SUB- CHEMISTRY (043)

DMAI

class – XII

★ EXPECTED QUESTIONS FOR BOARD EXAMINATION 2015-16

* All class Students are instructed to revise NCERT Text Book Part I & II sincerely.

* Revise all intext questions & NCERT Excercises for securing good marks in Board Examination.

* Written Practice of all topics is very much required.

Assignment Class - XII

EXPECTED QUESTIONS Subject - Chemistry (1)

UNIT- 5 Surface Chemistry

(1) Write the difference between physisorption and chemisorption with respect to the following -
   (i) specificity
   (ii) Temperature dependence
   (iii) Reversibility
   (iv) Enthalpy change

(2) (a) What happens when a freshly precipitated $Fe(OH)_3$ is shaken with water containing a small quantity of $FeCl_3$

(b) Why is finely divided substance more effective as an adsorbent ?

(3) Explain Freundlich adsorption isotherm.

(4) What is meant by coagulation of a colloidal solution Name any method by which coagulation of lyophobic sols can be carried out.

(5) Define the following :
   (i) Peptization
   (ii) Reversible sols

(6) What are emulsions ? State one application of emulsificati

(7) What do you mean by 'activity' and 'selectivity' of a catalyst ?

(8) Explain the following -
   (i) Artificial rain is caused by spraying salt over clouds.
   (ii) When a beam of light is passed through a colloidal sol, the path of the beam gets illuminated.
   (iii) Lyophillic colloid is more stable than lyophobic colloid.
   (iv) Sky appears blue in colour.
   (v) How are deltas formed ?
   (vi) Charcoal is used in gas masks in coal mines.
   (vii) Silica gel is placed in the atmosphere saturated with water.

(9) On the basis of Hardy Schulze rule explain why the coagulating power of Phosphate is higher than Chloride.

(10). Explain the following terms –

a. Multimolecular colloids
b. Collodion
c. Zeta potential
d. Electrophoresis
e. Critical Micelle concentration (CMC)
f. Hydrosols.
g. Shape - selective catalysis
h. Homogeneous catalysis
i Heterogeneous catalysis
j Macromolecular colloids
K. Cottrell smoke precipitator.

X

Assignment class - XII

Subject - Chemistry

(2)

EXPECTED QUESTIONS

UNIT- 6 General principles and Processes of isolation of Elements

(1). Explain the role of each of the ~~each~~ following in the extraction of metals from their ores:
(a) Co in the extraction of nickel.
(b) Zinc in the extraction of silver.
(c) Silica in the extraction of copper.

(2) Which method is used for refining Zr and Ti? Explain with Equation.

(3) Copper can be extracted by hydrometallurgy but not Zinc. Explain.

(4) What is meant by the term pyrometallurgy?

(5) What is the significance of leaching in the extraction of aluminium?

(6) What is the role of depressant in froth floatation Process?

(7) Describe the role of following -
(a) NaCN in the extraction of gold from gold ore
(b) Cryolite in the metallurgy of aluminium.
(c) graphite rod in the electrolytic reduction of alumina
(d) Iodine in the refining of Zirconium.

(8). Why is Zinc not extracted from Zinc oxide through reduction using CO?

(9). Explain the method used for removing gangue from sulphide ore.

(10) Write all the chemical reactions take place in the blast furnace,

Assignment Class – XII

EXPECTED QUESTIONS Subject- Chemistry (3)

UNIT-7 - The p-Block Elements

(1) How would you account for the following –

(a) Sulphur in vapour state exhibits paramagnetic behaviour.

(b) The stability of +3 state increases down the group in group 15 of the periodic table.

(c) H_2S is less acidic than H_2Te.

(d) Nitrogen does not form pentahalides.

(e) Phosphorus has a greater tendency for catenation than nitrogen.

(f) H_2O is a liquid while, H_2S is a gas.

(g) Iron dissolves in HCl to form $FeCl_2$ and not $FeCl_3$.

(h) Helium is used in diving equipment.

(i) Ammonia is more basic than phosphine.

(j) The two O–O bond lengths in ozone (O_3) molecule are same.

(2) Describe the favourable conditions for the manufacture of

(a) ammonia by Haber's process

(b) Sulphuric acid by contact Process

(3) What happens when –

(a) Chlorine gas is passed through a hot concentrated solution of NaOH ?

(b) Sulphur dioxide gas is passed through an aqueous solution of a Fe (III) salt ?

(c) XeF_4 undergoes hydrolysis.

(d) H_3PO_3 is heated.

(4) Draw the structures –

(a) XeF_2 (b) $HClO_4$ (c) H_2SO_5 (d) BrF_3 (e) XeO_3

(f) XeF_4 (g) $H_2S_2O_8$ (h) HClO (i) IF_7 (j) $HClO_3$

(5) Why does PCl_3 fume in moisture ?

(6) Complete the following Chemical equations –

a. $NH_4Cl_{(aq)} + NaNO_{2(aq)} \longrightarrow$

b. $I_2 + HNO_3(conc) \longrightarrow$

c. $Ca(OH)_2 + HCl \longrightarrow$

d. $XeF_6 + 3H_2O \longrightarrow$

e. $P_4 + SO_2Cl_2 \longrightarrow$

(7) How is O_3 estimated quantitatively ?

(8) Give reason with chemical equation for bleaching action of Cl_2.

(9) What inspired N. Bartlett for carrying out reaction between Xe and Pt F_6 ?

(10) Give two examples to show the effect of concentration of nitric acid on the formation of oxidation product.

(11) Write the reactions involved in the formation of brown ring.

(12) Explain why ozone is thermodynamically less stable than oxygen.

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ASSIGNMENT CLASS – XII

EXPECTED QUESTIONS SUBJECT – CHEMISTRY (4)

P-BLOCK ELEMENTS

GROUP – 15

(1) Why are pentahalides more covalent than trihalides?

(2) Why is BiH_3 the strongest reducing agent amongst all the hydrides of Group 15 elements?

(3) PH_3 has lower boiling point than NH_3. Why?

(4) Write the reaction of thermal decomposition of sodium azide.

(5) Why is N_2 less reactive at room temperature?

(6) Why does NH_3 act as a Lewis base?

(7) Mention the conditions required to maximise the yield of NH_3.

(8) How does NH_3 react with a solution of Cu^{2+}?

(9) What is the covalence of nitrogen in N_2O_5?

(10) Name two oxoacids of nitrogen.

(11) Explain Brown Ring Test with chemical equations.

(12) Bond angle in PH_4^+ is higher than that in PH_3. Why?

(13) How can you prove that PH_3 is basic in nature?

(14) Why does PCl_3 fume in moisture?

(15) Are all the five bonds in PCl_5 molecule equivalent? Justify your answer.

(16) What happens when PCl_5 is heated?

(17) What is the basicity of H_3PO_4?

(18) Account for the reducing behaviour of H_3PO_2 on the basis of its structure.

(19) Why does NH_3 form hydrogen bond but PH_3 does not?

EXPECTED QUESTIONS

(20) Why does $R_3P=O$ exist but $R_3N=O$ does not ? (5)

(21) Nitrogen exists as diatomic molecule and phosphorous as P_4. Why ?

(22) Give the disproportionation reaction of H_3PO_3 and HNO_2.

(23) Draw the structures — H_3PO_4, $H_4P_2O_7$, H_3PO_3, H_3PO_2, N_2O_5

(24) Complete the following

a. $Ca_3P_2 + H_2O \longrightarrow$

b. $P_4 + HNO_3$ (conc.) $\longrightarrow$

c. $Cu + HNO_3$ (conc.) $\longrightarrow$

d. $H_3PO_3 \xrightarrow{\Delta}$

e. $P_4 + NaOH + H_2O \longrightarrow$

f. $PCl_5 \xrightarrow{\Delta}$

g. $PH_3 + HgCl_2 \longrightarrow$

h. $I_2 + HNO_3$ (conc.) $\longrightarrow$

i. $Zn + HNO_3$ (dil.) $\longrightarrow$

j. $Cu + HNO_3$ (dil.) $\longrightarrow$

K. $NH_4NO_3 \xrightarrow{\Delta}$

l. $PCl_3 + H_2O \longrightarrow$

m. $CuSO_4 + PH_3 \longrightarrow$

n. $S_8 + HNO_3 \longrightarrow$

(25) Give reason —

(i) Nitric oxide becomes brown when released in air.

(ii) Solid phosphorus pentachloride exhibits some ionic character.

(iii) Ammonia acts as a ligand.

(iv) PF_5 is known but NF_5 is not known.

(v) White phosphorus is more reactive than red phosphorus.

(vi) Nitric oxide paramagnetic in gaseous state but the solid obtained on cooling it is diamagnetic.

Assignment class - XII

EXPECTED QUESTIONS

subject - Chemistry

(6)

UNIT 8 - The d- and f block Elements

(1) what are interstitial compounds ? Why are such compounds well known for transition metals ?

(2) Describe the oxidising action of $K_2Cr_2O_7$ and write the ionic equations for its reaction with

(a) iodide (b) iron(II) solution (c) H_2S

(3) Explain giving reason -

(a) Transition metals and many of their compounds show Paramagnetic behaviour.

(b) The enthalpies of atomisation of the transition metals are high.

(c) The transition metals generally form coloured compound

(d) Transition metals and their many compounds are good catalyst.

(4) Cu(I) ion is not stable in an aqueous solution. Explain with the help of Equation.

(5) What is lanthanoid contraction ? what are the consequences of lanthanoid contraction ?

(6) Why are Cr^{2+} reducing and Mn^{3+} oxidising when both have d^4 configuration ?

(7) Describe the preparation of

(a) Potassium dichromate from sodium Chromate

(b) $KMnO_4$ from K_2MnO_4

(8) Compare the actinoids with that of lanthanoids with special reference to —

(a) Electronic configuration

(b) Oxidation state

(c) atomic and ionic size

(d) Chemical reactivity.

(9) (a) The Chemistry of actinoids is not so smooth as that of lanthanoids.

(b) On what ground can you say that scandium ($Z = 21$) is a transition element but zinc ($Z = 30$) is not ?

(10) Complete the following chemical equations →

(a) $MnO_4^- + C_2O_4^{2-} + H^+ \longrightarrow$

(b) $Cr_2O_7^{--} + 14H^+ + 6I^- \longrightarrow$

(c) $CrO_4^{2-} + 2H^+ \longrightarrow$ ____

(d) $MnO_4^- + SO_3^{--} + 6H^+ \longrightarrow$

(e) $Cr_2O_7^{--} + 2OH^- \longrightarrow$

(f) $2MnO_4^- + 3Mn^{2+} + H_2O \longrightarrow$

(11) Draw the structures-

(a) Manganate ion

(b) Permanganate ion

(c) Chromate ion

(d) Dichromate ion

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EXPECTED QUESTIONS **d & f block Elements** (7)

Q1 (a) Write general electronic configuration of
(i) d block elements (ii) 3d series elements
(iii) f-block elements (iv) Lanthanoids (v) Actinoids.

(b) Write electronic configuration of following ions & also calculate magnetic moment in each case-
(i) Cr^{+3} (ii) Mn^{+3} (iii) Ce^{+4} (iv) Cu(II) (v) Fe(III)

Q2 What is meant by disproportionation? Give two example.

Q3 Assign reasons for each of the following-
a) Transition metals generally form coloured compounds.
b) Zn, Cd & Hg normally are not regarded as transition metals.
c) transition metals have high enthalpy of atomisation.
d) transition elements & their compounds can act as good catalyst.

Q4 How does acidified permanganate react with -
(i) Fe(II) ions (ii) oxalic acid. Write the ionic equations for the reaction.

Q5 (i) Name the element of 3d transition series which shows maximum number of oxidation states.
(ii) out of Cr^{+3} & Mn^{+3}, which is a stronger oxidising agent & why?
(iii) $[Ti(H_2O)]^{+3}$ is coloured while $[Sc(H_2O)_6]^{+3}$ is colourless.

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EXPECTED QUESTIONS

1- Compare the chemistry of actinoids with that of lanthanoids with special reference to:

(i) electronic configuration (ii) oxidation states

(iii) atomic and Ionic sizes (iv) chemical reactivity.

2, Write the electronic configurations of the elements with atomic numbers 61, 91, 101 and 109.

3. How would you account for the following:

(i) There is greater range of oxidation states among the lanthanoids.

(ii) The metallic radii of the third (5d) series of transition elements are virtually the same as those of the corresponding members of the second series.

(iii) $K_2[PtCl_4]$ is a well-known compound whereas the corresponding Ni compound is not known.

(iv) La, Gd, and Lu are extraordinarily stable in +3 oxidation state.

(v) Actinoids exhibit a much larger number of oxidation states than the lanthanoids.

(vi) The enthalpies of atomisation of transition metals are quite high.

(vii) The transition metal generally form coloured complexes.

4. When a brown compound of manganese (A) is treated with HCl it gives a gas (B). The gas taken in excess, reacts with NH_3 to give an explosive compound (C). Identify compounds A and B.

5. Give reasons for the following:

(i) $[Ti(H_2O)]^{3+}$ is coloured while $[Sc(H_2O)_6]^{3+}$ is colourless.

(ii) E° value for the Mn^{3+}/Mn^{2+} couple is much more positive than that of Cr^{3+}/Cr^{2+}

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EXPECTED QUESTIONS

Q:1- How do you prepare:

(i) K_2MnO_4 from MnO_2 ?

(ii) $Na_2Cr_2O_7$ from Na_2CrO_4 ?

Q:2- Explain the following observations:

(i) Colour of $KMnO_4$ disappears when oxalic acid is added to its solution in acidic medium.

(ii) A green solution of potassium manganate turns purple when CO_2 gas is passed through the solution.

Q:3 (a) A blackish brown coloured solid 'A' when fused with alkali metal hydroxides in presence of air, produces a dark green coloured compound 'B', which on electrolytic oxidation in alkaline medium gives a dark purple coloured compound C. Identify A, B and C. Also write the reactions involved.

(b) What happen when an acidic solution of the green compound (B) is allowed to stand for some time? Give the equations involved. What is the type of reaction called.

Q. 4- Describe the preparation of Potassium permanganate. Write the ionic equations for its reaction with (i) nitrite (ii) sulphite (ii) Ferrous ion.

Q. 5 - Describe the preparation of potassium dichromate. Write the ionic equations for its reaction with (i) iodide (ii) H_2S (iii) Ferrous Ion.

Class-XII Subject : Chemistry

ASSIGNMENT NO-1

classmate Date Page

EXPECTED QUESTIONS

COORDINATION COMPOUNDS (Unit-9) 10

(A) Write IUPAC name of :

1. $K_3[Fe(C_2O_4)_3]$
2. $[Pt(NH_3)_3NO^3Cl_2]Br_2$
3. $[Ni(H_2O)_6]Cl_2$
4. $[CoCl_2(NH_3)_6]Cl$
5. $[PtCl_2(NH_3)_2]$
6. $K_4[Mn(CN)_4]$
7. $[Co(NH_3)_5Cl]Cl_2$
8. $K_2[Ni(CN)_4]$
9. $[Co(NH_3)_4(H_2O)_2]Cl_3$
10. $[Co(NH_3)_2Cl_2en]^+$
11. $K_3[Fe(CN)_6]$
12. $[Co(en)_3]^{3+}$
13. $K[Cr(H_2O)_2(C_2O_4)_2]$
14. $[Co(NH_3)_5(NO_2)](NO_3)_2$
15. $[Co(en)_3].Cl_3$

(B) Write the formulae for the following co-ordination compounds :

1. Potassium tetrahydroxozincate (II)
2. Potassium Trioxalatoaluminiate (III)
3. Tetra carbonyl nickel (0)
4. Tetra ammineaquachlorido cobalt (III) chloride
5. Dichloridobis (ethane-1,2 diamine) cobalt (III)
6. Ammine bromido chlorido nitrito-N-Platinate (II)
7. Iron (III) hexacyanoferrate (II)
8. Potassium tetrachloridopalladate (II)
9. Hexaammine platinum (IV)
10. Cis-dichlorido tetracyanochromate (III)
11. Hexamethyl dialuminium
12. Tetrabromido cuprate (II)
13. Pentaammine nitrito-O-cobalt (III)
14. Pentaammine nitrito-N-Cobalt (III)
15. Cis-Platin

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d & f block Elements

(11)

EXPECTED QUESTIONS

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Assignment Class XII

Subject - Chemistry

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EXPECTED QUESTIONS UNIT-9 – Coordination Compounds

(1) Define (a) Double salt
(b) Ligand
(c) Coordination Number
(d) Coordination sphere
(e) Counter ion
(f) Denticity
(g) Unidentate ligand
(h) Didentate ligand
(i) Chelate
(j) Ambidentate ligand
(k) coordination polyhedra
(l) EDTA

(2). Write IUPAC names →

$K_3[Fe(C_2O_4)_3]$, $[Pt(NH_3)_3(NO)Cl_2]Br_2$

$[Co(CN)_2(NH_3)_4]Cl$ $[Cr(NH_3)_5(NCS)][ZnCl_4]$

(3) write ionisation isomer of $[Co(NH_3)_5Br]SO_4$

(4) $[Fe(H_2O)_6]^{3+}$ is strongly Paramagnetic whereass $[Fe(CN)_6]^{3-}$ is weakly Paramagnetic & Explain.

(5) Describe the following ions, the type of hybridization, shape and magnetic property:

(i) $[Co(NH_3)_6]^{3+}$ (ii) $[NiCl_4]^{2-}$ (iii) $[Fe(H_2O)_6]^{2+}$

(6) What is crystal field splitting energy? How does the magnitude of Δ_o decide the actual configuration of d-orbitals in a coordination entity?

(7) Draw the structures of optical isomers of

(a) $[Cr(C_2O_4)_3]^{3-}$ (b) $[PtCl_2(en)_2]^{2+}$

(c) $[Cr(NH_3)_2Cl_2(en)]^{+}$.

(8) Illustrate with an example each —

(i) Linkage isomerism

(ii) Coordination isomerism.

(9) Give the electronic configuration of the following complexes on the basis of Crystal field splitting theory -

$[CoF_6]^{3-}$ $[Fe(CN)_6]^{4-}$ $[Cu(NH_3)_6]^{2+}$

(10) Draw the energy level diagram of Crystal field splitting in — octahedral complexes

— Tetrahedral complexes

(11) Using Valence bond theory, explain the following in relation to the complexes given as follows-

$[Mn(CN)_6]^{3-}$ $[Fe(U_6)]^{4-}$

$[Co(NH_3)_6]^{3+}$

$[Cr(H_2O)_6]^{3+}$

(i) Type of hybridisation

(ii) Inner or outer orbital complex

(iii) Magnetic behaviour

(iv) spin only magnetic moment value.

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EXPECTED QUESTIONS

Co-ordination compounds-

Q1 Write down the number of 3d electrons in each of the following ions -
Ti^{+2}, V^{+2}, Cr^{+3}, Ni^{+2}, Cu^{+2}

Q2 Co^{+2} is readily oxidised to Co^{+3} in presence of a strong ligand. Explain.

Q3 Draw structures of geometrical isomers of $[Fe(NH_3)_2(CN)_4]^-$

Q4 Out of the following two co-ordination entities which is chiral (optically active)? & why?
(a) cis-$[CrCl_2(ox)_2]^{-3}$ (b) trans-$[CrCl_2(ox)_2]^{-3}$.

Q5 Discuss the nature of bonding in metal carbonyls.

Q6. Predict the number of unpaired electrons in the square planar $[Pt(CN)_4]^{2-}$ ion.

Q7 Amongst the following ions which one has the highest magnetic moment value?
(i) $[Cr(H_2O)_6]^{3+}$ (ii) $[Fe(H_2O)_6]^{2+}$ (iii) $[Zn(H_2O)_6]^{2+}$

Q8 Name a (i) neutral bidentate ligand.
(ii) negatively charged bidentate ligand
(iii) hexadentate ligand.

Co-ordination Compounds

(14)

EXPECTED QUESTIONS

Q1 What is meant by crystal field splitting energy? On the basis of crystal field theory, write the electronic configuration of d^4 in terms of t_{2g} & e_g in an octahedral field when

(i) $\Delta_o > P$ (ii) $\Delta_o < P$

Q2(a) What is the basis of formation of spectrochemical series?

(b) Draw figure to show the splitting of d-orbitals in an octahedral crystal field.

Q3 Deduce the type of hybridisation of the central atom in (i) $Ni(CO)_4$ (ii) $[Ni(CN)_4]^{-2}$ (iii) $[NiCl_4]^{-2}$

Also deduce the shape and magnetic behaviour of these complexes.

Q4. Explain $[Co(NH_3)_6]^{+3}$ is an inner orbital complex whereas $[Ni(NH_3)_6]^{+2}$ is an outer orbital complex.

Q5 Give an example of each of the following:-

(i) Linkage isomerism

(ii) Co-ordination isomerism

(iii) Ionisation Isomerism.

Q6 Write the IUPAC name of the linkage isomer of $[Co(NH_3)_5 - NO_2]Cl_2$.

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EXPECTED QUESTIONS

Write Short Note on following Name Reactions:

1) Wurtz Reaction
2) Wittig Reaction
3) Wurtz Wittig Reaction
4) Diazotisation
5) Sandmayer's Reaction
6) Swarts Reaction
7) Finkelstein Reaction
8) Friedel craft Alkylation
9) Friedel craft acetylation
10) Carbylamine Reaction
11) Riemer Tiemann Reaction
12) Kolbe's Reaction
13) Gattermann Reaction
14) Gattermann koch Reaction
15) Etard's Reaction
16) Cannizaro's Reaction
17) Aldol condensation
18) Cross Aldol condensation
19) Clemmenson Reduction
20) Wolf Krishner Reduction
21) Rosenmund Reaction
22) HVZ Reaction
23) Tollen's Test
24) Fehling solution's test
25) Hinsberg's test
26) Stephan Reaction
27) coupling Reaction
28) Hoffman Bromamide Degradation Reaction
29) Gabriel Phthalimide Reaction
30) Esterification
31) Dow's process.
32) Haloform Reaction
33) Ammonolysis.
34) Williamson Synthesis
35) Lucas test

EXPECTED QUESTIONS — Assignment - 2 — Class - XII (Chemistry)

Q.1. How will you distinguish between following compounds:

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(i) Methyl alcohol and Ethyl alcohol

(ii) Phenol and Methanol

(iii) 1-Propanol and 2-methyl-2-propanol

(iv) Phenol and Benzoic acid

(v) acetic acid and formic acid

(vi) formaldehyde and acetaldehyde

(vii) Benzoic acid and Phenol

(viii) Propanal and propanone

(ix) Acetophenone and Benzophenone

(x) Benzoic acid and Ethyl Benzoate

(xi) Benzaldehyde and acetophenone

(xii) Pentan-2-one and pentan-3-one

(xiii) Ethyl amine and diethylamine

(xiv) propyl alcohol and Isopropyl alcohol

(xv) Primary amine & sec. Amine.

(xvi) Primary, sec. & tertiary amine.

(xvii) Primary, sec. & tertiary alcohol

(xviii) Aniline and Benzylamine

(xix) Phenol and Benzyl alcohol

(xx) Chloro benzene and benzyl chloride.

Assignment No - 3

Class - XII
(Chemistry)

17

EXPECTED QUESTIONS

How will you convert:

(i) Propene into propan-2-ol

(ii) Benzyl Chloride into Benzyl alcohol

(iii) Ethyl magnesium Bromide into tertiary Butyl alcohol.

(iv) Propanone to propene

(v) Ethanol to 3-Hydroxybutanal

(vi) Benzoic acid to Benzaldehyde.

(vii) Bromobenzene to 1-Phenyl ethanol

(viii) Benzaldehyde to Benzophenone.

(ix) Nitrobenzene to Benzoic acid

(x) Benzene to m-bromophenol

(xi) Benzoic acid to aniline

(xii) Aniline to 2,4,6 tribromoaniline

(xiii) Aniline to Benzyl alcohol

(xiv) ethanoic acid into methanamine

(xv) Hexanenitrile into 1-amino pentane

(xvi) ethylamine into methyl amine

(xvii) Propanoic acid to ~~me~~ethanoic acid

(xviii) methyl amine into ethyl amine

(xix) methyl Alcohol into ethyl alcohol

(xx) methyl Chloride into ethyl Chloride.

EXPECTED QUESTIONS

Assignment No-4

(18)

Class-XII (Chemistry)

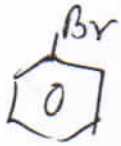
Give the structure of A, B, and C in the following conversions' (Also write IUPAC Names of all products)

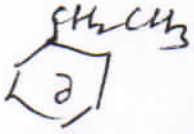
(i) $C_6H_5N_2Cl \xrightarrow{CuCN} A \xrightarrow{H_2O/H^+} B \xrightarrow[\Delta]{NH_3} C$

(ii) $CH_3COOH \xrightarrow{\Delta/NH_3} A \xrightarrow{NaOBr} B \xrightarrow{NaNO_2/HCl} C$

(iii) $C_6H_5NO_2 \xrightarrow{Fe/HCl} A \xrightarrow[273K]{HNO_2} B \xrightarrow{C_6H_5OH} C$

(iv) $C_6H_5CH_2Cl \xrightarrow{NH_3} A \xrightarrow{CH_3Cl} B \xrightarrow{CH_3Cl} C$

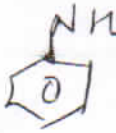
(v)  $\xrightarrow{Mg} A \xrightarrow{CO_2} B \xrightarrow{HOH} C$

(vi)  $\xrightarrow{KMnO_4-KOH} A \xrightarrow{H_2O} B \xrightarrow[Conc.H_2SO_4]{Conc.HNO_3} C$

(vii) $R\text{-}X \xrightarrow{KCN} A \xrightarrow{HOH/H^+} B \xrightarrow{H^+/HOH} C$

(viii) $\xrightarrow{CHCl_3+aq.NaOH} A \xrightarrow{H^+} B \xrightarrow[H^+]{CH_3COCl} C$

(ix) $\xrightarrow{CH_3CH=CH_2} A \xrightarrow{O_2} B \xrightarrow[H_2O]{H^+} C + CH_3COCH_3$

(x)  $\xrightarrow[0-5^\circ C]{NaNO_2/HCl} A \xrightarrow[Warm]{H_2O} B \xrightarrow{Br_2\ water} C$

(xi) $2\,CH_3CHO \xrightarrow{dil\ NaOH} A \xrightarrow[-H_2O]{\Delta} B \xrightarrow{HBr} C$

(xii) $\xrightarrow[Anhyd.\ AlCl_3]{CH_3Cl} A \xrightarrow[CS_2]{CrO_2Cl_2} B \xrightarrow{H_3O^+} C$