

Note : Four possible answers A, B, C and D to each question are given. The choice which you think is correct, fill that circle in front of that question with Marker or Pen ink in the answer-book. Cutting or filling two or more circles will result in zero mark in that question.

1-1	Which of these polymers is an addition polymer : (A) Nylon-6,6 (B) Polystyrene ● (C) Terylene (D) Epoxy resin
2	Preparation of vegetable ghee involves : (A) Halogenation (B) Dehydrogenation (C) Hydroxylation (D) ● Hydrogenation
3	One of the following hydrogen halide is the weakest acid in solution : (A) HI (B) HBr (C) HCl (D) ● HF
4	Which compound shows hydrogen bonding : (A) C ₂ H ₆ (B) C ₂ H ₅ Cl (C) CH ₃ –CH ₂ –CH ₃ (D) ● C ₂ H ₅ OH
5	One of the following acid can be used as a catalyst in Friedel-Crafts reactions : (A) AlCl ₃ ● (B) HNO ₃ (C) BeCl ₂ (D) H ₂ SO ₄
6	Down's cell is used to prepare : (A) Sodium carbonate (B) Sodium bicarbonate (C) Sodium metal ● (D) Sodium hydroxide
7	Newspaper can be recycled again and again by how many times : (A) 2 (B) 3 (C) 4 (D) ● 5
8	Co-ordination number of Pt in [PtCl ₂ (NO ₂)(NH ₃) ₄] is : (A) 6 ● (B) 4 (C) 1 (D) 2-
9	Acetic acid is manufactured by : (A) Distillation (B) Ozonolysis (C) Fermentation ● (D) Esterification
10	Select the two normal elements which are present in fourth period : (A) K, Ca ● (B) Rb, Sr (C) Cs, Ba (D) Fr, Ra
11	When ethylene epoxide (CH ₂ –CH ₂) is made to react with ethyl magnesium bromide followed by acid hydrolysis the product formed is : (A) 1-propanol (B) 2-propanol (C) 1-butanol ● (D) 2-butanol
12	One of the following metal used in the thermite process because of its reactivity : (A) Iron (B) Copper (C) Aluminium ● (D) Zinc
13	Which woody raw material is used for the manufacture of paper pulp : (A) Cotton (B) Bagasse (C) Poplar ● (D) Rice straw
14	Cannizzaro's reaction is not given by : (A) Formaldehyde (B) Acetaldehyde ● (C) Benzaldehyde (D) Trimethylacetaldehyde
15	The formation of chloramines prevented in ---- pH : (A) Acidic (B) Alkaline ● (C) Neutral (D) Low
16	Select from the following one which is alcohol : (A) CH ₃ –O–CH ₃ (B) CH ₃ –CH ₂ –OH ● (C) CH ₃ COOH (D) CH ₃ –CH ₂ –Br
17	Choose the gas which is obtained by the reaction of phosphorus with thionyl chloride : (A) SO ₂ ● (B) PH ₃ (C) CO ₂ (D) C ₂ H ₂

SECTION – I

2. Write short answers to any EIGHT (8) questions :

16

- (i) Why the second value of electron affinity of an element is usually shown with a positive sign? Give example.
- (ii) Prove that ZnO is an amphoteric oxide.
- (iii) Write down the chemical formula of dolomite and asbestos.
- (iv) What is milk of magnesia and where it is used?
- (v) What is anode coating?
- (vi) Why does the compounds of transition elements are coloured?
- (vii) Define nucleophile with two examples.
- (viii) Which is the best method for the preparation of alkyl halide? Give reaction.
- (ix) Define saponification number with an example.
- (x) Write down the structures of acrylic acid and acrylonitrile.
- (xi) Differentiate between copolymer and terpolymer. Give examples.
- (xii) Why nitrogenous fertilizers are supplied to plants?

3. Write short answers to any EIGHT (8) questions :

16

- (i) What is the effect of temperature on N_2O_4 ?
- (ii) How does HNO_3 react with Cu metal?
- (iii) Why iodine has metallic luster?
- (iv) Which halogen is used as an antiseptic?
- (v) Explain the type of bonds and shape of HCHO molecule using hybridization approach.
- (vi) Write the structural formulas of the possible isomers of C_4H_{10} .
- (vii) How 2-Butene will react with following reagents :
(a) O_2 in the presence of Ag (b) Br_2 in CCl_4
- (viii) What is Raney Nickel and give its use?
- (ix) How to test the unsaturation of alkenes? Give reaction.
- (x) What are secondary pollutants?
- (xi) What is meant by term BOD and COD?
- (xii) How does ozone help to protect us?

4. Write short answers to any SIX (6) questions :

12

- (i) What are different types of boric acid? Give their names.
- (ii) What are products formed when aluminium reacts with HCl and H_2SO_4 ?
- (iii) Give four common properties of group IVA elements.
- (iv) How is ethyl benzene prepared through Wurtz fitting reaction?
- (v) How are ethyl chloride and ethyl amine prepared from ethanol?

Lahore Board-2024

(2)



4. (vi) How will you convert ethanol into ethanal?
(vii) Give four uses of acetaldehyde.
(viii) What is Ninhydrin test? Which compounds are detected through this test?
(ix) How would you carry out the following conversions :
(a) Acetic acid into acetamide. (b) Acetic acid into acetone.

SECTION – II

Note : Attempt any **THREE** questions.

5. (a) Discuss variation of melting and boiling points of elements across the short periods of periodic table. 4
(b) Give any four points to elaborate the peculiar behaviour of beryllium. 4
6. (a) How does fluorine differ from its own family members? 4
(b) What is setting of cement? Discuss the reactions taking place in first 24 hours in setting of cement. 4
7. (a) Define hybridization and describe sp-hybridization of ethyne. 4
(b) Write a note on Beta-Elimination Reactions of alkyl halides. 4
8. (a) How does ethyne reacts with : 4
(i) Halogen acid
(ii) Strong alkaline KMnO_4 solution
(iii) Water in the presence of $\text{HgSO}_4 / \text{H}_2\text{SO}_4$
(iv) Ammonia in the presence of Al_2O_3 .
- (b) Explain haloform reaction by giving four reaction of halogen with : 4
- (i) CH_3CHO (ii) CH_3COCH_3 (iii) $\text{CH}_3 - \overset{\text{OH}}{\underset{|}{\text{CH}}} - \text{CH}_3$ (iv) $\text{CH}_3\text{CH}_2\text{OH}$
9. (a) Give two reactions in which benzene behave as saturated compounds and two in which benzene behave as unsaturated compound. 2,2
(b) How will you prepare bakelite and picric acid from phenols. 3,1

191-224-I-(Essay Type)-52000

Note : Four possible answers A, B, C and D to each question are given. The choice which you think is correct, fill that circle in front of that question with Marker or Pen ink in the answer-book. Cutting or filling two or more circles will result in zero mark in that question.

1-1	Ethers show the phenomenon of : (A) Position isomerism (B) Functional group isomerism (C) Meta merism (D) Cis trans isomerism
2	Molecular formula of white phosphorus is : (A) P_4 (B) P_8 (C) P_3 (D) P_2
3	Which of the following reagents will react with both aldehydes and ketones : (A) Grignard reagent (B) Tollen's reagent (C) Fehling reagent (D) Benedicts reagent
4	Which three elements are needed for the healthy growth of plants : (A) N, S, P (B) N, Ca, P (C) N, P, K (D) N, K, C
5	The mineral ($CaSO_4 \cdot 2H_2O$) has a general name : (A) Gypsum (B) Dolomite (C) Calcite (D) Epsom salt
6	A single chloride free radical can destroy how many ozone molecules : (A) 100 (B) 100000 (C) 10000 (D) 10
7	Hydrogen bond is strongest between the molecules of : (A) HF (B) HCl (C) HBr (D) HI
8	Which compound is responsible for ozone depletion : (A) $CHCl_3$ (B) CH_2Cl_2 (C) CFC (D) CCl_4
9	Which one of the nitrogen base is not present in RNA : (A) Cytocine (B) Adenine (C) Thiamine (D) Uracil
10	Benzene cannot undergo : (A) Substitution reaction (B) Addition reaction (C) Oxidation reaction (D) Elimination reaction
11	The chief ore of aluminum is : (A) Na_2AlF_6 (B) $Al_2O_3 \cdot 2H_2O$ (C) Al_2O_3 (D) $Al_2O_3 \cdot H_2O$
12	Which of the following has maximum hydration energy : (A) Li^+ (B) Na^+ (C) K^+ (D) Mg^{+2}
13	Ether linkage is : (A) $\begin{array}{c} \\ -C-N-C- \\ \end{array}$ (B) $\begin{array}{c} \\ -C-O-C- \\ \end{array}$ (C) $\begin{array}{c} \\ -C-S-C- \\ \end{array}$ (D) $\begin{array}{c} \\ -C=N-C- \\ \end{array}$
14	The order of a typical S_N2 reaction is : (A) Zero (B) First (C) Second (D) Third
15	Coordination number of Pt in $[PtCl(NO_2)(NH_3)_4]$ is : (A) 2- (B) 4 (C) 1 (D) 6
16	Which compound is called a universal solvent : (A) H_2O (B) CH_3OH (C) C_2H_5OH (D) CH_3-O-CH_3
17	The solution of which acid is used for seasoning of food : (A) Formic acid (B) Acetic acid (C) Benzoic acid (D) Butanoic acid

SECTION – I

2. Write short answers to any EIGHT (8) questions :

16

- (i) Why size of cation is smaller than its parent atom? Give example also.
- (ii) Why diamond is a non-conductor while graphite is conductor?
- (iii) What is lime mortar?
- (iv) Write down the chemical formula of Sylvite and Natron.
- (v) Find the value of 'x' in the complex of Fe (II), $[Fe(CN)_6]^x$.
- (vi) Under what conditions does Al corrode?
- (vii) Why R-I is more reactive than R-F?
- (viii) Define leaving group with two examples.
- (ix) Differentiate between homopolymer and terpolymer. Give examples.
- (x) Write down the structures of epichlorohydrin and diphenylol propane.
- (xi) Write down any two characteristics of lipids.
- (xii) Write any four essential qualities of a good fertilizer.



3. Write short answers to any EIGHT (8) questions :

16

- (i) Why does aqua regia dissolve platinum?
- (ii) How does NO₂ act as an oxidizing agent?
- (iii) Why HF is weaker acid than HBr?
- (iv) Which halogen is used as an antiseptic?
- (v) What is antiknocking agent and give its disadvantage?
- (vi) What is tautomerism? Give example.
- (vii) How to prepare formaldehyde from ethene?
- (viii) How does propyne react with : (a) 10% H₂SO₄ in the presence of HgSO₄
(b) Alkaline KMnO₄
- (ix) How to prepared alkane from carbonyl compounds?
- (x) How does acid rain affect our environment?
- (xi) How is ozone layer depleted by CFC₃?
- (xii) What are the harmful effects of chlorination of H₂O?

4. Write short answers to any SIX (6) questions :

12

- (i) Give four uses of aluminium.
- (ii) What is meant by the term “ inert pair”? Give brief description.
- (iii) What is water glass? How is it prepared from sodium carbonate?
- (iv) What happens when benzene is heated with conc. H₂SO₄ at 250 °C ?
- (v) Why is the boiling point of ethanol higher than that of diethyl ether?

(Turn Over)

Lahore Board-2024

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4. (vi) Write structural formulas of acetophenone and picric acid.
- (vii) How is acetaldehyde prepared from ethylene and acetone from calcium acetate?
- (viii) How is acetic acid prepared from ethanol?
- (ix) What is the difference between acidic and basic amino acids? Give examples.



SECTION – II

Note : Attempt any **THREE** questions.

5. (a) Mention four improvements made in Mendeleev's periodic table by Moseley. 4
- (b) Describe the commercial preparation of sodium by Down's cell. 4
6. (a) Describe relative reactivities of the halogens as oxidizing agents. 4
- (b) Describe phosphatic fertilizers and potassium fertilizers. 4
7. (a) Explain geometric isomerism with suitable examples and also give necessary condition for compound to show geometric isomerism. 4
- (b) Give four equations with condition for the preparation of alkyl halides from alcohols. 4
8. (a) Discuss catalytic oxidation of methane. 4
- (b) Describe the reaction of ethanal and acetone with following : 2,2
- (i) Hydroxyl amine. (ii) Phenyl hydrazine
9. (a) Write down any two reactions in which benzene behaves as if it is a saturated hydrocarbon and two reactions in which it behaves as if it is unsaturated. 2,2
- (b) How will you prepare (i) Bakelite (ii) Phenyl acetate from phenol. 2,2

228-224-II-(Essay Type)-22000

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1-1	Which of these polymers is an addition polymer : (A) Nylon – 6,6 (B) Polystyrene (C) Terylene (D) Epoxy resin
2	Vinyl acetylene combines with HCl to form : (A) Polyacetylene (B) Benzene (C) Chloroprene (D) Divinyl acetylene
3	The anhydride of $HClO_4$ is : (A) ClO_3 (B) ClO_2 (C) Cl_2O_5 (D) Cl_2O_7
4	According to Lewis concept ethers behave as : (A) Acid (B) Base (C) Acid as well as base (D) None of these
5	Benzene can not undergo : (A) Substitution reaction (B) Addition reaction (C) Oxidation reaction (D) Elimination reaction
6	Which of the following sulphate is not soluble in water : (A) Sodium sulphate (B) Potassium sulphate (C) Zinc sulphate (D) Barium sulphate
7	Phenol-formaldehyde resin is called : (A) Bakelite (B) Teflon (C) Orlon (D) Terylene
8	The state of hybridization of carbon atom in methane is : (A) sp^3 (B) sp^2 (C) sp (D) dsp^2
9	Which test is applied to detect amino acids : (A) Fehling's test (B) Iodoform test (C) Ninhydrin test (D) Sodium nitroprusside test
10	The oxides of metals are : (A) Acidic (B) Basic (C) Amphoteric (D) Neutral
11	Which one of the following is not nucleophile : (A) H_2O (B) H_2S (C) BF_3 (D) NH_3
12	Tincal is a mineral of : (A) Al (B) B (C) Si (D) C
13	Which is not a calcareous material : (A) Lime (B) Clay (C) Marble (D) Marine shell
14	The carbon atom of a carboxyl group is : (A) sp - hybridized (B) sp^2 - hybridized (C) sp^3 - hybridized (D) None of these
15	The residence time of NO in atmosphere is : (A) One day (B) Two days (C) Three days (D) Four days
16	A double bond consists of : (A) Two sigma bonds (B) One sigma and one pi bond (C) One sigma and two pi bonds (D) Two pi bonds
17	Laughing gas is chemically : (A) NO (B) N_2O (C) NO_2 (D) N_2O_4

SECTION – I

2. Write short answers to any EIGHT (8) questions :

16

- (i) Write down the chemistry of borax bead test.
- (ii) Draw the electronic structure of CO and CO₂.
- (iii) How will you convert boric acid into borax?
- (iv) Convert benzene into glyoxal.
- (v) Mention the product when phenol is distilled with Zn dust by giving reaction.
- (vi) Give two uses of silicones.
- (vii) Define saponification number.
- (viii) How polyvinyl acetate is formed? Write its equation.
- (ix) Draw the structure of cholesterol.
- (x) Write down the equation, when suspended impurities are removed in the colloidal form in raw water.
- (xi) Define acid rain.
- (xii) Mention the hazards of chloroform.

3. Write short answers to any EIGHT (8) questions :

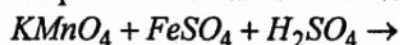
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- (i) Give the two reactions for the preparation of N₂O.
- (ii) Write down four uses of HNO₃.
- (iii) Give the reactions of H₂SO₄ with : (a) NaCl (b) KNO₃
- (iv) Convert CH₄ into formaldehyde by catalytic oxidation.
- (v) Define Markownikov's rule. Give an example.
- (vi) Prepare ozonide from ethene.
- (vii) Name two main factors which govern reactivity of R-X bond in alkyl halides.
- (viii) Define nucleophile. Give two examples.
- (ix) What is vital force theory?
- (x) What are heterocyclic organic compounds? Give two examples.
- (xi) Write down four essential qualities of a good fertilizer.
- (xii) Write down two chemical reactions involved in the preparation of urea.

4. Write short answers to any SIX (6) questions :

12

- (i) Complete and balance the following chemical equation :



- (ii) Give systematic names of the following :



- (iii) What is meant by "central metal ion"? Explain with one example.
- (iv) How are ethene and diethyl ether produced from ethyl alcohol?
- (v) Explain Lucas test.

(Turn Over)

Lahore Board-2023

(2)

4. (vi) Give reactions of phenol with : (a) Bromine water. (b) Conc. H_2SO_4
(vii) What is Benedict's solution test? Give reaction.
(viii) How does hydrazine react with acetone?
(ix) Write reaction between acetic acid and ammonia for the formation of amide.

SECTION – II

Note : Attempt any **THREE** questions.

5. (a) Define hydration energy. Give its trend in the periodic table. 4
(b) Explain peculiar behaviour of Beryllium. 4
6. (a) What happens when bleaching powder reacts with the following reagents : 1,1,1,1
(i) dil. H_2SO_4 (ii) Excess of conc. H_2SO_4 (iii) NH_3 (iv) CO_2
(b) How is urea manufactured in Pakistan? Describe in detail. 4
7. (a) What is orbital hybridization? Explain the geometry of ethyne by sp hybridization. 4
(b) Explain Friedel-Crafts acylation of benzene along with its mechanism. 4
8. (a) How can ethyne be converted into : (i) Oxalic acid. (ii) Acetaldehyde. 2,2
(b) Discuss S_N1 mechanism for nucleophilic substitution reaction of alkyl halide. 4
9. (a) Discuss the oxidation of ketones and aldehydes in detail. 4
(b) How can you prepare the following from ethanoic acid : 1,1,1,1
(i) Ethyl alcohol. (ii) Ethane. (iii) Sodium acetate. (iv) Acetic anhydride.

191-223-I-(Essay Type)-42000



Note : Four possible answers A, B, C and D to each question are given. The choice which you think is correct, fill that circle in front of that question with Marker or Pen ink in the answer-book. Cutting or filling two or more circles will result in zero mark in that question.

1-1	Elimination bimolecular reactions involve : (A) First order kinetics (B) Second order kinetics (C) Third order kinetics (D) Zero order kinetics
2	Which one of the following is a typical transition element : (A) Sc (B) Y (C) Zn (D) Co
3	Cannizzaro's reaction is given by : (A) Formaldehyde (B) Acetone (C) Acetaldehyde (D) 3-pentanone
4	Which one of the following does not belong to alkaline earth metals : (A) Be (B) Ra (C) Ba (D) Rn
5	The normal amount of overhead ozone is about : (A) 150 DU (B) 250 DU (C) 350 DU (D) 450 DU
6	Synthetic rubber is made by the polymerization of : (A) Chloroform (B) Acetylene (C) Divinyl acetylene (D) Chloroprene
7	Which catalyst is used in the contact process : (A) Fe_2O_3 (B) V_2O_5 (C) SO_3 (D) Ag_2O
8	Which statement is incorrect : (A) All the metals are good conductor of electricity (B) All the metals are good conductor of heat (C) All the metals form positive ions (D) All the metals form acid oxides
9	Which compound is called a universal solvent : (A) H_2O (B) CH_3OH (C) C_2H_5OH (D) $CH_3 - O - CH_3$
10	Which one is argillaceous material : (A) Clay (B) Lime (C) Marble (D) Marine shell
11	The electrophile in aromatic sulphonation is : (A) H_2SO_4 (B) HSO_4^- (C) SO_3 (D) SO_3^+
12	The anhydride of $HClO_4$ is : (A) ClO_3 (B) Cl_2O_5 (C) ClO_2 (D) Cl_2O_7
13	Which of the following element is present in all amino acids : (A) Br (B) N (C) Cl (D) Cu
14	Ethers show the phenomenon of : (A) Position isomerism (B) Functional group isomerism (C) Metamerism (D) Cis-trans isomerism
15	Aluminium oxide is : (A) Acidic oxide (B) Basic oxide (C) Amphoteric oxide (D) None of these
16	According to Lewis concept ethers behave as : (A) Acid (B) Base (C) Acid as well as a base (D) None of these
17	Alkane nitriles can be converted into carboxylic acids by : (A) Hydration (B) Acid hydrolysis (C) Hydrogenation (D) Oxidation

SECTION – I

2. Write short answers to any EIGHT (8) questions :



16

- (i) How does orthoboric acid react with : (a) NaOH (b) C_2H_5OH
- (ii) Why are aluminium sheets said to be free from corrosion?
- (iii) What is water glass? How is it prepared? Give reaction.
- (iv) How is ethyl benzene obtained from bromobenzene? Give reaction.
- (v) How is maleic acid obtained from benzene? Give reaction.
- (vi) Why is nitro group meta-directing?
- (vii) What is meant by addition polymerization? Give an example.
- (viii) Give structures of the monomers of polyvinyl chloride and polystyrene.
- (ix) What is the difference between oligosaccharides and polysaccharides?
- (x) How is quality of raw water improved by aeration process?
- (xi) Why is ozone layer depleting?
- (xii) How is plastic recycled by depolymerization?

3. Write short answers to any EIGHT (8) questions :

16

- (i) What is catalytic cracking? Give its importance.
- (ii) What are alicyclic compounds? Give example.
- (iii) Convert ethyne into acrylonitrile.
- (iv) What are epoxides? How these are prepared from alkene?
- (v) Give nitration reaction of methane.
- (vi) How does conc. H_2SO_4 reacts with "C and S"?
- (vii) Give the effect of heat on H_3PO_4 .
- (viii) What is laughing gas? How is it prepared?
- (ix) Define leaving group. Give some examples.
- (x) Convert C_2H_5MgBr into ethane.
- (xi) What are fertilizers? Why they are needed?
- (xii) Mention raw materials used for cement.

4. Write short answers to any SIX (6) questions :

12

- (i) Define the terms : (a) Coordination sphere. (b) Ligand.
- (ii) Give the systematic names to following complexes :
(a) $[Fe(H_2O)_6]^{2+}$ (b) $Na_3[CoF_6]$
- (iii) What is sacrificial corrosion?
- (iv) How will you distinguish between alcohol and phenol?
- (v) How will you convert methanol into ethanol?

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Lahore Board-2023

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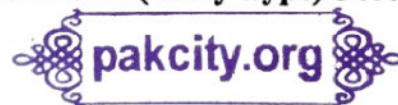
4. (vi) Why ethanol has higher boiling point than diethyl ether?
(vii) How are ketones oxidized by $K_2Cr_2O_7 / H_2SO_4$?
(viii) Give the mechanism of addition of HCN to acetone.
(ix) What is the strecker's synthesis?

SECTION – II

Note : Attempt any **THREE** questions.

5. (a) Describe the metallic and non-metallic character of elements in the modern periodic table. 4
(b) How is sodium metal prepared by Down's cell? Explain it. 4
6. (a) Give any four applications of noble gases. 4
(b) What is setting of cement? Give the reaction taking place in 1st 24 hours. 1,3
7. (a) What is functional group? Give three examples of oxygen containing functional groups. 4
(b) Explain Friedel-Crafts alkylation of benzene alongwith its mechanism. 4
8. (a) What is polymerization? Describe the linear and cyclic polymerization of alkynes. 1,3
(b) By using Grignard reagent prepare : (i) Primary alcohol. (ii) Carboxylic acids. 2,2
9. (a) Describe mechanism of reaction of aldehyde (having no α -hydrogen) in which both oxidation and reduction takes place simultaneously. 4
(b) Write the mechanism of ester formation by using carboxylic acid and ethanol. 4

228-223-II-(Essay Type)-34000



CHEMISTRY

222-(INTER PART – II)

Time Allowed : 20 Minutes

Q.PAPER – II (Objective Type)

GROUP – I

Maximum Marks : 17

PAPER CODE = 8485

Note : Four possible answers A, B, C and D to each question are given. The choice which you think is correct, fill that circle in front of that question with Marker or Pen ink in the answer-book. Cutting or filling two or more circles will result in zero mark in that question.

1-1	Which one of the following is not a nucleophile :
	(A) H_2O (B) H_2S (C) BF_3 (D) NH_3
2	Which of following is a typical transition element :
	(A) Sc (B) Y (C) Ra (D) Co
3	Acetic acid is manufactured by :
	(A) Distillation (B) Fermentation (C) Ozonolysis (D) Esterification
4	Chile saltpetre has the chemical formula :
	(A) $NaNO_3$ (B) KNO_3 (C) $Na_2B_4O_7$ (D) Na_2CO_3
5	Ozone layer is present in range of :
	(A) 0 – 5 km (B) 10 – 15 km (C) 15 – 25 km (D) 25 – 28 km
6	Formula of chloroform is :
	(A) CH_3Cl (B) CCl_4 (C) CH_2Cl_2 (D) $CHCl_3$
7	Laughing gas is chemically :
	(A) NO (B) N_2O (C) NO_2 (D) N_2O_4
8	Which among following oxides is amphoteric :
	(A) Na_2O (B) MgO (C) SO_3 (D) ZnO
9	Which compound is called a universal solvent :
	(A) H_2O (B) CH_3OH (C) C_2H_5OH (D) $CH_3 - O - CH_3$
10	Which is not a calcareous material :
	(A) Lime (B) Clay (C) Marble (D) Marine shell
11	The electrophile in aromatic sulphonation is :
	(A) H_2SO_4 (B) HSO_4^- (C) SO_3 (D) SO_3^+
12	The anhydride of $HClO_4$ is :
	(A) ClO_3 (B) ClO_2 (C) Cl_2O_5 (D) Cl_2O_7
13	Residence time of NO in atmosphere is :
	(A) 1 day (B) 2 days (C) 3 days (D) 4 days
14	The state of hybridization of carbon atom in methane is :
	(A) sp^3 (B) sp^2 (C) sp (D) dsp^2
15	Tinical is a mineral of :
	(A) Al (B) B (C) Si (D) C
16	The carbon atom of a carboxyl group is :
	(A) sp hybridized (B) sp^2 hybridized (C) sp^3 hybridized (D) sp^3d^2 hybridized
17	The reaction between fat and NaOH is called :
	(A) Esterification (B) Hydrogenolysis (C) Fermentation (D) Saponification

SECTION – I



2. Write short answers to any EIGHT (8) questions :

16

- (i) Lanthanide contraction controls the atomic sizes of elements of 6th and 7th periods. Give reason.
- (ii) Explain the variations in melting points along the short periods.
- (iii) Why is the aqueous solution of Na_2CO_3 alkaline in nature? Give reaction only.
- (iv) What happens when LiOH is heated to red hot? Give reaction.
- (v) How does boric acid react with : (a) Ethyl alcohol (b) Na_2CO_3
- (vi) Give chemistry of borax-bead test.
- (vii) Name the allotropes of phosphorus. How red phosphorus is prepared?
- (viii) Give the reaction of phosphorus with : (a) Thionyl chloride (b) $Cl_2(g)$
- (ix) Briefly discuss the property of paramagnetism in transition elements compounds.
- (x) What are : (a) Interstitial compounds. (b) Substitutional alloys.
- (xi) Briefly discuss the digestion process in paper manufacturing.
- (xii) Discuss the reactions taking place in first 24 hours of setting of cement.

3. Write short answers to any EIGHT (8) questions :

16

- (i) Why HF is weaker acid than HCl?
- (ii) What are freons and teflon?
- (iii) Discuss carbonization of coal.
- (iv) Define functional group. Give one example.
- (v) Why is sigma bond inert?
- (vi) Discuss hydroxylation of ethene.
- (vii) How is water added to propyne? Write reaction.
- (viii) How are tetramethyl and tetraethyl lead prepared?
- (ix) How can 1-chloropropane be converted to propene?
- (x) Define polysaccharides, also give example.
- (xi) Differentiate between DNA and RNA.
- (xii) What is hardening of oils? Give reaction.

4. Write short answers to any SIX (6) questions :

12

- (i) What is Wurtz-Fitting reaction.
- (ii) What are polycyclic aromatic hydrocarbons? Give two examples.
- (iii) Convert phenol into : (a) 2, 4, 6 tribromophenol (ii) Cyclohexanol.
- (iv) Write equations for the preparation of ethanol by the fermentation of Molasses.
- (v) What is iodoform test?

(Turn Over)

Lahore Board-2022

(2)

4. (vi) Convert acetylene into acetic acid.
(vii) Write down the structural formulas of Glycine and Alanine amino acids.
(viii) How detergents are threat to aquatic animal life?
(ix) Write down the four harmful effects of acid rain.

SECTION – II

Note : Attempt any **THREE** questions.

5. (a) Write down two points of similarities and two points of differences between hydrogen and halogen (VII A) 4
(b) Give one method for the preparation of H_3BO_3 . How does it react with : 4
(i) NaOH (ii) Na_2CO_3 (iii) C_2H_5OH
6. (a) Discuss hard finish plasters and cement plaster. 4
(b) How steel is manufactured by Bessemer process. 4
7. (a) Discuss structure of ethyne on the basis of sp-hybridization. 4
(b) Convert ethyl bromide into : 4
(i) Ethane. (ii) Propane. (iii) Ethyl alcohol (iv) n-Butane
8. (a) Give the reaction of ethene with (i) H_2SO_4 (ii) O_3 (iii) HOX (iv) Br_2 4
(b) Describe the various tests for identification of carboxyl compounds (Any four). 4
9. (a) Write the mechanism of nitration and sulphonation of benzene. 4
(b) Describe the two reactions of alcohol and phenol in which “O – H” bond break. 4

228-222-II-(Essay Type)-34000



CHEMISTRY

222-(INTER PART – II)

Time Allowed : 20 Minutes

Q.PAPER – II (Objective Type)

GROUP – II **LHR-G2-22** Maximum Marks : 17**PAPER CODE = 8484**

Note : Four possible answers A, B, C and D to each question are given. The choice which you think is correct, fill that circle in front of that question with Marker or Pen ink in the answer-book. Cutting or filling two or more circles will result in zero mark in that question.

1-1	The anhydride of $HClO_4$ is : (A) ClO_3 (B) ClO_2 (C) Cl_2O_5 (D) Cl_2O_7
2	During nitration of benzene, the active nitrating agent is : (A) NO_3 (B) NO_2^+ (C) NO_2 (D) HNO_3
3	Which one of the following nitrogenous base is not present in RNA : (A) Cytosine (B) Adenine (C) Thiamine (D) Uracil
4	Ecosystem is a smaller unit of : (A) Lithosphere (B) Hydrosphere (C) Atmosphere (D) Biosphere
5	Keeping in view the size of atoms which order is the correct one : (A) $Mg > Sr$ (B) $Ba > Mg$ (C) $Lu > Ce$ (D) $Cl > I$
6	Which of the following reagents will react with both aldehydes and ketones : (A) Grignard reagent (B) Tollen's reagent (C) Fehling's reagent (D) Benedict's reagent
7	Tinical is a mineral of : (A) Al (B) B (C) Si (D) C
8	Which enzyme is not involved in fermentation of starch : (A) Diastase (B) Zymase (C) Urease (D) Invertase
9	The main pollutant of leather tanneries in the waste water is due to : (A) Lead (B) Chromium (VI) (C) Copper (D) Chromium (III)
10	Linear shape is associated with which set of hybrid orbitals : (A) sp (B) sp^2 (C) sp^3 (D) dsp^2
11	Which ion will have the maximum value of heat of hydration : (A) Na^+ (B) Cs^+ (C) Ba^{++} (D) Mg^{++}
12	Vinyl acetylene combines with HCl to form : (A) Polystyrene (B) Benzene (C) Chloroprene (D) Divinyl acetylene
13	The colour of transition metal complexes is due to : (A) d-d- transition of electrons (B) Paramagnetic nature of transition elements (C) Ionization (D) Loss of s-electrons
14	In primary alkyl halides, the halogen atom is attached to a carbon which is further attached to how many carbon atoms : (A) Two (B) Three (C) One (D) Four
15	Which catalyst is used in contact process : (A) Fe_2O_3 (B) V_2O_5 (C) SO_3 (D) Ag_2O
16	Acetic acid is manufactured by : (A) Distillation (B) Fermentation (C) Ozonolysis (D) Esterification
17	Phosphorous helps in the growth of : (A) Root (B) Leave (C) Stem (D) Seed

SECTION – I

2. Write short answers to any EIGHT (8) questions :

16

- (i) Lanthanide contraction controls the atomic sizes of elements of 6th and 7th periods. Give reason.
- (ii) Explain the variations in melting points along the short periods.
- (iii) Why is the aqueous solution of Na_2CO_3 alkaline in nature? Give reaction only.
- (iv) What happens when LiOH is heated to red hot? Give reaction.
- (v) How does boric acid react with : (a) Ethyl alcohol (b) Na_2CO_3
- (vi) Give chemistry of borax-bead test.
- (vii) Name the allotropes of phosphorus. How red phosphorus is prepared?
- (viii) Give the reaction of phosphorus with : (a) Thionyl chloride (b) $Cl_2(g)$
- (ix) Briefly discuss the property of paramagnetism in transition elements compounds.
- (x) What are : (a) Interstitial compounds. (b) Substitutional alloys.
- (xi) Briefly discuss the digestion process in paper manufacturing.
- (xii) Discuss the reactions taking place in first 24 hours of setting of cement.

3. Write short answers to any EIGHT (8) questions :

16

- (i) Why HF is weaker acid than HCl?
- (ii) What are freons and teflon?
- (iii) Discuss carbonization of coal.
- (iv) Define functional group. Give one example.
- (v) Why is sigma bond inert?
- (vi) Discuss hydroxylation of ethene.
- (vii) How is water added to propyne? Write reaction.
- (viii) How are tetramethyl and tetraethyl lead prepared?
- (ix) How can 1-chloropropane be converted to propene?
- (x) Define polysaccharides, also give example.
- (xi) Differentiate between DNA and RNA.
- (xii) What is hardening of oils? Give reaction.

4. Write short answers to any SIX (6) questions :

12

- (i) What is Wurtz-Fitting reaction.
- (ii) What are polycyclic aromatic hydrocarbons? Give two examples.
- (iii) Convert phenol into : (a) 2, 4, 6 tribromophenol (ii) Cyclohexanol.
- (iv) Write equations for the preparation of ethanol by the fermentation of Molasses.
- (v) What is iodoform test?

(Turn Over)

Lahore Board-2022

(2)



4. (vi) Convert acetylene into acetic acid.
(vii) Write down the structural formulas of Glycine and Alanine amino acids.
(viii) How detergents are threat to aquatic animal life?
(ix) Write down the four harmful effects of acid rain.

SECTION – II

Note : Attempt any THREE questions.

5. (a) Write down two points of similarities and two points of differences between hydrogen and halogen (VII A) 4
(b) Give one method for the preparation of H_3BO_3 . How does it react with : 4
(i) NaOH (ii) Na_2CO_3 (iii) C_2H_5OH
6. (a) Discuss hard finish plasters and cement plaster. 4
(b) How steel is manufactured by Bessemer process. 4
7. (a) Discuss structure of ethyne on the basis of sp-hybridization. 4
(b) Convert ethyl bromide into : 4
(i) Ethane. (ii) Propane. (iii) Ethyl alcohol (iv) n-Butane
8. (a) Give the reaction of ethene with (i) H_2SO_4 (ii) O_3 (iii) HOX (iv) Br_2 4
(b) Describe the various tests for identification of carboxyl compounds (Any four). 4
9. (a) Write the mechanism of nitration and sulphonation of benzene. 4
(b) Describe the two reactions of alcohol and phenol in which “O – H” bond break. 4

228-222-II-(Essay Type)-34000

CHEMISTRY

221-(INTER PART – II)

Time Allowed : 20 Minutes

Q.PAPER – II (Objective Type)

GROUP – I

Maximum Marks : 17

PAPER CODE = 8483

Note : Four possible answers A, B, C and D to each question are given. The choice which you think is correct, fill that circle in front of that question with Marker or Pen ink in the answer-book. Cutting or filling two or more circles will result in zero mark in that question.

1-1	Hydrogen bond is the strongest between the molecules of : (A) HF (B) HCl (C) HBr (D) HI
2	Formula of chloroform is : (A) CH_3Cl (B) CCl_4 (C) CH_2Cl_2 (D) $CHCl_3$
3	Ketones are prepared by the oxidation of : (A) Primary alcohol (B) Secondary alcohol (C) Tertiary alcohol (D) All of these
4	Which is not a calcareous material : (A) Lime (B) Clay (C) Marble (D) Marine shell
5	Keeping in view the size of atoms, which order is the correct one : (A) $Mg > Sr$ (B) $Ba > Mg$ (C) $Lu > Ce$ (D) $Cl > I$
6	Rectified spirit contains ethyl alcohol : (A) 80% (B) 85% (C) 90% (D) 95%
7	Tinical is a mineral of (A) Al (B) B (C) Si (D) C
8	For which mechanism the first step involved is the same : (A) $E1$ and $E2$ (B) $E2$ and S_N2 (C) S_N1 and S_N2 (D) $E1$ and S_N1
9	Which of the following is not a fatty acid : (A) Propanoic acid (B) Butyric acid (C) Valeric acid (D) Phthalic acid
10	Which one of the following is a typical transition metal : (A) Sc (B) Y (C) Ra (D) Co
11	Which of the following sulphates is not soluble in water : (A) Sodium sulphate (B) Potassium sulphate (C) Zinc sulphate (D) Barium sulphate
12	Linear shape is associated with which set of hybrid orbitals : (A) sp (B) sp^2 (C) sp^3 (D) dsp^2
13	Which halogen occurs in a positive oxidation state : (A) Fluorine (B) Chlorine (C) Bromine (D) Iodine
14	The electrophile in aromatic sulphonation is : (A) H_2SO_4 (B) HSO_4 (C) SO_3 (D) SO_3^+
15	Laughing gas is chemically : (A) NO (B) N_2O (C) NO_2 (D) N_2O_5
16	The carbon atom of a carboxyl group is hybridized : (A) sp (B) sp^2 (C) sp^3 (D) dsp^2
17	Which acid is used in the manufacture of synthetic fibre : (A) Formic acid (B) Oxalic acid (C) Carbonic acid (D) Acetic acid

Roll No _____ **Lahore Board-2021** (To be filled in by the candidate)

(Academic Sessions 2017 – 2019 to 2019 – 2021)

CHEMISTRY

221-(INTER PART – II)

Time Allowed : 2.40 hours

PAPER – II (Essay Type)

GROUP – I

Maximum Marks : 68

SECTION – I

2. Write short answers to any EIGHT (8) questions :

16

- (i) Why the ionic radii of negative ions are larger than the size of their parent atoms?
- (ii) Why the graphite is a good conductor?
- (iii) Complete and balance the equations : (a) $LiNO_3 \xrightarrow{Heat}$ (b) $NaNO_3 \xrightarrow{Heat}$
- (iv) Why the aqueous solution of Na_2CO_3 is alkaline in nature?
- (v) Give the chemical formulae of : (a) Kaolin (b) Feldspar
- (vi) Give the four differences of boron from other elements of group IIIA.
- (vii) Give four uses of borax.
- (viii) Give four similarities of sulphur and oxygen.
- (ix) Give four uses of sulphuric acid.
- (x) Mention any four qualities of a good fertilizer.
- (xi) Give the composition of a good Portland cement.
- (xii) Define the term ' setting of cement '. Also describe reactions taking place in first 24-hours?

3. Write short answers to any EIGHT (8) questions :

16

- (i) Oxidizing power of halogen depends upon which factors.
- (ii) What do you know about disproportionation reactions? Give example.
- (iii) Give two uses of bleaching powder.
- (iv) What are interstitial compounds?
- (v) What is anode coating?
- (vi) Give four examples of ortho-para directing groups.
- (vii) Discuss catalytic oxidation of benzene.
- (viii) What is iodoform test? Give its uses.
- (ix) What do you know about silver mirror test?
- (x) How would you prepare carboxylic acids from Grignard Reagents?
- (xi) How would you prepare acid anhydride from acetic acid?
- (xii) Why first four members of aliphatic acids are soluble in water?

4. Write short answers to any SIX (6) questions :

12

- (i) What are homocyclic and heterocyclic compounds? Give one example of each.
- (ii) Write the structural formulas of two possible isomers of C_4H_{10} .
- (iii) How is methane converted to ethane?
- (iv) Ozonolysis of alkene is used to locate the position of double bond, comment.
- (v) Why is sigma bond inert?

Note : Four possible answers A, B, C and D to each question are given. The choice which you think is correct, fill that circle in front of that question with Marker or Pen ink in the answer-book. Cutting or filling two or more circles will result in zero mark in that question.

1-1	Mark the correct statement : (A) All lanthanides are present in the same group (B) All halogens are present in the same period (C) All the alkali metals are present in the same group (D) All the noble gases are present in the same period
2	Which ion will have maximum value of heat of hydration : (A) Na^+ (B) Cs^{+1} (C) Ba^{+2} (D) Mg^{+2}
3	Which element forms an ion with charge +3 : (A) Be (B) Al (C) C (D) Si
4	Laughing gas is chemically : (A) N_2O_4 (B) N_2O_2 (C) N_2O (D) NO
5	Which halogen will react spontaneously with Au(s) to produce Au^{3+} : (A) Br_2 (B) I_2 (C) Cl_2 (D) F_2
6	Chlorine heptaoxide reacts with water to form : (A) $HClO$ (B) $HClO_4$ (C) $HClO_3$ (D) $HClO_2$
7	The strength of binding energy of transition elements depends upon : (A) Number of electron pairs (B) Number of unpaired electrons (C) Number of neutrons (D) Number of protons
8	Select from the following which one is an alcohol : (A) CH_3-O-CH_3 (B) CH_3-CH_2-OH (C) CH_3COOH (D) CH_3-CH_2-Br
9	Formula of chloroform is : (A) CH_3Cl (B) CCl_4 (C) CH_2Cl_2 (D) $CHCl_3$
10	During nitration of benzene, the active nitrating agent is : (A) NO_3 (B) NO_2 (C) NO_2^+ (D) HNO_3
11	Elimination bimolecular reactions involve : (A) First order kinetics (B) Second order kinetics (C) Third order kinetics (D) Zero order kinetics
12	Ethanol can be converted into ethanoic acid by : (A) Hydrogenation (B) Oxidation (C) Hydration (D) Distillation
13	Which of the following reagents will react with both aldehydes and ketones : (A) Tollen's reagent (B) Fehling's solution (C) Grignard's reagent (D) Benedict solution
14	Ketones are prepared by the oxidation of : (A) Primary alcohol (B) Tertiary alcohol (C) Secondary alcohol (D) All of these
15	Which of the following is not a fatty acid : (A) Propanoic acid (B) Acetic acid (C) Phthalic acid (D) Butanoic acid
16	Rectified spirit contains ethyl alcohol : (A) 80% (B) 85% (C) 90% (D) 95%
17	Which is not a calcareous material : (A) Lime (B) Clay (C) Marble (D) Marine shell

Roll No _____ **Lahore Board-2021** (To be filled in by the candidate)

(Academic Sessions 2017 – 2019 to 2019 – 2021)

CHEMISTRY

221-(INTER PART – II)

PAPER – II (Essay Type)

GROUP – II

Time Allowed : 2.40 hours

Maximum Marks : 68

SECTION – I



2. Write short answers to any EIGHT (8) questions :

16

- (i) What do you know about period 6 of the periodic table?
- (ii) Why Na^+ is smaller than Na atom?
- (iii) What are alkali metals? Give name of alkali metals.
- (iv) Give two differences between lithium and other alkali metals.
- (v) Give chemical formulas of mica and bauxite.
- (vi) How would you prepare borax from colemanite?
- (vii) Give two uses of aluminium.
- (viii) Draw structural formulas of dinitrogen pentoxide and dinitrogen oxide.
- (ix) "Sulphuric acid is a dehydrating agent". Justify.
- (x) Write different steps involved in the manufacturing of urea.
- (xi) Why potassium fertilizers are important for plants?
- (xii) What reactions take place between 1 to 7 days during setting of cement?

3. Write short answers to any EIGHT (8) questions :

16

- (i) Write any two uses of bleaching powder.
- (ii) What is disproportionation reaction? Give one example.
- (iii) Why HF is weaker acid than HCl?
- (iv) Why does damaged tin plated iron get rusted quickly?
- (v) Give the prevention of metals from corrosion.
- (vi) What are polycyclic aromatic hydrocarbons? Give examples.
- (vii) What information do we get from X-ray study of benzene?
- (viii) How does formaldehyde react with the following reagent : (a) HCN (b) $NaHSO_3$
- (ix) How will you distinguish between methanal and ethanal?
- (x) Write any two reactions of carboxylic acids in which hydrogen atom of carboxylic group is involved.
- (xi) What is meant by oxidative cleavage of alkenes? Give an example.
- (xii) Write down the mechanism of ester formation.

4. Write short answers to any SIX (6) questions :

12

- (i) Define catalytic cracking.
- (ii) Define homocyclic and heterocyclic compounds.
- (iii) Define hydrogenolysis. Give one example.
- (iv) Why sigma bond is inert?
- (v) How are cis and trans alkenes prepared from alkyne?

(Turn Over)

CHEMISTRY

219-(INTER PART – II)

Time Allowed : 20 Minutes

Q.PAPER – II (Objective Type)

GROUP – I

Maximum Marks : 17

PAPER CODE = 8487

Note : Four possible answers A, B, C and D to each question are given. The choice which you think is correct, fill that circle in front of that question with Marker or Pen ink in the answer-book. Cutting or filling two or more circles will result in zero mark in that question.

1-1	The fibre which is made from acrylonitrile as monomer : (A) PVC (B) Rayon fibre (C) Acrylic fibre (D) Polyester fibre
2	Vinyl acetylene combines with HCl to form : (A) Chloroprene (B) Benzene (C) Poly acetylene (D) Divinyl acetylene
3	Hydrogen bond is the strongest between the molecules of : (A) HCl (B) HBr (C) HI (D) HF
4	Which enzyme is not involved in fermentation of starch : (A) Urease (B) Zymase (C) Invertase (D) Diastase
5	Aromatic hydrocarbons are the derivatives of : (A) Alkene (B) Benzene (C) Cyclohexene (D) Normal series of paraffins
6	Chile saltpetre has the chemical formula : (A) $NaNO_3$ (B) KNO_2 (C) $Na_2B_4O_7$ (D) $Na_2CO_3 \cdot H_2O$
7	The pH range of the acid rain is : (A) 7 – 6.5 (B) 6.5 – 6 (C) 6 – 5.6 (D) Less than 5
8	The percentage of carbon in different type of iron products is in the order of : (A) Cast iron > wrought iron > steel (B) Wrought iron > steel > cast iron (C) Cast iron > steel > wrought iron (D) Cast iron = steel > wrought iron
9	Which acid is used in the manufacture of synthetic fibre : (A) Formic acid (B) Acetic acid (C) Oxalic acid (D) Carbonic acid
10	Mark the correct statement : (A) Na^+ is smaller than Na atom (B) Na^+ is larger than Na atom (C) Cl^- is smaller than Cl atom (D) Cl^- (ion) and Cl (atom) are equal in size
11	Elimination bimolecular reactions involve : (A) Zero order reactions (B) First order reactions (C) Second order reactions (D) Third order reactions
12	Boric acid cannot be used : (A) An antiseptic in medicine (B) For washing eyes (C) In soda bottles (D) For enamels and glazes
13	Which of these polymers is an addition polymer : (A) Nylon – 6, 6 (B) Polystyrene (C) Terylene (D) Epoxy resin
14	Which of the following will have the highest boiling point : (A) Methanal (B) Ethanal (C) Propanal (D) 2-Hexanone
15	Which woody raw material is used for the manufacture of paper pulp : (A) Cotton (B) Bagasse (C) Poplar (D) Rice straw
16	Which set of hybrid orbitals has planar triangular shape : (A) dsp^2 (B) sp^3 (C) sp^2 (D) sp
17	Laughing gas is chemically : (A) NO (B) N_2O (C) NO_2 (D) N_2O_4

SECTION – I



2. Write short answers to any EIGHT (8) questions :

16

- (i) Define periodic table. How many groups and periods are present in it?
- (ii) Define (i) Mendelcev's periodic law (ii) Modern periodic law.
- (iii) Differentiate between alkali metals and alkaline earth metals. Give one example in each case.
- (iv) Write down the formulas of the following minerals : (i) Borax (ii) Colemanite
- (v) Write down four uses of borax.
- (vi) Define chemical garden.
- (vii) Write down two similarities and two dissimilarities of oxygen and sulphur.
- (viii) Write four differences of nitrogen from its family.
- (ix) Why does aqua regia dissolve gold and platinum?
- (x) Write down four essential qualities of a good fertilizer.
- (xi) What are raw materials for the manufacture of cement?
- (xii) Define environmental chemistry. Name components of environment.

3. Write short answers to any EIGHT (8) questions :

16

- (i) Define organic chemistry. What is vital force theory?
- (ii) Write down structural formulas of the following :
 (a) 2-Methyl propanoic (b) Neopentane (c) 3-Ethyl pentane (d) 2,2 – Dimethyl pentane
- (iii) Write down four uses of methane.
- (iv) Define aromatic hydrocarbons. How they are classified?
- (v) What happens when (a) Benzene is heated with conc. H_2SO_4 at $250^\circ C$.
 (b) Chlorine is passed through benzene in sunlight.
- (vi) Define alkyl halides. What are primary alkyl halides? Give one example.
- (vii) Define Grignard reagent. Give one example.
- (viii) How ethanal is prepared from Molasses? Write chemical reaction as well.
- (ix) Define : (a) Absolute alcohol (b) Methylated spirit (c) Rectified spirit.
 (d) Denaturing of alcohol.
- (x) Write down the structural formulae of the following :
 (a) Propanoic acid (b) Oxalic acid (c) Benzoic acid (d) Acetic anhydride
- (xi) How acetic acid is converted into the methane?
- (xii) Define amino acids. Give two examples.

4. Write short answers to any SIX (6) questions :

12

- (i) What is iodized salt?
- (ii) Why iodine has metallic luster?
- (iii) Give four applications of noble gases.
- (iv) What are interstitial compounds?
- (v) How will you convert ethanal into lactic acid?

(Turn Over)

Lahore Board-2019

(2)

4. (vi) How will you distinguish between ethanal and benzaldehyde? Give respective chemical reaction.
- (vii) How is polyvinyl chloride prepared and give its uses?
- (viii) How is nylon – 6, 6 prepared?
- (ix) What is function of DNA and RNA?

SECTION – II

Note : Attempt any **THREE** questions.

5. (a) Write eight points to describe role of lime in industries. 4
- (b) What are hydrides, describe different types of hydrides? 4
6. (a) Define corrosion. Explain electrochemical theory of corrosion. 4
- (b) How water is disinfected by chlorine? Write down harmful effects of chlorination of water. 4
7. (a) What is orbital hybridization? Explain sp^3 hybridization with an example. 4
- (b) Discuss atomic orbital treatment to explain structure of benzene. 4
8. (a) How can following conversions be carried out : 4
- (i) Ethane \rightarrow Methane (ii) Methane \rightarrow Ethane
- (b) How can ethers be prepared by Williamsons method and from Ag_2O ? 2,2
9. (a) How does ethyl magnesium bromide react with : 4
- (i) CO_2 (ii) H_3C-CHO (iii) H_2O (iv) CH_3OH
- (b) Describe with mechanism aldol condensation reaction. 4

191-219-I-(Essay Type)-41000

CHEMISTRY

219-(INTER PART – II)

Time Allowed : 20 Minutes

Q.PAPER – II (Objective Type)

GROUP – II

Maximum Marks : 17

PAPER CODE = 8488

Note : Four possible answers A, B, C and D to each question are given. The choice which you think is correct, fill that circle in front of that question with Marker or Pen ink in the answer-book. Cutting or filling two or more circles will result in zero mark in that question.

1-1	Which of these polymers is a synthetic polymer : (A) Animal fat (B) Starch (C) Cellulose (D) Polyester
2	When 1-chloropropane is reacted with alcoholic KOH, the product obtained is : (A) Propane (B) Propene (C) Propyne (D) Butane
3	The strongest acid in halogen acids in solution is : (A) HF (B) HCl (C) HBr (D) HI
4	Which is more soluble compound in H_2O : (A) 1-Propanol (B) Methanol (C) Phenol (D) n-Hexanol
5	Molecular formula of benzyl chloride is : (A) $H_5C_6CCl_3$ (B) $H_5C_6HCl_2$ (C) $H_5C_6CH_2Cl$ (D) $H_5C_6CH_2.CH_2Cl$
6	Which one of the following elements is not alkali metal : (A) Na (B) Sr (C) Cs (D) Fr
7	Peroxyacetylnitrate is an irritant to human beings and its effects : (A) Eyes (B) Ears (C) Stomach (D) Nose
8	Oxidation state of Cu in $K_2[Cu(CN)_4]$ is : (A) +4 (B) +3 (C) +2 (D) +6
9	The reagent used to reduce carboxylic group into an alcohol is : (A) H_2/Pt (B) H_2/Ni (C) $NaBH_4$ (D) $LiAlH_4$
10	Which one of the following oxides is more basic : (A) BeO (B) SrO (C) CaO (D) MgO
11	Which one of the following is not a nucleophile : (A) BCl_3 (B) NH_3 (C) H_2S (D) H_2O
12	The chief ore of aluminium is : (A) Al_2O_3 (B) $Al_2O_3.H_2O$ (C) $Al_2O_3.2H_2O$ (D) Na_3AlF_6
13	Which one of the following elements is not present in all proteins : (A) Carbon (B) Hydrogen (C) Nitrogen (D) Sulphur
14	The compound which reacts with Tollen's reagent : (A) HCHO (B) $H_3C.CO.CH_3$ (C) $H_3C.COOH$ (D) $H_3C.CO.C_2H_5$
15	Woody raw material used for manufacturing of paper pulp is : (A) Poplar (B) Rice straw (C) Bagasse (D) Cotton
16	The state of hybridization of carbon in ethylene is : (A) sp^3 (B) sp^2 (C) sp (D) dsp^2
17	Which one of the following species has two unpaired electrons : (A) O_2 (B) O_2^{1+} (C) O_2^{1-} (D) O_2^{2-}

SECTION – I

2. Write short answers to any EIGHT (8) questions :



16

- (i) What is hydration energy? Give an example.
- (ii) Why diamond is a non-conductor but graphite is a fairly good conductor?
- (iii) How are lime and sand used to make glass?
- (iv) How does orthoboric acid react with : (a) Sodium hydroxide (b) Ethyl alcohol
- (v) Why is CO_2 a gas at room temperature while SiO_2 is a solid?
- (vi) Why are borate glazes preferred over silicate glazes?
- (vii) H_2SO_4 is a powerful dehydrating agent. Prove it giving two examples.
- (viii) Why does aqua regia dissolve gold and platinum?
- (ix) Write two similarities of oxygen and sulphur.
- (x) What do you mean by prilling of urea?
- (xi) State the reactions that take place during first 24 hours by the setting of cement.
- (xii) How are detergents threat to aquatic animal life?

3. Write short answers to any EIGHT (8) questions :

16

- (i) How coal is produced from remain of trees?
- (ii) Write structural formulas of : (a) 1,3-Butadiene (b) Vinyl bromide
- (iii) State Markownikov's rule and give an example.
- (iv) Write down the structural formulas of : (a) Biphenyl (ii) Diphenylmethane
- (v) How the cyclic structure of benzene got verified?
- (vi) Write down any two methods of preparation of alkyl halides.
- (vii) What is Grignard's reagent? How is it prepared?
- (viii) Absolute alcohol cannot be prepared by fermentation process. Give justification.
- (ix) How can you distinguish between methanol and ethanol?
- (x) What are essential and non-essential amino acids?
- (xi) How will you carry out following conversion :
Acetic acid into acetone.
- (xii) Write down the name and the structural formulas of two acidic amino acids.

4. Write short answers to any SIX (6) questions :

12

- (i) Which halogen sublimes as violet vapours?
- (ii) Write reaction of Cl_2 with cold and hot NaOH.
- (iii) Halogens act as oxidizing agents, justify.
- (iv) Give systematic name of $Na_3[CoF_6]$.
- (v) Write Fehling's solution test.

(Turn Over)

Lahore Board-2019

(2)

4. (vi) How will you distinguish between ethanal and propanal?
(vii) What are polysaccharides?
(viii) Glycogen is called animal starch, give reason.
(ix) What is meant by denaturation of protein?

SECTION – II

Note : Attempt any THREE questions.

5. (a) Write similarities and differences of halogens with hydrogen. 4
(b) Complete and balance the following equations. 4
(i) $Mg(NO_3)_2 \xrightarrow{\text{Heat}}$ (ii) $Ca(OH)_2 + SiO_2 \rightarrow$
(iii) $Be + O_2 \rightarrow$ (iv) $Be + NaOH \rightarrow$
6. (a) How will you prepare steel by Bessemer's process? 4
(b) What is acid rain, how does it affect our environment? 4
7. (a) What is meant by orbital hybridization? Explain sp hybridization with an example. 4
(b) Draw structural formulae for the following compounds : 4
(i) m-Chlorobenzoic acid (ii) 2, 4, 6-Trinitrotoluene
(iii) p-Dibenzylbenzene (iv) p-Nitroaniline
8. (a) How would you prepare alkanes from carboxyl compounds? 4
(b) Discuss the acidic behaviour of phenol. 4
9. (a) Write a note on oxidation of aldehydes and ketones. 4
(b) Define β -Elimination reactions. Discuss in detail E1 reaction with mechanism. 4

228-219-II-(Essay Type)-23000



CHEMISTRY

218-(INTER PART – II)

Time Allowed : 20 Minutes

Q.PAPER – II (Objective Type)

GROUP – I

Maximum Marks : 17

PAPER CODE = 8483

Note : Four possible answers A, B, C and D to each question are given. The choice which you think is correct, fill that circle in front of that question with Marker or Pen ink in the answer-book. Cutting or filling two or more circles will result in zero mark in that question.

1-1	The anhydride of $HClO_4$ is : (A) ClO_3 (B) ClO_2 (C) Cl_2O_5 (D) Cl_2O_7
2	During nitration of benzene, the active nitrating agent is : (A) NO_3 (B) NO_2^+ (C) NO_2^- (D) HNO_3
3	Which one of these polymers is a synthetic polymer : (A) Animal fat (B) Starch (C) Cellulose (D) Polyester
4	The main pollutant of leather tanneries in the waste water is due to the salts of : (A) Lead (B) Chromium (VI) (C) Copper (D) Chromium (III)
5	Keeping in view the size of atoms, which order is the correct one : (A) $Mg > Sr$ (B) $Ba > Mg$ (C) $Lu > Ce$ (D) $Cl > I$
6	Formalin is : (A) 10% solution of formaldehyde in water (B) 20% solution of formaldehyde in water (C) 40% solution of formaldehyde in water (D) 60% solution of formaldehyde in water
7	Tinical is a mineral of : (A) Al (B) B (C) Si (D) C
8	Which enzyme is not involved in fermentation of starch : (A) Diastase (B) Zymase (C) Urease (D) Maltase
9	Peroxyacetylnitrate (PAN) is an irritant to human beings and it affects : (A) Eyes (B) Ears (C) Stomach (D) Nose
10	Which set of hybrid orbitals has planer triangular shape : (A) dsp^2 (B) sp^3 (C) sp^2 (D) sp
11	Which one of the following is not an alkali metal : (A) Fr (B) Cs (C) Rb (D) Ra
12	Preparation of vegetable ghee involves : (A) Halogenation (B) Hydrogenation (C) Hydroxylation (D) Dehydrogenation
13	Co-ordination number of pt in $[ptCl(NO_2)(NH_3)_4]$ is : (A) 2 (B) 4 (C) 1 (D) 6
14	For which mechanism, the first step involved is the same : (A) E_1 and E_2 (B) E_2 and S_N2 (C) S_N1 and E_2 (D) E_1 and S_N1
15	Which catalyst is used in contact process for preparing H_2SO_4 : (A) Fe_2O_3 (B) V_2O_5 (C) SO_3 (D) Ag_2O
16	Which of the following is not a fatty acid : (A) Propanoic acid (B) Acetic acid (C) Phthalic acid (D) Butanoic acid
17	Micro-nutrients are required in quantity ranging from : (A) 4 – 40 g (B) 6 – 200 g (C) 6 – 200 kg (D) 4 – 40 kg

SECTION – I**2. Write short answers to any EIGHT (8) questions :****16**

- (i) Why diamond is a non-conductor and graphite is fairly a good conductor?
- (ii) The hydration energy of the ions are in the order, justify it : $Al^{+3} > Mg^{+2} > Na^{+1}$
- (iii) Why lime water turns milky with CO_2 but becomes/ ^{clear} with excess of CO_2 .
- (iv) Give any four uses of "Al".
- (v) What happens when ortho boric acid reacts with : (i) NaOH (ii) Ethyl alcohol
- (vi) What is vitreous silica, give its two uses?
- (vii) NO_2 is a strong oxidizing agent, prove with the help of two reactions.
- (viii) Give two reactions of H_2SO_4 which show its oxidizing behaviour.
- (ix) Give four dissimilarities of oxygen and sulphur.
- (x) What is BOD?
- (xi) What is the role of chlorofluorocarbons in destroying ozone?
- (xii) Explain cis-trans isomerism, give one example.

3. Write short answers to any EIGHT (8) questions :**16**

- (i) Define ligand with an example.
- (ii) What is the percentage (%) of carbon in different types of steel?
- (iii) Why alkanes are less reactive organic compounds?
- (iv) Convert : (a) Acetylene \rightarrow Benzene (b) Vinyl acetylene \rightarrow Chloroprene
- (v) What is meant by nitration of benzene? Write its reaction.
- (vi) What do you mean by leaving group? Give an example.
- (vii) What is denaturing of alcohol?
- (viii) How Lucas test is used to distinguish between primary, secondary and tertiary alcohol?
- (ix) Write any four uses of acetaldehyde.
- (x) How iodoform test can be used to distinguish methyl ketones from other ketones?
- (xi) What is the difference between essential and non-essential amino acids?
- (xii) How acetic acid reacts with : (a) PCl_3 (b) $SOCl_2$

4. Write short answers to any SIX (6) questions :**12**

- (i) What is denaturation of proteins?
- (ii) What are thermosetting polymers?
- (iii) What is acid number?
- (iv) What is clinker formation?
- (v) Name two woody and two non-woody raw materials.
- (vi) Give significance of potash fertilizer.

Lahore Board-2018

(2)

4. (vii) Write down the reactions of chlorine with cold and hot NaOH.
(viii) Write two uses of each helium and argon.
(ix) Why iodine has metallic luster?

SECTION – II

Note : Attempt any **THREE** questions.

5. (a) How do you justify the position of hydrogen at the top of IA and VIIA groups of periodic table? 4
(b) Describe the manufacturing of Na metal by Down's cell, give advantages of this process. 4
6. (a) Explain the following properties of transition elements : 4
(i) Colour (ii) Chelate formation.
(b) Explain the process of incineration of industrial waste. 4
7. (a) Define cracking and give its types. 4
(b) Write down the classification of aromatic hydrocarbons giving one example each. 4
8. (a) How is ethane prepared by Kolbe's electrolytic method? Write its mechanism. 4
(b) Write two methods of preparation of phenol. 4
9. (a) Give the four points of difference between S_N1 and S_N2 reactions. 4
(b) What type of aldehydes give Cannizzaro's reaction? Give its mechanism. 4

CHEMISTRY

218-(INTER PART – II)

Time Allowed : 20 Minutes

Q.PAPER – II (Objective Type)

GROUP – II

Maximum Marks : 17

PAPER CODE = 8484

Note : Four possible answers A, B, C and D to each question are given. The choice which you think is correct, fill that circle in front of that question with Marker or Pen ink in the answer-book. Cutting or filling two or more circles will result in zero mark in that question.

1-1	Which is the weakest oxidizing agent : (A) Br_2 (B) Cl_2 (C) F_2 (D) I_2
2	Which one of the following species is an electron releasing : (A) $-CHO$ (B) $-C(=O)-R$ (C) $-OH$ (D) $-COOH$
3	Which one of the following nitrogenous base is not present in RNA : (A) Thiamine (B) Cytosine (C) Adenine (D) Uracil
4	Fungicides are used to : (A) Control the growth of fungus (B) Kill insects (C) Kill plants (D) Kill herbs
5	Which one of the following oxides is more acidic : (A) MnO (B) Mn_2O_3 (C) MnO_2 (D) Mn_2O_7
6	Which one of the following compounds will not give iodoform test : (A) Ethanol (B) Acetaldehyde (C) Butanone (D) 3-Pentanone
7	Bauxite is an ore of : (A) B (B) Al (C) Mg (D) Ca
8	Which one of the following compounds is more acidic : (A) H_3C_6OH (B) H_2O (C) H_3C_2OH (D) H_3CCOOH
9	In purification of potable water the coagulant used is : (A) Nickel sulphate (B) Alum (C) Copper sulphate (D) Barium sulphate
10	For a ketone having molecular formula $C_5H_{10}O$, the number of possible metamers are : (A) 2 (B) 3 (C) 4 (D) 5
11	Formula of sodium beryllate is : (A) $Na_2B_4O_7$ (B) Na_2BeO_2 (C) $BeONa$ (D) $Na_2B_4O_7 \cdot 10H_2O$
12	Addition of water to acetylene takes place in presence of : (A) Ni (B) $HgSO_4 / H_2SO_4$ (C) $ZnCl_2$ (D) Cu
13	Which one of the following is a non-typical transition element : (A) Cr (B) Mn (C) Cd (D) Fe
14	When ethyl magnesium bromide reacts with HCHO followed by acid hydrolysis, the product formed is : (A) Ethanol (B) 1-Propanol (C) Ethanoic acid (D) 2-Propanol
15	The lowest ionization energy is possessed by : (A) P (B) N (C) Sb (D) As
16	The solution of which acid is used for seasoning of food : (A) Formic acid (B) Acetic acid (C) Benzoic acid (D) Butanoic acid
17	Ammonium nitrate fertilizer is not used for which crop : (A) Cotton (B) Wheat (C) Sugar cane (D) Paddy rice

SECTION – I

2. Write short answers to any EIGHT (8) questions :



16

- (i) Why is the oxidation state of noble gases usually zero?
- (ii) Why does the ionization energy decrease down the group and increase along the period?
- (iii) Why is the aqueous solution of Na_2CO_3 alkaline in nature?
- (iv) Write two reactions of preparation of borax.
- (v) What is chemical garden?
- (vi) Define semiconductors. Write its two properties.
- (vii) Write two reactions of preparation of nitrous acid.
- (viii) What is the action of heat on orthophosphoric acid? Write chemical equation also.
- (ix) Write four physical properties of sulphuric acid.
- (x) Name the four components of environment.
- (xi) What is meant by dissolved oxygen (DO) to check the quality of water?
- (xii) Write the destructive distillation of coal.

3. Write short answers to any EIGHT (8) questions :

16

- (i) $KMnO_4$ acts as oxidizing agent, show with two examples.
- (ii) What are chelates? Give one example.
- (iii) What is the statement of Markownikov's rule? Also give example.
- (iv) What happens when vic-dihalide is treated with Zn-dust?
- (v) What happens when benzene is burnt in free supply of air? Write equation.
- (vi) Describe the best method for preparation of alkyl halides.
- (vii) How phenol can be converted into benzene?
- (viii) How does phenol react with bromine water?
- (ix) What are aldehydes and ketones, give example?
- (x) How formaldehyde is prepared on large scale?
- (xi) How carboxylic acid can be obtained from alkene?
- (xii) Why does mostly carboxylic acid exist as dimers?

4. Write short answers to any SIX (6) questions :

12

- (i) Why is cement named as Portland cement?
- (ii) Write about digestion process for preparation of pulp.
- (iii) Define DAP. Write reaction for its preparation.
- (iv) What is difference between fat and oil?
- (v) Write note on condensation polymer.
- (vi) Define iodine number and acid number.

Lahore Board-2018

(2)

4. (vii) How NaOH reacts with Cl_2 in hot and cold state?
(viii) What is iodized salt? Write its function.
(ix) Give reason oxidation power of halogens increases $F_2 > Cl_2 > Br_2 > I_2$

SECTION – II

Note : Attempt any THREE questions.

5. (a) Define ionization energy. Give its units. Discuss the effects of three factors on the ionization energy values of elements. 4
(b) Explain the peculiar behaviour of beryllium. 4
6. (a) Describe the manufacture of wrought iron from cast iron. 4
(b) Describe the natural and human sources of nitrogen oxides and sulphur oxides. 4
7. (a) Differentiate between homocyclic and heterocyclic compounds with two examples each. 4
(b) Write down two reactions in which benzene behaves as saturated hydrocarbon and two reactions in which benzene behaves as unsaturated hydrocarbon. 4
8. (a) What are rules for naming alkynes? Explain with suitable examples. 4
(b) Write down Dow's method for preparing phenol. What is action of following on phenol : 4
(i) Bromine water. (ii) HNO_3 at different temperatures.
9. (a) How will you bring about the following conversions from an alkyl halide : 4
(i) Diethyl ether (ii) Ethyl thioalcohol (iii) Ethyl acetate (iv) Nitroethane
(b) What type of aldehydes give Cannizzaro's reaction? Give its reaction mechanism. 4



228-218-II-(Essay Type)-18500