(4)

(d) (a)-(1), (b)-(5), (c)-(2), (d)-(4), (e)-(3)

Ans. (a) (a)-(2), (b)-(1), (c)-(4), (d)-(5), (e)-(3)

Explanation : Lanthanoid oxide is used in TV screens, Lanthanoid are used in production of iron alloy, Misch metal consists of lanthanoid metal + iron, Mischmetal is used in Mg-based alloy to produce bullets, shell and lighter flint and mixed oxides of lanthanoids are employed in petroleum cracking.

Q5.

Column A	**Column B**
1. Five unpaired electrons	Diamagnetic
2. First Lanthanoid element	Amphoteric oxide
3. Cu (I) salts	Sc^{3+}
4. Nio	An acidic oxide
5. Colourless	Scandium
6. Mn207	A basic oxide
7. ZnO	Mn^{2+}
8. Lightest transition metal	Cerium

Ans.

1. Mn^{2+}

2. Cerium

3. Diamagnetic

4. An acidic oxide

5. Sc^{3+}

6. A basic oxide

7. Amphoteric oxide

8. Scandium

Q6.

Column A	Column B
1. Zieglar Natta catalyst	Ni in presence of hydrogen
2. Haber's process	Cu_2C_{12}
3. Contact process	V205
4. Vegetable oil or ghee	Finally divided iron
5. Sandmeyer reaction	$TiC1_4$ + A1 $(CH_3)_3$

Ans.

1. $TiC1_4$ + A1 $(CH_3)_3$

2. Finally divided iron

3. V205

4. Ni in presence of hydrogen

5. Cu_2C_{12}

Q7.

Column A	Column B
1. Production of iron alloy	Lanthanoid oxide
2. Television screen	Lanthanoid
3. Petroleum cracking	Misch metal
4. Lanthanoid metal + iron	Magnesium based alloy
5. Bullets	Mixed oxides of Lanthanoid are employed

Ans.

1. Lanthanoid

2. Lanthanoid oxide

3. Mixed oxides of Lanthanoid are employed

4. Misch metal

5. Magnesium based alloy

Q8.

Column A	Column B
1. Low spin complex, d2sp3	Bidentate ligand
2. EDTA	Werner's theory
3. Coordination compounds	Hexaamine cobalt(III) ion

4. Ethylene di amine	Hexadentate

Ans.

1. Hexaamine cobalt(III) ion

2. Hexadentate

3. Werner's theory

4. Bidentate ligand

Q9.

Column A	**Column B**
1. Rhodium	Chlorophyll
2. Cobalt	Blood pigment
3. Iron	Wilkinson catalyst
4. Magnesium	Vitamin B_{12}

Ans.

1. Wilkinson catalyst

2. Vitamin B_{12}

3. Blood pigment

4. Chlorophyll

Q10.

Column I	**Column II**
1. Ammonical silver nitrate	(p) Tollen's reagent
2. DDT	(q) Insecticide
3. Freon	(r) Refrigerant
4. Iodoform	(s) Antiseptic
5. Grignard Reagent	(t) RMgX

(a) 1-(p), 2-(q), 3-(r),4-(s),5-(t)

(b) 1-(r), 2-(t), 3-(s),4-(q),5-(p)

(c) 1-(s), 2-(t), 3-(p),4-(q),5-(r)

(d) 1-(q), 2-(p), 3-(r),4-(s),5-(t)

Ans. (a) 1-(p), 2-(q), 3-(r),4-(s),5-(t)

Explanation : Ammonical silver nitrate is Tollen's reagent. DDT (dichloro diphenyl trichloroethane) is an insecticide. Freon are low toxicity gases or liquids which are generally used as refrigerants and as aerosol. Iodoform is used as an antiseptic. RMgX is a grignard reagent.

Q11.

Column I	**Column II**
1. Antifreeze used in car engine	(p) Methanol
2. Solvent used in perfumes	(q) Phenol
3. Starting material for picric acid	(r) Ethylene glycol
4. Wood spirit	(s) Ethanol

(a) 1-(s), 2-(q), 3-(r), 4-(p)

(b) 1-(s), 2-(q), 3-(p), 4-(r)

(c) 1-(p), 2-(r), 3-(q), 4-(s)

(d) 1-(r), 2-(s), 3-(q), 4-(p)

Ans. (d) 1-(r), 2-(s), 3-(q), 4-(p)

Explanation : Ethylene glycol is used as Antifreeze in car engines. Ethanol is used as solvent in perfumes. Phenol is used as starting material for picric acid. Methanol is also known as wood spirit.

Q12.

Column I	**Column II**
1. Anhydrous ZnCl2 + conc.HCl	(p) Ethyl alcohol
2. Phenol	(q) Invertase
3. Fermentation	(r) Tertiary alcohol
4. Dynamite	(s) Lucas reagent
5. Enzyme	(t) Reimer-Tiemann reaction
6. Lucas test	(u) Nitro glycerine

(a) 1-(s), 2-(t), 3-(p), 4-(u), 5-(q), 6-(r)

(b) 1-(r), 2-(u), 3-(q), 4-(t), 5-(p), 6-(s)

(c) 1-(t), 2-(s), 3-(q), 4-(r), 5-(p), 6-(u)

(d) 1-(p), 2-(q), 3-(s), 4-(r), 5-(t), 6-(u)

Ans. (a) 1-(s), 2-(t), 3-(p), 4-(u), 5-(q), 6-(r)

Explanation : Anhydrous ZnCl2 + Conc. HCl is Lucas reagent. In Reimer Tiemann reaction, phenol is converted into an ortho hydroxybenzaldehyde using chloroform. Ethyl alcohol is obtained by the fermentation of sugar or starch from agricultural crops by yeasts or bacteria. Nitroglycerin is a powerful and unstable explosive that Alfred Nobel used in his invention of dynamite. Invertase is an enzyme. Tertiary alcohols can be tested by Lucas test.

Q13.

Column I	**Column II**
1. Coupling test	(p) 100% Ethyl alcohol
2. Methylated spirit	(q) Polar
3. Power alcohol	(r) propane-1,2,3-triol
4. Glycerine	(s) Mixture of petrol and ethyl alcohol
5. O-H Bond	(t) Methyl alcohol
6. Absolute alcohol	(u) Phenol

(a) 1-(s), 2-(t), 3-(p), 4-(u), 5-(q), 6-(r)

(b) 1-(r), 2-(u), 3-(q), 4-(t), 5-(p), 6-(s)

(c) 1-(t), 2-(s), 3-(q), 4-(r), 5-(p), 6-(u)

(d) 1-(u), 2-(t), 3-(s), 4-(r), 5-(q), 6-(p)

Ans. (d) 1-(u), 2-(t), 3-(s), 4-(r), 5-(q), 6-(p)

Explanation : When benzene diazonium chloride reacts with phenol in which the phenol molecules at its para position is coupled with the diazonium salt to form p-hydroxyazobenzene. This reaction is known as coupling reaction. Methylated spirit is methyl alcohol. Power alcohol is a mixture of petrol and ethyl alcohol. The IUPAC name of glycerine is propane-1,2,3-triol and -OH bond is polar in nature. Absolute alcohol is 100% ethyl alcohol.

Q14.

Column A	**Column B**
1. HVZ reaction	Aromatic acid
2. Benzoic Acid	Reducing agent
3. Formic Acid	White Vinegar
4. Acetic Acid	Ethanoic anhydride
5. Carbamide	$NH_2–CO–NH_2$

6. Acetic Anhydride	Formalin
7. Dilute solution of formic Acid	Hell-Volhard-Zelinsky

Ans.

1. Hell-Volhard-Zelinsky

2. Aromatic acid

3. Reducing agent

4. White Vinegar

5. $NH_2–CO–NH_2$

6. Ethanoic anhydride

7. Formalin