Roll No. : _____

Objective
Paper Code
**8485**

**Intermediate Part Second**

# CHEMISTRY ( Objective ) GROUP - I

Time: 20 Minutes Marks: 17

**Q.No.1** **You have four choices for each objective type question as A, B, C and D. The choice which you think is correct, fill the relevant circle in front of that question number on computerized answer sheet. Use marker or pen to fill the circles. Cutting or filling two or more circles will result in zero marks in that question. Attempt as many questions as given in objective type question paper and leave other circles blank.**

| S.# | Questions | A | B | C | D |
|---|---|---|---|---|---|
| 1 | Which acid can be used as a catalyst in Friedel-Crafts reactions? | $HNO_3$ | $BeC\ell_2$ | $A\ell C\ell_3$ | $H_2SO_4$ |
| 2 | The presence of a double bond in a compound is the sign of: | Saturation | Unsaturation | Substitution | Elimination |
| 3 | Which set of hybrid orbitals has planar triangular shape: | $sp^2$ | $sp^3$ | sp | $dsp^2$ |
| 4 | The colour of transition metal complexes is due to: | Paramagnetic nature of element | Ionization | Loss of S-electron | d-d transition of electrons |
| 5 | Bleaching powder may be produced by passing chlorine over: | Calcium carbonate | Hydrated calcium sulphate | Calcium hydroxide | Magnesium hydroxide |
| 6 | Nitric oxide forms a brown coloured addition compound with $FeSO_4$. This test is used to confirm the presence of: | Carbonates | Phosphates | Nitrates | Sulphates |
| 7 | Which element forms an ion with charge +3? | Beryllium | Aluminum | Carbon | Silicon |
| 8 | Which ion will have the maximum value of heat of hydration? | $Na^+$ | $Cs^{+1}$ | $Ba^{+2}$ | $Mg^{+2}$ |
| 9 | Sodium reacts with excess of oxygen and forms: | Sub oxide | Normal oxide | Peroxide | Super oxide |
| 10 | The pH range of the acid rain is: | 7 – 6.5 | 6.5 – 6 | 6 – 5.6 | Less than 5 |
| 11 | In purification of potable water the coagulant used is: | Nickel sulphate | Copper sulphate | Barium sulphate | Alum |
| 12 | Phosphorous helps in the growth of: | Root | Leaves | Stem | Seed |
| 13 | Which polymer is an addition polymer? | Nylon-6,6 | Polystyrene | Terylene | Epoxy resin |
| 14 | Which acid is used in the manufacturing of synthetic fiber? | Formic acid | Oxalic acid | Carbonic acid | Acetic acid |
| 15 | Which will have the highest boiling point? | Mathanal | Ethanal | Propanal | 2-Hexanone |
| 16 | Which compound shows hydrogen bonding? | $C_2H_5OH$ | $C_2H_4$ | $C_2H_5C\ell$ | $CH_3$-O-$CH_3$ |
| 17 | For which mechanism, the first step involved is the same: | E1 and E2 | E2 and $S_N2$ | $S_N1$ and E2 | E1 and $S_N1$ |

**Intermediate Part Second** Roll No. _____

# CHEMISTRY ( Subjective ) GROUP - I

Time: 02:40 Hours Marks: 68

## SECTION – I

2. **Write short answers to any EIGHT parts.** 16



(i) Give two chemical reactions of ZnO which prove its amphoteric character.
(ii) Alkali metals give ionic hydrides. Give justification for the statement.
(iii) What happens when gypsum is strongly heated?
(iv) What is lime mortar?
(v) Why do $K_2CrO_4$ and $K_2Cr_2O_7$ show similar properties in aqueous solution?
(vi) Transition elements show variable oxidation state. Give reason.
(vii) What is β-elimination reaction? Give one example.
(viii) How would you prepare n-butane and ethane from ethyl chloride?
(ix) What is thermoplastic polymer? Give two examples.
(x) What is denaturation of proteins? Give one example.
(xi) Mention two points of difference between DNA and RNA.
(xii) What is requirement for a compound to be used as a fertilizer?

3. **Write short answers to any EIGHT parts.** 16

(i) Define the "Ring Test" for the confirmation of the presence of nitrate ions in the solution.
(ii) Why is $SO_3$ dissolved in $H_2SO_4$ and not in water?
(iii) Write four uses of bleaching powder.
(iv) Why HF is weaker acid than $HC\ell$?
(v) Define functional group. Give the functional group of ether and carboxylic acid.
(vi) Define Tauto merism. Give an example.
(vii) How is ethyne prepared on industrial scale?
(viii) How is Raney Nickel prepared? Give its one use.
(ix) Convert ethene into ethyl alcohol.
(x) How is ozone damaged in stratosphere by chlorofluorocarbons (CFCs)?
(xi) Differentiate between primary and secondary pollutants.
(xii) How does acid rain affect environment?

4. **Write short answers to any SIX parts.** 12

(i) What are silicates? How sodium silicate is prepared?
(ii) What is boric acid? How it is prepared in laboratory?
(iii) Why are liquid silicones preferred over ordinary organic lubricants?
(iv) Why nitration of toluene is faster than benzene?
(v) How will you distinguish between methanol and ethanol?
(vi) Describe the term esterification using ethyl alcohol as an example.
(vii) How will you distinguish between acetone and ethyl alcohol?
(viii) How would you convert acetic acid into acetamide?
(ix) What is peptide bond? Write the formula of a dipeptide.

## SECTION – II Attempt any THREE questions. Each question carries 08 marks.

5. (a) What are metals? Give their properties with examples. 01,03
(b) What are two major problems in diaphragm cell? How they are solved? 02,02

6. (a) What is disproportionation reaction? Explain reactions of chlorine with cold and hot NaOH. 01,03
(b) Describe digestion and pulp washing in neutral sulphite semi-chemical process. 02,02

7. (a) Explain the reforming of petroleum with suitable example. 04
(b) Differentiate between $E_2$ and $E_1$ reactions mechanism. 04

8. (a) How can you prepare the following from ethyne:
(i) Acetaldehyde (ii) Vinyl acetylene (iii) Glyoxal (iv) Acetonitrile 01,01,01,01
(b) How ethanal can react with following:
(i) HCN (ii) $NaHSO_3$ (iii) $I_2$/NaOH (iv) $NaBH_4$ 01,01,01,01

9. (a) What is resonance and discuss structure of benzene by resonance method? 04
(b) Explain following terms using ethyl alcohol as an example:
(i) Esterification (ii) Ether formation (iii) Oxidation (iv) Dehydration 04

Roll No. : _____

Objective
Paper Code
**8488**

**Intermediate Part Second**

# CHEMISTRY ( Objective ) GROUP - II

Time: 20 Minutes Marks: 17

**Q.No.1** You have four choices for each objective type question as A, B, C and D. The choice which you think is correct, fill the relevant circle in front of that question number on computerized answer sheet. Use marker or pen to fill the circles. Cutting or filling two or more circles will result in zero marks in that question. Attempt as many questions as given in objective type question paper and leave other circles blank.

| S.# | Questions | A | B | C | D |
|---|---|---|---|---|---|
| 1 | The electrophile in aromatic sulphonation is: | $H_2SO_4$ | $HSO_4^-$ | $SO_3$ ● | $SO_3^+$ |
| 2 | When cyanogen chloride ($C\ell - CN$) is made to react with ethyl magnesium bromide the product formed is: | $CH_3 - CN$ | $CH_3 - CH_2 - CN$ ● | $CH_3 - CH_2 - CH_2 - CN$ | $CH_2 = CH - CN$ |
| 3 | Which compound will have the maximum repulsion with water? | $C_6H_6$ ● | $C_2H_5OH$ | $CH_3CH_2CH_2 - OH$ | $CH_3 - O - CH_3$ |
| 4 | It will have the highest boiling point: | Mathanal | Ethanal | Propanal | 2-Hexanone ● |
| 5 | Which reagent is used to reduce a carboxylic group to an alcohol? | $H_2$ / Ni | $H_2$ / Pt | $NaBH_4$ | $LiA\ell H_4$ ● |
| 6 | Nitrogeneous bases is not present in RNA: | Cytosine | Adenine | Thiamine ● | Uracil |
| 7 | Phosphorus helps the growth of: | Root | Leave | Stem | Seed ● |
| 8 | Methane has a mean residence time in atmosphere about: | 3 – 7 years ● | 4 – 7 years | 5 – 7 years | 6 – 7 years |
| 9 | Newspaper can be recycled again and again by how many times? | 2 | 3 | 4 | 5 ● |
| 10 | Select the two normal elements are present in seventh period: | Rb , Sr | Cs , Ba | Fr , Ra ● | La , Hf |
| 11 | It does not belong to alkaline earth metals: | Be | Ra | Ba | Rn ● |
| 12 | The chief ore of aluminum is: | $Na_3A\ell F_6$ | $A\ell_2O_3 \cdot 2H_2O$ ● | $A\ell_2O_3$ | $A\ell_2O_3 \cdot H_2O$ |
| 13 | Birkeland-Eyde process used for the preparation of: | $HNO_3$ ● | $H_2SO_4$ | $C_6H_6$ | HCHO |
| 14 | The anhydride of $HC\ell O_4$ is: | $C\ell O_3$ | $C\ell O_2$ | $C\ell_2O_5$ | $C\ell_2O_7$ ● |
| 15 | It is a typical transition metal: | Sc | Y | Co ● | Ra |
| 16 | Linear shape is associated with which set of hybrid orbitals? | sp ● | $sp^2$ | $sp^3$ | $dsp^2$ |
| 17 | Synthetic rubber is made by polymerization of: | Chloroform | Acetylene | Divinyl acetylene | Chloroprene ● |

Intermediate Part Second Roll No. _____

# CHEMISTRY ( Subjective ) GROUP - II

Time: 02:40 Hours Marks: 68 Faisalabad Board-2024

## SECTION – I

**Write short answers to any EIGHT parts.** 16

(i) What is the difference between acidic and basic oxides? Give one example of each.
(ii) Carbon and hydrogen possess reducing properties. Show with equations.
(iii) Decomposition of lithium nitrate gives different products than the nitrates of other alkali metals. Why? Give reaction.
(iv) Give brief description of alkali and alkaline earth metal sulphates solubility in water.
(v) How is $K_2CrO_4$ converted into $K_2Cr_2O_7$? Show with reaction.
(vi) How is chromyl chloride obtained from potassium dichromate? Give reaction.
(vii) How is ethene prepared by $E_2$ elimination reaction?
(viii) Give reaction for the preparation of 1-Butanol from Grignard reagent.
(ix) What is the difference between isomerases and ligases?
(x) Give reaction for the formation of soap from triglyceride.
(xi) Give brief description of the rancidity of fats.
(xii) Give names of the nitrogeneous fertilizers.

3. **Write short answers to any EIGHT parts.** 16

(i) How does $PC\ell_5$ react with water?
(ii) Write names and formulas of any two sulphide ores of Sulphur.
(iii) Give chemical reactions of $H_2SO_4$ with $NaC\ell$ and $NaBr$.
(iv) What is available chlorine?
(v) Define isomerism. Write two isomers of butane.
(vi) How was coal formed from wood under the Earth?
(vii) Write common name and structural formula of 1-methyl propene.
(viii) What is incomplete oxidation of $CH_4$?
(ix) Give structural formulae of the compounds: (i) Potassium maleate (ii) Disodium succinate
(x) How is mustard gas prepared from ethene?
(xi) What are primary pollutants? Give two examples.
(xii) What is leachate?

4. **Write short answers to any SIX parts.** 12

(i) How is $H_3BO_3$ prepared from (i) Borax (ii) Colemanite
(ii) Write four uses of borax.
(iii) Why are the liquid silicones preferred over the ordinary organic lubricants?
(iv) How is ethyl benzene prepared by Wurtz-Fitting reaction?
(v) How are the phenols prepared by Dow's method?
(vi) Describe the term esterification using ethyl alcohol as an example.
(vii) Define silver mirror test. Give the reaction involved.
(viii) How is acetic acid converted into (i) Methane (ii) Acetic anhydride
(ix) What is Zwitter ion? Give its structural formula.

## SECTION – II Attempt any THREE questions. Each question carries 08 marks.

5. (a) Discuss position of hydrogen at the top of IA group. Give similarities and dissimilarities. 04
(b) Describe the manufacture of NaOH by diaphragm cell. 04

6. (a) What are disproportionation reaction? How does NaOH react with $C\ell_2$ in hot and cold state? 01,03
(b) What is meant by setting of cement? Explain the reaction taking place in first 24 hours of setting of cement. 01,03

7. (a) Write notes on: (i) Catalytic cracking (ii) Steam cracking 02,02
(b) What do you understand by the term β-elimination reaction? Explain E-1 mechanism in detail. 01,03

8. (a) How will you synthesize the following compounds starting from ethyne?
(i) Acrylonitrile (ii) Acetaldehyde (iii) Glyoxal (iv) Methyl nitrile 04
(b) What is Cannizzaro's reaction? Describe its mechanism and prepare methanol and formic acid by this reaction. 04

9. (a) Discuss atomic orbital treatment of benzene in detail. 04
(b) Describe two reactions of each in which C-O and O-H bonds of alcohol are broken. 02,02

# Faisalabad Board-2023

Roll No. : _____

Objective
Paper Code
**8483**

**Intermediate Part Second - 136**

## CHEMISTRY ( Objective ) GROUP - I

Time: 20 Minutes Marks: 17

**Q.No.1** **You have four choices for each objective type question as A, B, C and D. The choice which you think is correct, fill the relevant circle in front of that question number on computerized answer sheet. Use marker or pen to fill the circles. Cutting or filling two or more circles will result in zero marks in that question. Attempt as many questions as given in objective type question paper and leave other circles blank.acf**

| S.# | Questions | A | B | C | D |
|---|---|---|---|---|---|
| 1 | The main water pollutant chromium-VI is discharged by: | Plastic industry | Paper industry | Leather industry | Cement industry |
| 2 | Urea contains: | 36% nitrogen | 46% nitrogen | 56% nitrogen | 66% nitrogen |
| 3 | Polyamide resins are: | Homopolymer | Copolymer | Terpolymer | Addition polymer |
| 4 | Compounds having $-C \equiv N$ group are called: | Nitro compound | Amino acid | Alkane nitriles | Amide |
| 5 | During reduction of aldehyde with $NaBH_4$, $H^-$ ion act as: | Electrophile | Nucleophile | Acid | Base |
| 6 | Which enzyme is not involved in fermentation of starch? | Diastase | Zymase | Urease | Maltase |
| 7 | Carbolic acid has another name of: | Alcohol | Phenol | Ether | Carboxylic acid |
| 8 | Which is not a nucleophile? | $H_2O$ | $H_2S$ | $BF_3$ | $NH_3$ |
| 9 | The electrophile in aromatic sulphonation is: | $H_2SO_4$ | $HSO_4^{-1}$ | $SO_3$ | $SO_3^+$ |
| 10 | β-β′-dichloroethyl sulphide is known as: | Mustard gas | Laughing gas | Phosgene gas | Bio gas |
| 11 | A double bond consists of: | Two sigma bonds | One sigma and one pi bond | One sigma and two pi bond | Two pi bond |
| 12 | The colour of transition metal complexes is due to: | d-d transition of electrons | Ionization | Loss of s-electron | Gain of s-electron |
| 13 | Bleaching powder is prepared by passing chlorine over: | Calcium carbonate | Calcium sulphate | Calcium hydroxide | Magnesium hydroxide |
| 14 | Catalyst used in contact process is: | $Fe_2O_3$ | $V_2O_5$ | $SO_3$ | $Ag_2O$ |
| 15 | The chief ore of aluminum is: | $Na_3A\ell F_6$ | $A\ell_2O_3 \cdot 2H_2O$ | $A\ell_2O_3$ | $A\ell_2O_3 \cdot H_2O$ |
| 16 | The mineral $CaSO_4 \cdot 2H_2O$ has the general name: | Gypsum | Dolomite | Calcite | Epsom salt |
| 17 | Melting point of halogens: | Decrease down the group | Increase down the group | Remains same in group | First increase and then down the group |

**Intermediate Part Second** Roll No. _____

# CHEMISTRY ( Subjective ) GROUP - I

Time: 02:40 Hours Marks: 68

## SECTION – I

2. **Write short answers to any EIGHT parts.** 16
   (i) How will you convert boric acid into borax and vice versa?
   (ii) Write the chemical formula of these minerals: (a) borax (b) Colemanite
   (iii) What are the common properties of group IVA elements? (any four)
   (iv) What is Wurtz-fitting reaction?
   (v) How is glyoxal produced from benzene?
   (vi) Define aromatic compounds with two examples.
   (vii) What is condensation polymerization?
   (viii) How can you differentiate between glucose and fructose?
   (ix) Write any four uses of lipids?
   (x) What is dissolved oxygen?
   (xi) How do $CO_2$ and $SO_2$ cause acid rain?
   (xii) How do pesticides affect living organism?

3. **Write short answers to any EIGHT parts.** 16
   (i) Write the functional group of alkanone and alkanoic acid with one example in each case.
   (ii) What do you know about functional group isomerism? Give one example.
   (iii) Give structural formula of alkene expected to be formed by dehydrohalogenation of 1-chloropentane.
   (iv) Starting from ethene prepare ethyne.
   (v) How is acetylene converted into chloroprene?
   (vi) How does Grignard reagent react with methanal?
   (vii) Starting from ethyl chloride prepare (a) n-butane (b) ethane.
   (viii) Write the names of woody raw materials of paper industry.
   (ix) What are the four essential qualities of a good fertilizer?
   (x) Write the allotropic forms of phosphorus.
   (xi) Write reaction taking place in contact tower for the manufacturing sulphuric acid.
   (xii) Write the ring test for the confirmation of nitrate ion in solution.

4. **Write short answers to any SIX parts.** 12
   (i) What are ligands? Give one example.
   (ii) Draw the geometry of $PCl_5$.
   (iii) What is chromyl chloride test?
   (iv) Define fermentation. Give one example.
   (v) What is Lucas Test?
   (vi) Why phenol is acidic but alcohol is not?
   (vii) Give mechanism of addition of $NH_3$ with acetone.
   (viii) What is iodoform test? Give its use.
   (ix) What are amino acids? Give their general formula.

## SECTION – II Attempt any THREE questions. Each question carries 08 marks.

5. (a) Discuss the position of hydrogen with group I-A elements. 04
   (b) Write a detailed note on the commercial preparation of sodium by Down's cell. 04

6. (a) Write eight applications of noble gases. 04
   (b) Describe the process of digestion in paper industry. 04

7. (a) Explain any four features of organic compounds. 04
   (b) Explain the structure of benzene on the basis of molecular orbital treatment. 04

8. (a) Convert: (i) Ethyne into oxalic acid (ii) Propyne into acetone 02,02
   (b) What are alkyl halides? How alkyl halides are prepared from alcohol by three different reactions. 01,03

9. (a) How does acetaldehyde react with the following reagents? 01,01,01,01
   (i) $C_2H_5MgI$ (ii) HCN (iii) $NaHSO_3$ (iv) dil NaOH
   (b) Discuss two methods of preparation of α-amino acids. 04

I-BD-12-2-23

Roll No. : _____

Objective
Paper Code
**8486**

**Intermediate Part Second - 301**

# CHEMISTRY ( Objective ) GROUP - II

Time: 20 Minutes Marks: 17

**Q.No.1** **You have four choices for each objective type question as A, B, C and D. The choice which you think is correct, fill the relevant circle in front of that question number on computerized answer sheet. Use marker or pen to fill the circles. Cutting or filling two or more circles will result in zero marks in that question. Attempt as many questions as given in objective type question paper and leave other circles blank.coa**

| S.# | Questions | A | B | C | D |
|---|---|---|---|---|---|
| 1 | Formula of chloroform is: | $CH_3C\ell$ | $CC\ell_4$ | $CH_2C\ell_2$ | $CHC\ell_3$ |
| 2 | Linear shape is associated with which set of hybrid orbitals? | sp | $sp^2$ | $sp^3$ | $dsp^2$ |
| 3 | Group VI-B of transition elements contains: | Zn, Cd, Hg | Fe, Ru, Os | Cr, Mo, W | Mn, Te, Re |
| 4 | Which one of these hydrogen halides is the weakest acid in solution? | HF | HBr | HI | $HC\ell$ |
| 5 | One of the catalyst used in contact process: | $Fe_2O_3$ | $V_2O_5$ | $SO_3$ | $Ag_2O$ |
| 6 | The chief ore of aluminum is: | $Na_3A\ell F_6$ | $A\ell_2O_3 \cdot 2H_2O$ | $A\ell_2O_3$ | $A\ell_2O_3 \cdot H_2O$ |
| 7 | The oxide of beryllium is: | Acidic | Basic | Amphoteric | Composite |
| 8 | Keeping in view the size of atoms, which order is the correct one? | Mg > Sr | Ba > Mg | Lu > Ce | $C\ell > I$ |
| 9 | The normal amount of overhead ozone is about: | 350 DU | 250 DU | 150 DU | 50 DU |
| 10 | Percentage composition of silica in cement is: | 62 | 22 | 7.5 | 2.5 |
| 11 | Succinic thiokinase is an example of: | Ligases | Lyases | Hydrolases | Isomerases |
| 12 | Flavour of amyl butyrate (Ester) is: | Orange | Apricot | Jasmine | Banana |
| 13 | The colour of precipitate of aldehyde with Fehling's solution is: | Black | White | Blue | Brick red |
| 14 | Rectified spirit contains ethyl alcohol about: | 80% | 85% | 90% | 95% |
| 15 | Ethanol can be converted into ethanoic acid by: | Hydrogenation | Hydration | Oxidation | Fermentation |
| 16 | Which is not a nucleophile? | $H_2O$ | $H_2S$ | $BF_3$ | $NH_3$ |
| 17 | The electrophile in aromatic sulphonation is: | $H_2SO_4$ | $HSO_4^-$ | $SO_3$ | $SO_3^+$ |

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Intermediate Part Secon· Roll No. __ _____

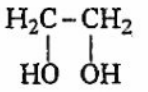
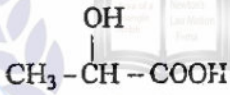
# CHEMISTRY ( Subjective ) GROUP - II

Time: 02:40 Hours Marks: 68

## SECTION – I

2. **Write short answers to any EIGHT parts.** 16
   (i) Why $CO_2$ is gas but $SiO_2$ is a solid?
   (ii) Write four uses of borax.
   (iii) What is meant by chemical garden?
   (iv) Prepare glyoxal from benzene.
   (v) Give the structural formulae of (a) Benzoic acid (b) Acetophenone
   (vi) Write objections to Kekule formula of benzene.
   (vii) What are thermoplastic polymers? Give two examples.
   (viii) Give two points of difference between RNA and DNA.
   (ix) How is PVC prepared? Give its uses.
   (x) What are primary and secondary pollutants?
   (xi) How is water pollution caused by the detergents?
   (xii) What is dissolved oxygen?

3. **Write short answers to any EIGHT parts.** 16
   (i) Explain reforming of petroleum with the help of a suitable example.
   (ii) Define functional group. Give two examples of oxygen containing functional groups.
   (iii) Write structural formulae of these compounds: (a) 2,5-heptadiene (b) 1,3-pentadiene
   (iv) How can you chemically distinguish between propene and propyne?
   (v) Write the structural formula of the product formed when 1-butene reacts with $Br_2$ in $CC\ell_4$.
   (vi) Give reactions of $HNO_3$ with reducing agents (a) $FeSO_4$ (b) $H_2S$
   (vii) How does concentrated $H_2SO_4$ react with (a) Copper (b) Ag. Give reactions.
   (viii) How does NO react with $H_2S$ and $H_2SO_3$ ?
   (ix) Write reaction of ethyl magnesium chloride with cyanogen chloride.
   (x) Give preparation of Grignard reagent in the presence of dry ether.
   (xi) How is potassium nitrate prepared on industrial scale?
   (xii) What products are formed in the pre-heating zone and decomposition zone of rotary kiln in cement industry?

4. **Write short answers to any SIX parts.** 12
   (i) $KMnO_4$ acts as oxidizing agents. Give reaction.
   (ii) Why does damaged tin plated iron get rusted quickly?
   (iii) Under what conditions does aluminium corrode?
   (iv) Give IUPAC names: (i)  (ii) 
   (v) Why and how alcohol is denatured?
   (vi) How are ethers prepared by Williamsons synthesis?
   (vii) How will you distinguish between methanal and ethanal by chemical reaction?
   (viii) Give reaction of HCHO with $NaBH_4$
   (ix) What is ninhydrin test?

## SECTION – II Attempt any THREE questions. Each question carries 08 marks.

5. (a) What are oxides? Discuss their classification on the basis of acidic and basic character. 01,03
   (b) What is the role of gypsum in industry? 04

6. (a) Write any eight applications of noble gases. 04
   (b) What is neutral sulphite semi-chemical process? Explain its bleaching unit. 04

7. (a) What is cracking? Discuss its types. 01,03
   (b) Discuss Friedel-Crafts alkylation reaction of benzene with mechanism. 04

8. (a) Write any four methods for preparation of alkanes. 04
   (b) Write any four methods for preparation of alkyl halides from alcohols. 04

9. (a) Starting from aldehyde prepare: (i) Oxime (ii) Hydrazone (iii) Iodoform (iv) Cyanohydrin 04
   (b) What types of reactions are shown by carboxylic acids? Describe any three reactions involving hydrogen atom of carboxylic acid group. 04

Roll No. : _____

Objective Paper Code **8487**

**Intermediate Part Second - 103**

# CHEMISTRY ( Objective ) GROUP - I

Time: 20 Minutes Marks: 17

**Q.No.1** **You have four choices for each objective type question as A, B, C and D. The choice which you think is correct, fill the relevant circle in front of that question number on computerized answer sheet. Use marker or pen to fill the circles. Cutting or filling two or more circles will result in zero marks in that question. Attempt as many questions as given in objective type question paper and leave other circles blank.coa**

| S.# | Questions | A | B | C | D |
|---|---|---|---|---|---|
| 1 | During nitration of benzene, the active nitrating agent is: | $NO_2$ | $HNO_3$ | NO | $NO_2^+$ |
| 2 | For which Mechanism, the first step involved is the same? | E1 and E2 | E2 and $S_N2$ | $S_N1$ and E2 | E1 and $S_N1$ |
| 3 | Which enzyme is not involved in fermentation of starch? | Diastase | Zymase | Urease | Invertase |
| 4 | Cannizzaro's reaction is not given by: | Acetaldehyde | Formaldehyde | Benzaldehyde | Trimethyl acetaldehyde |
| 5 | Acetic acid was first isolated from: | Milk | Vinegar | Butter | Red ant |
| 6 | Which is an addition polymer? | Nylon 6-6 | Terylene | Polystyrene | Epoxy resin |
| 7 | Phosphorus helps the growth of: | Root | Leave | Stem | Seed |
| 8 | The pH range of the acid rain is: | 7 – 6.5 | 6.5 – 6 | 6 – 5.6 | Less than 5 |
| 9 | Half of the atmospheric mass is concentrated in the lower: | 5.6 km | 10.6 km | 15.6 km | 20.6 km |
| 10 | Among alkali metal ions, minimum hydration energy is shown by: | $Li^+$ | $Na^+$ | $Rb^+$ | $K^+$ |
| 11 | The oxide of beryllium is: | Acidic | Basic | Neutral | Amphoteric |
| 12 | Which element is not present abundantly in earth's crust? | Si | A$\ell$ | Na | O |
| 13 | Which catalyst is used to contact process? | $V_2O_5$ | $Fe_2O_3$ | $SO_3$ | $Ag_2O$ |
| 14 | Chlorine heptaoxide ($C\ell_2O_7$) reacts with water to form: | Hypochlorous acid | Chloric acid | Perchloric acid | Chlorine and oxygen |
| 15 | Coordination number of Pt in $[Pt\ C\ell(NO_2)(NH_3)_4]$ is: | 02 | 04 | 01 | 06 |
| 16 | Which set of hybrid orbitals has planar triangular shape? | $sp^2$ | $sp^3$ | sp | $dsp^2$ |
| 17 | Vinyl acetylene combines with HC$\ell$ to form: | Poly acetylene | Chloroprene | Benzene | Divinyl acetylene |

Intermediate Part Second

Roll No. _____

# CHEMISTRY ( Subjective ) GROUP - I



Time: 02:40 Hours Marks: 68

## SECTION – I

2. **Write short answers to any EIGHT parts.** 16



(i) Why the size of cation is smaller than that of parent atom?
(ii) ZnO oxide is amphoteric oxide. Justify with two reactions.
(iii) Write any two uses of gypsum in industry.
(iv) Write two major problems during manufacturing of NaOH in diaphragm cell.
(v) Write four uses of borax.
(vi) Why are liquid silicones preferred over ordinary organic lubricants?
(vii) Write any four uses of $H_2SO_4$.
(viii) Write four similarities of oxygen and sulphur.
(ix) Why does damaged tin plated iron get rusted quickly?
(x) What is sacrificial corrosion?
(xi) What are fertilizers? Why they are needed?
(xii) Write any four essential qualities of good fertilizer.

3. **Write short answers to any EIGHT parts.** 16

(i) Why iodine has metallic luster?
(ii) Give any four uses of bleaching powder.
(iii) Define functional group and give two examples.
(iv) What is metamerism? Give example.
(v) What is Clemmensen reduction? Give one example.
(vi) How is mustard gas prepared? Give its use.
(vii) How does ethyne react with water in the presence of $HgSO_4/H_2SO_4$
(viii) Write a method for preparation of ethyl magnesium bromide in laboratory.
(ix) What are β-eliminations reactions?
(x) Differentiate between conjugated and derived proteins.
(xi) Write structure of cholesterol.
(xii) Give two difference between DNA and RNA.



4. **Write short answers to any SIX parts.** 12

(i) What happens when $C\ell_2$ is passed through benzene in sunlight?
(ii) Convert benzene into glyoxal.
(iii) Give IUPAC name: (a) $CH_3-CH(OH)COOH$ (b) $CH_2(OH)-CH_2(OH)$
(iv) Define fermentation. Give its necessary conditions.
(v) Convert ethanal into ethanol.
(vi) What are Zwitter ions? Give example.
(vii) What is glacial acetic acid? Why is it called so?
(viii) How acid rain affects our environment? Briefly discuss.
(ix) What are leachates? Briefly explain.



## SECTION – II

Attempt any THREE questions. Each question carries 08 marks.

5. (a) Discuss the position of hydrogen on top of group IA. (four similarities and four differences) 04
(b) Write applications of aluminium. (any eight) 04

6. (a) Write the formulas of these minerals: (i) Dolomite (ii) Asbestos (iii) Epsom salt (iv) Sylvite 04
(b) Define corrosion. Explain electrochemical theory of corrosion. 04

7. (a) What is orbital hybridization? Explain structure of ethane on the basis of $sp^3$-hybridization? 04
(b) Explain mechanism of $S_N1$ reactions with a suitable example. 04

8. (a) Describe the Kolbe's electrolytic method for the preparation of alkenes along with mechanism. 04
(b) Explain Cannizzaro's reaction with the help of mechanism of formaldehyde. 04

9. (a) What are Friedel craft alkylation reaction? Give its mechanism. 04
(b) Give the reaction of phenol with: (i) $HNO_3$ (ii) $H_2SO_4$ (iii) $CH_3COC\ell$ (iv) $Br_2$ water 04

Roll No. : _____

Objective

Intermediate Part Second - 103

Paper Code **8482**

# CHEMISTRY ( Objective ) GROUP - II

Time: 20 Minutes Marks: 17 FRD-9-2-22

**Q.No.1** **You have four choices for each objective type question as A, B, C and D. The choice which you think is correct, fill the relevant circle in front of that question number on computerized answer sheet. Use marker or pen to fill the circles. Cutting or filling two or more circles will result in zero marks in that question. Attempt as many questions as given in objective type question paper and leave other circles blank.coa**

| S.# | Questions | A | B | C | D |
|---|---|---|---|---|---|
| 1 | Keeping in view the size of atoms, which order is the correct? | Mg > Sr | Ba > Mg | Lu > Ce | $C\ell > I$ |
| 2 | Which does not belong to alkaline earth metals? | Be | Ra | Ba | Rn |
| 3 | Which metal is used in the thermite process because of its activity? | Iron | Copper | Aluminium | Zinc |
| 4 | Laughing gas is chemically: | NO | $N_2O$ | $NO_2$ | $N_2O_4$ |
| 5 | The anhydride of $HC\ell O_4$ is: | $C\ell O_3$ | $C\ell O_2$ | $C\ell_2O_5$ | $C\ell_2O_7$ |
| 6 | Coordination number of Pt in $[Pt\ C\ell(NO_2)(NH_3)_4]$ is: | 2 | 4 | 1 | 6 |
| 7 | A double bond consists of: | Two sigma bonds | One sigma and one pi bond | One sigma and two pi bonds | Two pi bonds |
| 8 | Vinyl acetylene combines with $HC\ell$ to form: | Poly acetylene | Benzene | Chloroprene | Divinyl acetylene |
| 9 | Benzene cannot undergo: | Substitution reaction | Addition reaction | Oxidation reaction | Elimination reaction |
| 10 | $S_N2$ reactions can be best carried out with: | Primary alkyl halides | Secondary alkyl halides | Tertiary alkyl halides | All these |
| 11 | Which enzyme is not involved in fermentation of starch? | Diastase | Zymase | Urease | Invertase |
| 12 | Cannizzaro's reaction is not given by: | Formaldehyde | Acetaldehyde | Benzaldehyde | Trimethyl acetaldehyde |
| 13 | Which reagent is used to reduce a carboxylic group to an alcohol? | $H_2/Ni$ | $H_2/Pt$ | $NaBH_4$ | $LiA\ell H_4$ |
| 14 | A polymeric substance that is formed in the liquid state and then hardened to a rigid solid is called a: | Fiber | Plastic | Varnish | Polyamide resin |
| 15 | Phosphorous helps the growth of: | Root | Leave | Stem | Seed |
| 16 | Fungicides are the pesticides which: | Control the growth of fungus | Kill insects | Kill plants | Kill herbs |
| 17 | In purification of potable water the coagulant used is: | Nickle sulphate | Copper sulphate | Barium sulphate | Alum |

312-XII132021-5000

Inte id Roll No. _____

# CHEMISTRY ( Subjective ) GROUP II

Time: 02:40 Hours Marks: 68 FBD-G2

## SECTION – I



2. **Write short answers to any EIGHT parts.** 16
   (i) Why metallic character increases from top to bottom in a group of metals?
   (ii) What are polymeric halides? Give example.
   (iii) How is lime mortar prepared?
   (iv) Why is the aqueous solution of $Na_2CO_3$ alkaline in nature?
   (v) How will you convert boric acid into borax and vice versa?
   (vi) Why $CO_2$ is non-polar in nature?
   (vii) What is meant by Fuming nitric acid?
   (viii) $NO_2$ is a strong oxidizing agent. Prove the truth of this statement giving examples.
   (ix) Why does damaged tin plated iron get rusted quickly?
   (x) What are chelates? Give example.
   (xi) Describe prilling of urea.
   (xii) What do you mean by setting of cement?

3. **Write short answers to any EIGHT parts.** 16
   (i) How $C\ell O_2$ is prepared? Give its reaction.
   (ii) What are freons and teflons? Give their importance.
   (iii) Define homologous series. Also give two examples.
   (iv) Why do ethers and ketones show metamerism? Justify.
   (v) Write structural formula of (a) vinyl bromide (b) 3-n-propyl-1, 4-pentadiene.
   (vi) How will you prepare propene from isopropyl chloride?
   (vii) Identify "A and B" : $CH_3CH_2CH_2OH \xrightarrow{PC\ell_5} A \xrightarrow{Na/Ether} B$
   (viii) Convert methane into methanol.
   (ix) Discuss the reactivity of alkyl halides.
   (x) What is saponification number? Give saponification number of tripalmitate.
   (xi) Explain the classes of enzymes with one example in each (a) isomerase (b) lyases.
   (xii) Discuss the specificity of enzymes.

4. **Write short answers to any SIX parts.** 12
   (i) How is m-chloronitrobenzene prepared from benzene?
   (ii) Define resonance. Give one example.
   (iii) How ethanol reacts with Conc $\cdot H_2SO_4$ at different temperatures?
   (iv) Write note on Lucas test.
   (v) How will you distinguish between butanone and 3-pentanone?
   (vi) Write four uses of acetic acid.
   (vii) Define essential and non-essential amino acids.
   (viii) What are leachates?
   (ix) Define oxidizing and reducing smog.

## SECTION – II

Attempt any THREE questions. Each question carries 08 marks.

5. (a) What is ionization energy? Give an example. How does it vary in group and periods? 04
   (b) Write eight uses of borax. 04

6. (a) Compare the chemical behaviour of lithium with magnesium. (any four points) 04
   (b) Describe the following properties of transition metals (i) Alloy formation (ii) Paramagnetism. 04

7. (a) Define sp-hybridization. Explain the structure of ethyne on the basis of sp-hybridization. 04
   (b) Explain nucleophilic substitution bimolecular reaction. ($S_N2$) 04

8. (a) Explain the acidic character of alkynes with two examples. 04
   (b) What is Cannizzaro's reaction? Explain with mechanism. 04

9. (a) Explain the terms with reference to alcohols: (i) Dehydration (ii) Oxidation 04
   (b) Explain the rules for nomenclature of monocyclic aromatic hydrocarbons and their derivatives. (any four) 04

Roll No. : _____

Objective
Paper Code
**8483**

**Intermediate Part Second**

# CHEMISTRY (Objective) GROUP - I

Time: 20 Minutes Marks: 17

**Q.No.1** **You have four choices for each objective type question as A, B, C and D. The choice which you think is correct, fill the relevant circle in front of that question number on computerized answer sheet. Use marker or pen to fill the circles. Cutting or filling two or more circles will result in zero marks in that question. Attempt as many questions as given in objective type question paper and leave other circles blank.**

| S.# | Questions | A | B | C | D |
|---|---|---|---|---|---|
| 1 | During the manufacturing process of cement the temperature of decomposition zone goes up to: | 600°C | 900°C | 1000°C | 1200°C |
| 2 | Carboxylic acids on reduction with HI and red phosphorus gives: | Alkanes | Alcohols | Aldehydes | Ketones |
| 3 | Which acid is used in the manufacture of synthetic fiber? | Formic acid | Oxalic acid | Carbonic acid | Acetic acid |
| 4 | The compound used in the processing of anti-polio vaccine is: | Acetaldehyde | Formaldehyde | Acetone | Ethylbromide |
| 5 | Formalin is _____ solution of Formaldehyde in water. | 10% | 20% | 40% | 60% |
| 6 | Which compound will have maximum repulsion with $H_2O$? | $C_6H_6$ | $C_2H_5OH$ | $CH_3CH_2CH_2OH$ | $CH_3-O-CH_3$ |
| 7 | Which is not a nucleophile? | $H_2O$ | $H_2S$ | $BF_3$ | $NH_3$ |
| 8 | The electrophile in aromatic sulphonation is: | $H_2SO_4$ | $HSO_4^-$ | $SO_3$ | $SO_3^+$ |
| 9 | Formula of chloroform is: | $CH_3C\ell$ | $CC\ell_4$ | $CH_2C\ell_2$ | $CHC\ell_3$ |
| 10 | A double bond consists of: | Two sigma bonds | One sigma and one pi bond | One sigma and two pi bonds | Two pi bonds |
| 11 | The colour of transition metal complexes is due to: | d-d transition of electrons | Paramagnetic nature of transition elements | Ionization | Loss of S-electrons |
| 12 | The anhydride of $HC\ell O_4$ is: | $C\ell O_3$ | $C\ell O_2$ | $C\ell_2O_5$ | $C\ell_2O_7$ |
| 13 | Which halogen is a solid at room temperature and pressure? | $F_2$ | $C\ell_2$ | $Br_2$ | $I_2$ |
| 14 | Among group VA elements, the most electronegative element is: | Sb | N | P | As |
| 15 | Tincal is a mineral of: | $A\ell$ | B | Si | C |
| 16 | Chile Saltpeter has the chemical formula: | $NaNO_3$ | $KNO_3$ | $Na_2B_4O_7$ | $Na_2CO_3 \cdot H_2O$ |
| 17 | Mark the correct statement: | Metallic character increases down the group | Metallic character increases from left to right along a period | Metallic character remains the same from left to right along a period | Metallic character remains the same down the group |

# CHEMISTRY ( Subjective ) GROUP - I

Time: 02:40 Hours Marks: 68 F&D-41-21

## SECTION – I



2. **Write short answers to any EIGHT parts.** 16
   (i) Why anionic radius is greater than parent atom?
   (ii) Diamond is a non-conductor while graphite is a good conductor. Give reason.
   (iii) Complete and balance the equations: (a) $LiNO_3 \xrightarrow{heat}$ (b) $NaNO_3 \xrightarrow{heat}$
   (iv) Describe two problems during manufacturing of NaOH by diaphragm cell.
   (v) Convert Boric acid into tetra boric acid.
   (vi) Write the reaction of $H_3BO_3$ with (a) NaOH (b) $Na_2CO_3$
   (vii) Write any two uses of boric acid.
   (viii) Write two methods for preparation of nitrogen oxide (NO).
   (ix) Write any two reactions of $H_2SO_4$ as an oxidizing agent.
   (x) How diammonium phosphate is prepared?
   (xi) Define cement.
   (xii) Which types of raw material is used in cement? Give their names.

3. **Write short answers to any EIGHT parts.** 16
   (i) Write equations for the reactions of chlorine with hot and cold NaOH.
   (ii) Give four uses of bleaching powder.
   (iii) Arrange the oxy acids of halogen in increasing order of their acidic strength.
   (iv) What is sacrificial corrosion?
   (v) What are interstitial compounds?
   (vi) Write mechanism for nitration of benzene.
   (vii) Convert benzene into (a) Hexachlorocyclohexane (b) Benzene sulphonic acid.
   (viii) What is Tollen's test?
   (ix) Write general mechanism for the acid catalysed nucleophilic addition reactions of carbonyl compounds.
   (x) Write four uses of acetic acid.
   (xi) Convert acetic acid into (a) Ethane (b) Ethyl alcohol.
   (xii) Write structural formulae of (a) Malonic acid (b) Phthalic acid.

4. **Write short answers to any SIX parts.** 12
   (i) Define heterocyclic compounds and give two examples with names.
   (ii) What is metamerism? Give one example.
   (iii) Write the structural formulas for these compounds. (a) 3-n-propyl-1, 4-pentadiene (b) But-1-en-3-yne
   (iv) How will you convert? (a) Ethene into ethyl alcohol (b) Ethene into ethyne.
   (v) Define Markownikov's rule and give one example.
   (vi) Define allyl halide, which is the best method of preparing allyl halide.
   (vii) Give IUPAC names of following compounds:
   (a) $(C_2H_5)_2CH-CH_2-\underset{\underset{Cl}{|}}{CH}-CH_3$ (b) $(CH_3)_2CH-CH_2-CH(C_2H_5)CH_2Cl$
   (viii) How phenol is prepared from sodium salt of benzene sulphonic acid?
   (ix) Give uses of ethanol. Only four.

## SECTION – II Attempt any THREE questions. Each question carries 08 marks.

5. (a) Describe variation of melting point and boiling point in periods and groups of modern periodic table. 04
   (b) Describe peculiar behaviour of Be. 04

6. (a) Write preparation and two reactions of $HNO_2$. 04
   (b) Write a note on these properties of transition elements: (i) Binding energies (ii) Oxidation state 04

7. (a) Explain geometrical isomerism with suitable examples. 04
   (b) What is Cannizzaro's reaction? Explain with mechanism. 04

8. (a) Describe any four methods for the preparation of alkenes. 04
   (b) What is B-Elimination reaction? Explain $E_2$ reaction in detail. 04

9. (a) What are Friedel and Craft's reactions? Give one example in each case with mechanism. 04
   (b) How will you obtain pure ethanol by fermentation of starch. 04

Roll No. : _____

Objective

Paper Code **8488**

**Intermediate Part Second**

# CHEMISTRY (Objective) GROUP - II

Time: 20 Minutes Marks: 17

**Q.No.1** **You have four choices for each objective type question as A, B, C and D. The choice which you think is correct, fill the relevant circle in front of that question number on computerized answer sheet. Use marker or pen to fill the circles. Cutting or filling two or more circles will result in zero marks in that question. Attempt as many questions as given in objective type question paper and leave other circles blank.**

| S.# | Questions | A | B | C | D |
|---|---|---|---|---|---|
| 1 | Preparation of vegetable ghee involves: | Halogenation | Hydrogenation | Hydroxylation | Dehydrogenation |
| 2 | Which is meta-directing group? | – OH | $-NH_2$ | $-NO_2$ | $-C\ell$ |
| 3 | For which mechanism, first step involved is same? | $E_1$ and $E_2$ | $E_2$ and $SN_2$ | $E_1$ and $SN_1$ | $SN_1$ and $E_2$ |
| 4 | Ethanol can be converted into ethanoic acid by: | Hydrogenation | Oxidation | Hydration | Halogenation |
| 5 | The homologous series of both aldehydes and ketones have the general formula: | $C_nH_{2n}O_2$ | $C_nH_{2n+2}$ | $C_nH_{2n}O$ | $C_nH_{2n-2}$ |
| 6 | Formalin is _____ solution of Formaldehyde in water. | 10% | 20% | 40% | 60% |
| 7 | Alkane nitrile can be converted into carboxylic acids by: | Hydration | Acidic hydrolysis | Hydrogenation | Oxidation |
| 8 | Which reagent is used to covert a carboxylic acid to an alcohol? | $H_2$ / Ni | $H_2$ / Pt | $NaBH_4$ | $LiAlH_4$ |
| 9 | All the nitrogen fertilizers except _____ make the soil acidic. | Calcium nitrate | Ammonium nitrate | Potassium nitrate | All these |
| 10 | Ionization energy of calcium is lower than _____ element. | Strontium | Magnesium | Barium | Sodium |
| 11 | Which compound is added in Down's cell to lower the melting point of sodium chloride? | $CaSO_4$ | $CaC\ell_2$ | $Ca(NO_3)_2$ | $Na_2CO_3$ |
| 12 | Boric acid cannot be used: | As antiseptic in medicine | For washing eyes | In soda bottles | For enamels and glazing |
| 13 | Nitric acid does not react with all metals given, except: | Gold | Platinum | Magnesium | Iridium |
| 14 | Chlorine heptoxide ($C\ell_2O_7$) reacts with water to form: | Hypochlorous acid | Chloric acid | Perchloric acid | Chlorine and oxygen |
| 15 | $C\ell^-$ cannot oxidize: | $F^-$ | $Br^-$ | $I^-$ | Na-metal |
| 16 | The colour of $[Ti(H_2O)_6]^{3+}$ ion is: | Red | Yellow | Violet | Green |
| 17 | Fredrick Wholer synthesized urea by heating: | $NH_4C\ell$ | $(NH_4)_2CO_3$ | $NH_4CNO$ | $NH_3$ |

# CHEMISTRY ( Subjective ) GROUP - II

Time: 02:40 Hours Marks: 68 FBD-62-21



## SECTION – I

2. **Write short answers to any EIGHT parts.** 16

(i) The oxidation states vary in a period but remain almost constant in a group. Why?

(ii) The hydration energies of the ions are in the following order $A\ell^{3+} > Mg^{2+} > Na^{+}$. Justify.

(iii) Write the names and chemical formulas of important minerals of sodium.

(iv) What happens when (a) Lithium carbonate is heated (b) Lithium hydroxide is heated to red hot?

(v) How borax can be converted into orthoboric acid?

(vi) Why nitric acid is frequently transported in Aluminium containers?

(vii) Write the names and chemical formulas of four important boric acids.

(viii) How does nitrogen differ from other elements of its group?

(ix) Write the equation for the reaction between conc $\cdot H_2SO_4$ and copper and explain what type of reaction is it?

(x) Why nitrogen is necessary for plants? Give names of two nitrogen fertilizers.

(xi) ~~What do you mean by setting of cement?~~

(xii) Write any four points of essential qualities of a good fertilizer.

3. **Write short answers to any EIGHT parts.** 16

(i) Give reactions of bleaching powder with ammonia and carbon dioxide.

(ii) Write reaction for the preparation of bleaching powder and names of the methods used to prepare it.

(iii) Write names of these compounds. (a) $NaC\ell O_3$ (b) $HIO_3$

(iv) Why does damaged tin plated iron get rusted quickly?

(v) What are substitutional alloys? Give examples.

(vi) What arguments were given by Kekule to confirm the regular hexagonal structure for benzene?

(vii) How would you prepare benzene from acetylene and toluene from n-heptane?

(viii) What is Benedict's solution test?

(ix) Write the names of those weak oxidizing agents, which can oxidize aldehydes but not the ketones?

(x) Write molecular formulas of palmitic acid and stearic acid.

(xi) How would you prepare acetic acid from ethanol and a suitable alkane nitrile?

(xii) Give two reactions of carboxylic acids in which OH group of the acids are involved.

4. **Write short answers to any SIX parts.** 12

(i) Define functional group. Give any two examples.

(ii) What is tautomerism? Give example.

(iii) What is hydrogenolysis? Give example.

(iv) Convert $CH_4$ into formaldehyde by catalytic oxidation.

(v) What is mustard gas? How it is prepared?

(vi) Define nucleophile and electrophile.

(vii) ~~Complete the reactions: (a) $C_2H_5Br + NH_3 \rightarrow$ (b) $C_2H_5Br + CH_3COONa \rightarrow$~~

(viii) Write the structural formulae of lactic acid and tartaric acid.

(ix) Distinguish between methanol and ethanol by one test.

## SECTION – II Attempt any THREE questions. Each question carries 08 marks.

5. (a) Write similarities and differences of hydrogen with IV-A group elements. 04

(b) Describe diaphragm cell method for preparation of NaOH. 04

6. (a) Write equations for the reactions of conc $\cdot HNO_3$ with: (i) Zn (ii) Cu (iii) Sn (iv) HI 04

(b) Describe electrochemical theory to explain corrosion. 04

7. (a) Describe atomic orbital hybridization. Explain $sp^2$-hybridizaton. 04

(b) What is aldol condensation reaction? Give an example and mechanism. 04

8. (a) Explain Markownikov's rule with mechanism and two examples. 04

(b) Explain $S_N2$ reactions with example and characteristics. 04

9. (a) How straight chain structures for the benzene is ruled out. 04

(b) Give the preparation of methyl alcohol on large scale. How it may be distinguished from ethyl alcohol. 04

# Faisalabad Board-2019

Roll No. : _____

Objective
Paper Code
**8487**

**Intermediate Part Second (New Scheme)**

## CHEMISTRY (Objective) GROUP - I

Time: 20 Minutes Marks: 17

**Q.No.1** You have four choices for each objective type question as A, B, C and D. The choice which you think is correct, fill the relevant circle in front of that question number on computerized answer sheet. Use marker or pen to fill the circles. Cutting or filling two or more circles will result in zero marks in that question. Attempt as many questions as given in objective type question paper and leave other circles blank.

| S.# | Questions | A | B | C | D |
|---|---|---|---|---|---|
| 1 | The benzene molecule contains: | One double bond | Two double bonds | Three double bonds | Delocalized π-electron charge |
| 2 | Formula of chloroform is: | $CH_3C\ell$ | $CC\ell_4$ | $CH_2C\ell_2$ | $CHC\ell_3$ |
| 3 | The state of hybridization of carbon atom in methane is: | $sp^3$ | $sp^2$ | sp | $dsp^2$ |
| 4 | Group VIII of transition elements contains: | Zn , Cd , Hg | Cr, Mo, W | Fe , Ru, Os | Mn, Te, Re |
| 5 | Chlorine heptaoxide ($C\ell_2O_7$) reacts with water to form: | Hypochlorous acid | Chloric acid | Perchloric acid | Chlorine and oxygen |
| 6 | The brown gas formed when metal reduces $HNO_3$ to: | $NO_2$ | NO | $N_2O_3$ | $N_2O_5$ |
| 7 | Which element belongs to group IVA of periodic table? | Barium | Iodine | Lead | Oxygen |
| 8 | Which ion will have maximum value of heat of hydration? | $Na^+$ | $Cs^{+2}$ | $Ba^{+2}$ | $Mg^{+2}$ |
| 9 | Keeping in view the size of atoms which order is correct? | Mg > Sr | Ba > Mg | Lu > Ce | $C\ell$ > I |
| 10 | Peroxyacetyl nitrate (PAN) is an irritant to human beings and affects: | Eyes | Ears | Stomach | Nose |
| 11 | Which three elements are needed for the healthy growth of plants? | N, S, P | N, Ca, P | N, P, K | N, K, C |
| 12 | Vegetable oils are: | Glycerides of un-saturated fatty acids | Un-saturated fatty acids | Glycerides of saturated fatty acids | Essential oils obtained from plants |
| 13 | Which is a synthetic polymer? | Animal fat | Starch | Cellulose | Polyester |
| 14 | A carboxylic acid contains: | A hydroxyl group | A carboxyl group | A hydroxyl and a carboxyl group | A carboxyl and an aldehyde group |
| 15 | The carbon atom of a carbonyl group is: | sp hybridized | $sp^2$ hybridized | $sp^3$ hybridized | $dsp^2$ hybridized |
| 16 | Ethanol can be converted into ethanoic acid by: | Fermentation | Hydration | Hydrogenation | Oxidation |
| 17 | Grignard reagent is reactive due to: | The presence of halogen atom | The presence of Mg atom | The polarity of C-Mg bond | The presence of alkyl group |

Intermediate Part Second (New Scheme) Roll No. _____

# CHEMISTRY ( Subjective ) GROUP - I

Time: 02:40 Hours Marks: 68

## SECTION – I



2. **Write short answers to any EIGHT parts.** 16
   (i) Why the second value of electron affinity is usually shown with a positive sign?
   (ii) What are amphoteric oxides? Give two examples.
   (iii) Why 2% gypsum is added in grinding during the process of manufacturing of cement?
   (iv) What is the effect of heat on ortho boric acid?
   (v) Write any two points of importance of oxides of lead in paints.
   (vi) Write formulas of (a) Litharge (b) Red lead.
   (vii) Write two points of difference between red and white phosphorus.
   (viii) Write two reactions to show that $H_2SO_4$ acts as oxidizing agent.
   (ix) How does $P_2O_5$ react with water in cold and hot state?
   (x) Define macronutrients of fertilizer with suitable examples.
   (xi) What is the role of digestion step in the manufacture of paper?
   (xii) Write conditions which are required for the formation of smog.

3. **Write short answers to any EIGHT parts.** 16
   (i) Write two important uses of organic chemistry in daily life.
   (ii) How does propyne react with (a) $AgNO_3$ / $NH_4OH$ (b) $Cu_2C\ell_2$ / $NH_4OH$
   (iii) How will you bring about the following conversion? Methane to Ethane
   (iv) Write the structures of (a) Benzene (b) Naphthalene (c) Toluene (d) Biphenyl.
   (v) What is meant by the terms (a) Aromatic (b) Halogenation?
   (vi) Define (a) Nucleophile (b) Electrophile.
   (vii) Write equation showing reaction of ethyl magnesium bromide with water.
   (viii) Write the formulas of (a) 1-Butanol (b) 2-Butanol
   (ix) Why ethyl alcohol is liquid while methyl chloride is a gas?
   (x) What is the difference between essential and non-essential amino acids?
   (xi) Write the structural formulas of (a) Glycine (b) Alanine.
   (xii) What is glacial acetic acid? Write its formula.

4. **Write short answers to any SIX parts.** 12
   (i) Write balanced chemical reactions of Conc $H_2SO_4$ with (a) Sodium bromide (B) Sodium chloride.
   (ii) Give balanced chemical reaction of chlorine with cold dilute sodium hydroxide solution.
   (iii) Which is stronger acid? $HC\ell O_3$ or $HBrO_3$ and why?
   (iv) Define paramagnetism. Which two ions have the strongest paramagnetic behaviour?
   (v) How is formaldehyde prepared in laboratory? Give its chemical reaction with necessary conditions.
   (vi) Give a reaction which is used to protect a carbonyl group against strong alkaline oxidizing agents.
   (vii) Define homopolymer with an example.
   (viii) What is the difference between fats and oils?
   (ix) Give the role of DNA and RNA in life.

## SECTION – II Attempt any THREE questions. Each question carries 08 marks.

5. (a) What are the improvements made in the Mendeleev's Period Table? 04
   (b) Mention the properties of beryllium in which it does not resemble with its own family. 04

6. (a) How steel is manufactured by Bessemer's Process? 04
   (b) What is acid rain? How does it affect our environment? 04

7. (a) How will you prepare ethane by Kolbe's method and from Grignard reagent? 04
   (b) Describe nitration and bromination of benzene with mechanism. 04

8. (a) Starting from ethene, outline the reactions for the preparation of the following compounds. 04
   (i) Ethyl dibromide (ii) Ethyne (iii) Ethane (iv) Ethylene glycol
   (b) How can ethanol be prepared from (i) Molasses (ii) Starch ? 04

9. (a) Write four important points of difference between $S_N1$ and $S_N2$ mechanism 04
   (b) Explain with mechanism the addition of sodium bi-sulphite to acetone. Write utility of this reaction. 04

Roll No. : _____

Objective
Paper Code
**8488**

**Intermediate Part Second (New Scheme)**
# CHEMISTRY ( Objective ) GROUP - II
Time: 20 Minutes Marks: 17

Q.No.1 **You have four choices for each objective type question as A, B, C and D. The choice which you think is correct, fill the relevant circle in front of that question number on computerized answer sheet. Use marker or pen to fill the circles. Cutting or filling two or more circles will result in zero marks in that question. Attempt as many questions as given in objective type question paper and leave other circles blank.**

| S.# | Questions | A | B | C | D |
|---|---|---|---|---|---|
| 1 | Benzene cannot undergo: | Substitution reactions | Addition reactions | Oxidation reactions | Elimination reactions |
| 2 | Vinyl acetylene combines with HCℓ to form: | Polyacetylene | Benzene | Chloroprene | Divinyl acetylene |
| 3 | In t-butyl alcohol, the tertiary carbon is bonded to: | Two hydrogen atoms | Three hydrogen atoms | One hydrogen atom | No hydrogen atom |
| 4 | Which is a typical transition metal? | Sc | Y | Ra | Co |
| 5 | Which halogen occurs naturally in positive oxidation state? | Fluorine | Chlorine | Bromine | Iodine |
| 6 | Which species has the maximum number of unpaired electrons? | $O_2$ | $O_2^-$ | $O_2^+$ | $O_2^{2-}$ |
| 7 | Which element is not present abundantly in earth's crust? | Silicon | Aluminium | Sodium | Oxygen |
| 8 | Which sulphate is not soluble in water? | Sodium sulphate | Potassium sulphate | Zinc sulphate | Barium sulphate |
| 9 | Mark the correct statement: | All the lanthanides are present in the same group | All the halogens are present in the same period | All the alkali metals are present in the same group | All the noble gases are present in the same period |
| 10 | In the purification of potable water the coagulant used is: | Nickle sulphate | Copper sulphate | Barium sulphate | Alum |
| 11 | Micro-nutrients are required in quantity ranging from: | 4 - 40 g | 6 - 200 g | 6 - 200 kg | 4 - 40 kg |
| 12 | Which is a monosaccharide? | Fructose | Sucrose | Starch | Cellulose |
| 13 | The reaction between fat and NaOH is called: | Esterification | Hydrogenolysis | Fermentation | Saponification |
| 14 | Which is not a fatty acid? | Propanoic acid | Acetic acid | Phthalic acid | Butanoic acid |
| 15 | Which of the given compounds will not give iodoform test on treatment with $I_2$/ NaOH ? | Acetaldehyde | Acetone | Butanone | 3-pentanone |
| 16 | Which compound will have maximum repulsion with $H_2O$ ? | $C_6H_6$ | $C_2H_5OH$ | $CH_3CH_2CH_2OH$ | $CH_3 - O - CH_3$ |
| 17 | Grignard reagent is reactive due to: | The presence of halogen atom | The presence of Mg atom | The polarity of C-Mg bond | The polarity of Mg-X bond |

Intermediate Part Second (New Scheme) Roll No. _____

# CHEMISTRY ( Subjective ) GROUP - II

Time: 02:40 Hours Marks: 68

## SECTION – I



2. **Write short answers to any EIGHT parts.** 16
   (i) How do you justify the position of hydrogen at the top of group IA?
   (ii) Why does metallic character increase from top to bottom in a group of metals?
   (iii) Write any four uses of lime in industries.
   (iv) Write balanced equations for the reactions of Aℓ with (a) $H_2SO_4$ (b) NaOH
   (v) How does borax serve as a water softening agent?
   (vi) Give the names and formulae of different acids of boron.
   (vii) Write balanced equations for the reaction of orthophosphoric acid with NaOH.
   (viii) $NO_2$ is a strong oxidizing agent. Prove the truth of this statement giving examples.
   (ix) Complete and balance the given chemical equations. (a) $P + NO \rightarrow$ (b) $HNO_3 + HI \rightarrow$
   (x) What is meant by setting of cement? Discuss the reactions taking place in first 24 hours.
   (xi) What are the prospects of paper industry in Pakistan?
   (xii) Explain the process of incineration of industrial waste.

3. **Write short answers to any EIGHT parts.** 16
   (i) What is the difference between tautomerism and metamerism?
   (ii) What is raney nickel? Write its function.
   (iii) Convert $CH_4$ to $H - COOH$
   (iv) Write name of two groups which are called as meta directing group and two groups which are called as ortho, para-directing groups.
   (v) Write mechanism for sulphonation of benzene.
   (vi) Convert $C_2H_5Br$ to tetra ethyl lead (TEL).
   (vii) Convert $C_2H_5Br$ to $(C_2H_5)_2NH$
   (viii) Why absolute alcohol cannot be prepared by fermentation process?
   (ix) Draw structure of (a) methyl-n-propyl ether (b) methoxy benzene.
   (x) Write structure of (a) alanine (b) valine.
   (xi) What is ninhydrin test?
   (xii) Point out difference between protein and polypeptide.

4. **Write short answers to any SIX parts.** 12
   (i) How are the halogen acids ionized in water?
   (ii) What is bleaching powder? Give its two uses.
   (iii) Describe chemical reactions of bleaching powder with (a) HI (b) $CO_2$
   (iv) How does the process of galvanizing protect iron from rusting?
   (v) Give four uses of acetaldehyde.
   (vi) How will you distinguish between ethanal and propanal?
   (vii) What are thermoplastic polymers? Give two examples.
   (viii) What are lipids? Give their types.
   (ix) Define saponification number and iodine number.

## SECTION – II Attempt any THREE questions. Each question carries 08 marks.

5. (a) Give two similarities and two dissimilarities of hydrogen with elements of group IA. 04
   (b) Write any eight uses of lime in industry. 04

6. (a) Describe rules for naming the coordination complexes and give one example. 04
   (b) Describe air pollution briefly. 04

7. (a) What is cracking? Discuss its two types. 04
   (b) Write the classification of aromatic hydrocarbons giving one example of each. 04

8. (a) Describe Kolbe's method for the preparation of ethyne with reaction mechanism. 04
   (b) Describe Lucas test for the identification of primary, secondary and tertiary alcohols with suitable chemical reactions. 04

9. (a) Differentiate between $S_N1$ and $S_N2$ reactions. 04
   (b) Write one laboratory and one industrial method for the preparation of acetaldehyde. 04

Roll No. : _____

Objective
Paper Code
**8481**

**Intermediate Part Second (New Scheme)**
# CHEMISTRY ( Objective )
Time: 20 Minutes Marks: 17



**Q.No.1** **You have four choices for each objective type question as A, B, C and D. The choice which you think is correct, fill the relevant circle in front of that question number on computerized answer sheet. Use marker or pen to fill the circles. Cutting or filling two or more circles will result in zero marks in that question. Attempt as many questions as given in objective type question paper and leave other circles blank.**

| S.# | Questions | A | B | C | D |
|---|---|---|---|---|---|
| 1 | Which statement is incorrect? | All the metals are good conductor of electricity | All the metals are good conductor of heat | All the metals form positive ions | All the metals form acidic oxides |
| 2 | Which does not belong to alkaline-earth metals? | Be | Ra | Ba | Rn |
| 3 | Chemical composition of colemanite is: | A $Ca_2B_6O_{11} \cdot 5H_2O$ | | C $Na_2B_4O_7 \cdot 4H_2O$ | |
| | | B $CaB_4O_7 \cdot 4H_2O$ | | D $CaNaB_5O_9 \cdot 8H_2O$ | |
| 4 | Laughing gas is chemically: | NO | $N_2O$ | $NO_2$ | $N_2O_4$ |
| 5 | Which is the strongest acid: | $HC\ell O$ | $HC\ell O_2$ | $HC\ell O_3$ | $HC\ell O_4$ |
| 6 | Which is a typical transition metal? | Sc | Y | Ra | Co |
| 7 | The state of hybridization of carbon in methane is: | $sp^3$ | $sp^2$ | sp | $dsp^2$ |
| 8 | Synthetic rubber is made by polymerization of: | Chloroform | Acetylene | Divinyl acetylene | Chloroprene |
| 9 | The electrophile in aromatic sulphonation is: | $H_2SO_4$ | $HSO_4^-$ | $SO_3$ | $SO_3^+$ |
| 10 | Which is not a nucleophile? | $H_2O$ | $H_2S$ | $BF_3$ | $NH_3$ |
| 11 | Rectified spirit contains alcohol about: | 80% | 85% | 90% | 95% |
| 12 | Which compounds will not give iodoform test? | Acetaldehyde | Acetone | Butanone | 3-Pentanone |
| 13 | Which reagent is used to reduce a carboxylic acid to an alcohol? | $LiA\ell H_4$ | HI/P | $H_2/Ni$ | $H_2/Pt$ |
| 14 | The reaction between a fat and NaOH is called: | Esterification | Hydrogenolysis | Fermentation | Saponification |
| 15 | Which three elements are needed for the healthy growth of plants? | N, S, P | Na, Ca, P | N, P, K | N, K, C |
| 16 | Ecosystem is a smaller unit of: | Lithosphere | Biosphere | Atmosphere | Hydrosphere |
| 17 | A single chloride free radical can destroy how many ozone molecules? | 100 | 100000 | 10000 | 1000 |

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**Intermediate Part Second (New Scheme)** Roll No. _____

# CHEMISTRY ( Subjective )

Time: 02:40 Hours Marks: 68



## SECTION – I

2. **Write short answers to any EIGHT parts.** 16
   (i) Why $Na_2O$ is basic and $P_2O_5$ is acidic in character although both Na and P belong to same period?
   (ii) Why second electron affinity value of an electron has positive sign?
   (iii) What is milk of magnesia? Give its use.
   (iv) Give any four uses of sodium silicate.
   (v) How "Aℓ" (Aluminum) reacts with hydrogen and halogen?
   (vi) Give four uses of Boric acid.
   (vii) Why is $SO_3$ dissolved in $H_2SO_4$ and not in $H_2O$ in contact process?
   (viii) What is aqua regia? How it dissolves gold?
   (ix) Give four dissimilarities between sulphur and oxygen.
   (x) How detergents are threat to aquatic animal life?
   (xi) What is COD? How it is measured?
   (xii) What is a functional group? Name functional group present in alcohol and ether.

3. **Write short answers to any EIGHT parts.** 16
   (i) What are typical and non-typical transition elements?
   (ii) What is coordination sphere? Give one example.
   (iii) What is Clemmensen reduction? Give one example.
   (iv) Convert propyne into acetone.
   (v) Benzene is polymer of acetylene. Justify.
   (vi) Explain Wurtz synthesis with one example.
   (vii) Explain Williamsons synthesis of ether.
   (viii) Ethanol has higher boiling point than diethyl ether. Give reason.
   (ix) Explain Fehling's solution test.
   (x) Write two uses of formaldehyde.
   (xi) What is Zwitter ion? Give example.
   (xii) Write mechanism for the reaction between acetic acid and $NH_3$?

4. **Write short answers to any SIX parts.** 12
   (i) Define saponification number with a suitable example.
   (ii) Write two points of difference between a fat and an oil.
   (iii) Differentiate with at least two points between amylose and amylopectin.
   (iv) Name woody and non-woody raw materials for production of pulp (two each).
   (v) Describe the term setting of a cement.
   (vi) Write formula for (a) Calcium super phosphate (b) Diammonium phosphate.
   (vii) What is iodized salt?
   (viii) Why iodine has metallic luster? Justify.
   (ix) Name any two methods to manufacture bleaching powder. Also give reaction for this.

## SECTION – II Attempt any THREE questions. Each question carries 08 marks.

5. (a) Write a brief note on oxidation state of elements in groups of modern periodic table? 04
   (b) Describe the role of lime in industry. Write eight points. 04

6. (a) How is $KMnO_4$ prepared by (i) Stadeler's process (ii) Electrolytic oxidation process. 04
   (b) How is oil spillage affecting the marine life? 04

7. (a) Discuss cis-trans isomerism giving two examples. 04
   (b) Describe the stability of benzene on the basis of heat of hydrogenation. 04

8. (a) How is ethyne prepared by Kolbe's electrolytic method? Write its mechanism. 04
   (b) How is ethanol prepared from molasses and starch by fermentation? 04

9. (a) Write the reactions of Grignard reagent with: (i) Alcohol (ii) $CO_2$ (iii) $C\ell - CN$ (iv) $CH_3 - \overset{O}{\overset{\|}{C}} - H$ 04
   (b) Write the reactions of acetaldehyde with: 04
   (i) $NaBH_4/H_2O$ (ii) $H_2/Pd$ (iii) Dry $HC\ell/C_2H_5OH$ (iv) $I_2/NaOH$