



CHEMISTRY		TIME : 20 MINUTES
GROUP : FIRST		MARKS :17

OBJECTIVE

NOTE: You have four choices for each objective type question as A , B , C and D . The choice which you think is correct, fill that circle in front of that question number. Use marker or pen to fill the circles. Cutting or filling two or more circles will result in zero marks in that question.

QUESTION NO. 1

- Planar triangular shape is associated with which set of hybrid orbitals
(A) sp^3 (B) sp (C) sp^2 ● (D) dsp^2
- Formula of chloroform is
(A) CH_3Cl (B) CCl_4 (C) CH_2Cl_2 (D) $CHCl_3$ ●
- During nitration of benzene , the active nitrating agent is
(A) NO_3 (B) NO_2^+ (C) NO_2 ● (D) HNO_3
- When Ethanol ($CH_3 - CH_2 - OH$) is made to react with ethyl magnesium bromide the product formed is
(A) CH_4 (B) $CH_2 = CH_2$ (C) C_2H_2 (D) $CH_3 - CH_3$ ●
- Which compound is called a universal solvent ?
(A) H_2O ● (B) CH_3OH (C) C_2H_5OH (D) $CH_3 - O - CH_3$
- One of the following compounds will react with Tollen's reagent.
(A) $CH_3 - \overset{\overset{O}{\parallel}}{C} - H$ ● (B) $CH_3 - \overset{\overset{O}{\parallel}}{C} - CH_3$ (C) $CH_3 - \overset{\overset{O}{\parallel}}{C} - OH$ (D) $CH_3 - \overset{\overset{O}{\parallel}}{C} - CH_2 - CH_3$
- One of the following is not a fatty acid
(A) Acetic acid (B) Propanoic acid (C) Butanoic acid (D) Phthalic acid ●
- Which one of the following enzymes brings about the hydrolysis of fats ?
(A) Urease (B) Maltase (C) Lipase ● (D) Zymase
- Which is not a calcareous material ?
(A) Lime (B) Clay ● (C) Marble (D) Marine Shell
- Disinfection of chlorine is
(A) Inexpensive (B) Expensive (C) Rapid ● (D) Slow
- Ecosystem is a smaller unit of
(A) Lithosphere (B) Hydrosphere (C) Atmosphere (D) Biosphere ●
- Select the two normal elements are present in Fifth period
(A) Rb , Sr ● (B) Cs , Ba (C) Fr , Ra (D) La , Hf
- The mineral ($CaSO_4 \cdot 2H_2O$) has the general name
(A) Gypsum ● (B) Dolomite (C) Calcite (D) Epsom salt
- One of the element forms an ion with charge 3+
(A) Beryllium (B) Aluminium ● (C) Carbon (D) Silicon
- Choose the gas which is obtained by the reaction of Formic acid with conc: H_2SO_4
(A) C_2H_2 (B) C_2H_4 (C) CO_2 ● (D) CO
- One of the halogen occurs naturally in a positive oxidation state
(A) Fluorine (B) Chlorine (C) Iodine ● (D) Bromine
- Group VI – B of transition elements contains
(A) Zn , Cd , Hg (B) Cr , Mo , W ● (C) Fe , Ru , Os (D) Mn , Te , Re

CHEMISTRY		TIME: 2 HRS 40 MINUTES
GROUP : FIRST		MARKS: 68
SUBJECTIVE PART		
SECTION – I		

QUESTION NO. 2 Write short answers any Eight (8) of the following **16**

i	Why alkali metals are very reactive ?
ii	What are the s – block elements and why are they called so ?
iii	How do transition elements display colours ?
iv	K ₂ CrO ₄ and K ₂ Cr ₂ O ₇ show similar properties. Justify this.
v	How does brown pulp converted into white pulp in paper industry ?
vi	Give formula of (i) Dolomite (ii) Natron
vii	What will happen when Lithium Hydride is treated with water.
viii	Starting from (primary) alkyl halide prepare ethylamine
ix	How the molecular mass of polymer is determined ?
x	What is starch ? Write its two uses.
xi	What are lipids ? What is their importance ?
xii	How Grignard reagent react with CH ₃ CHO ?



QUESTION NO. 3 Write short answers any Eight (8) of the following **16**

i	Why is SO ₃ dissolved in H ₂ SO ₄ and not in H ₂ O ?
ii	Write down any four uses of HNO ₃
iii	What are Freons and Teflon ?
iv	Write down any four applications of noble gases.
v	What are alicyclic compounds ? Give its two examples.
vi	Define knocking. How does it improve ?
vii	How formaldehyde is prepared from ethene ?
viii	How acetylene is prepared on industrial scale ?
ix	Why alkanes are less reactive ?
x	Differentiate between oxidizing and reducing smog.
xi	How chlorofluorocarbons destroy ozone ?
xii	What is dissolved oxygen ?

QUESTION NO. 4 Write short answers any Six (6) of the following **12**

i	What is the Chemistry of Borax – bead Test ?
ii	Write down any two uses of Aluminium.
iii	Why are liquid silicones preferred over ordinary organic lubricants ?
iv	What are the major products of bromination of the following compounds? (a) Toluene (b) Benzaldehyde
v	Ethanol gives different products with conc H ₂ SO ₄ under different conditions , give reactions.
vi	Write IUPAC names of the following compounds. (a) (CH ₃) ₂ CH – OH (b) (CH ₃) ₂ CHCH ₂ OH
vii	Why formaldehyde does not give aldol condensation reaction ?
viii	What is internal salt of amino acids ?
ix	Write down the reaction of acetic acid with ammonia and its product on heating.

SECTION-II

Note: Attempt any Three questions from this section

8 x 3 = 24

Q.5.(A)	Discuss the position of hydrogen in a periodic table with IV A group elements.
(B)	How is sodium prepared commercially by Down's Cell ?
Q.6.(A)	Write down four uses of Chlorine in daily life.
(B)	Explain preparation of urea fertilizer on large scale.
Q.7.(A)	Define atomic orbital hybridization. Explain sp hybridization with formation of ethyne.
(B)	Explain the mechanism of SN ₁ reactions.
Q.8.(A)	How will you prepare from ethyne. (i) Acetaldehyde (ii) Oxalic acid (iii) Benzene (iv) chloroprene
(B)	How will you prepare from Acetaldehyde (i) Lactic acid (ii) Acetal
Q.9.(A)	Discuss the nitration of benzene with reaction mechanism.
(B)	How will you identify 1 – propanol , 2 – propanol and 2 – methyl – 2 – propanol ? Justify the answer with chemical test.

OBJECTIVE**NOTE:**

You have four choices for each objective type question as A, B, C and D. The choice which you think is correct, fill that circle in front of that question number. Use marker or pen to fill the circles. Cutting or filling two or more circles will result in zero marks in that question.

QUESTION NO. 1

- 1 Which of the following is not a fatty acid ?
(A) Propanoic acid (B) Acetic acid (C) Phthalic acid ● (D) Butanoic acid
- 2 A polymeric substance that is formed in a liquid state and then hardened to a rigid solid is called a
(A) Fibre (B) Plastic ● (C) Varnish (D) Polyamide resins
- 3 Which is not a calcareous material ?
(A) Lime (B) Clay ● (C) Marble (D) Marine shell
- 4 The main pollutant of leather tanneries in the waste water is due to the salt of
(A) Lead (B) Chromium (VI) ● (C) Copper (D) Chromium (III)
- 5 The capacity of organic matter in natural water to consume oxygen within a period of five days is called
(A) DO (B) BOD ● (C) COD (D) PAN
- 6 Coinage metals are
(A) Ni, Pd, Pt (B) Cu, Ag, Au ● (C) As, Al, Pd (D) Fe, Si, Sn
- 7 Which element is deposited at cathode during the electrolysis of brine in diaphragm cell ?
(A) H₂ ● (B) Na (C) Cl₂ (D) O₂
- 8 The chief ore of Aluminium is
(A) Na₃AlF₆ (B) Al₂O₃ · 2H₂O ● (C) Al₂O₃ (D) Al₂O₃ · H₂O
- 9 Nitrous acid reacts with aminobenzene to produce
(A) Urea (B) Phenol ● (C) Toluene (D) NH₃
- 10 Which of the following represents the correct electronic configuration of the outermost energy level of an element of zero (VIII A) group in the ground state ?
(A) s²p² (B) s²p⁴ (C) s²p⁵ (D) s²p⁶ ●
- 11 Coordination number of Pt in [PtCl(NO₂)(NH₃)₄] is
(A) 2 (B) 4 (C) 1 (D) 6 ●
- 12 Select from the following the one which is alcohol
(A) CH₃ - CH₂ - OH ● (B) CH₃ - O - CH₃ (C) CH₃COOH (D) CH₃ - CH₂ - Br
- 13 The formula of chloroform is
(A) CH₃Cl (B) CCl₄ (C) CH₂Cl₂ (D) CHCl₃ ●
- 14 During nitration of benzene, the active nitrating agent is
(A) NO₂ (B) NO₂⁺ ● (C) NO₂⁻ (D) HNO₃
- 15 Which reagent does not produce ethane by reacting with ethyl magnesium chloride in the presence of dry ether ?
(A) H₂O (B) NH₃ (C) HCHO ● (D) C₂H₅OH
- 16 Which compound will have maximum repulsion with water ?
(A) C₆H₆ ● (B) C₂H₅OH (C) CH₃OCH₃ (D) CH₃CH₂OH
- 17 Which of the following reagents will react with both aldehydes and ketones ?
(A) Grignard reagent ● (B) Fehling's reagent (C) Benedict's reagent (D) Tollen's reagent

CHEMISTRY		TIME: 2 HRS 40 MINUTES
GROUP : SECOND		SUBJECTIVE PART
	SECTION – I	MARKS: 68

QUESTION NO. 2 Write short answers any Eight (8) of the following 16

i	Why diamond is a non – conductor but graphite is a fairly good conductor ?
ii	Define ionization energy. How does it vary in the periodic table ?
iii	Why 2% gypsum is added to Cement ?
iv	Give the formula of (i) Asbestos (ii) Soapstone (Talc)
v	How does the process of galvanizing or Zinc Coating protect the iron from rusting ?
vi	How is the chromate ions converted into dichromate ions. Give the reaction involved.
vii	Give the two factors which govern the reactivity of alkyl halides.
viii	How propanoic acid is prepared from Ethyl magnesium Bromide ?
ix	What are thermoplastic polymers. Give two examples.
x	Define polysaccharides. Give two examples
xi	How the proteins are denatured ?
xii	Define lignin. Why is it removed from pulp ?



QUESTION NO. 3 Write short answers any Eight (8) of the following 16

i	Why the elements of Group VIA other than oxygen shows more than two oxidation states ?
ii	What is meant by Fuming Nitric acid ?
iii	Arrange F^- , Cl^- , I^- , Br^- in order of decreasing size.
iv	Name the Halogen used in water treatment.
v	Draw flow sheet diagram for the formation of Anthracite.
vi	Differentiate between petroleum and crude oil.
vii	How will you synthesize Acetaldehyde from C_2H_2 ?
viii	Compare the reactivity of ethane and ethene.
ix	Describe polymerization of ethene.
x	Define Biochemical Oxygen Demand (BOD) for the quality of water.
xi	Describe how pesticides are dangerous to humans ?
xii	Describe Reprocessing for the Recycling of Plastics.

QUESTION NO. 4 Write short answers any Six (6) of the following 12

i	What are semiconductors and name elements and compounds act as semiconductors ?
ii	Give four uses of Boric Acid.
iii	Justify that Boric Acid is monobasic Acid.
iv	What objections were raised on Kekule's structure for benzene molecule ?
v	How phenol is converted into Bakelite ?
vi	How Picric Acid is obtained from phenol ?
vii	What is Silver Mirror Test ?
viii	How would you convert acetic acid into acetic anhydride ?
ix	Discuss strecker synthesis for the preparation of amino acid.

SECTION-II

Note: Attempt any Three questions from this section

8 x 3 = 24

Q.5.(A)	What are hydrides ? Name their types. Give properties of ionic hydrides .	1+1+2
(B)	What are general trends of oxides and hydroxides of alkali and alkaline earth metals ?	2+2
Q.6.(A)	What happens when bleaching powder reacts with (i) HCl (ii) NH_3 (iii) H_2SO_4 (Excess) (iv) CO_2	1+1+1+1
(B)	Describe screening and bleaching steps in Neutral sulphite semi chemical process.	1+3
Q.7.(A)	Define sp^3 hybridization. Discuss it with a suitable example along with labeled diagram.	1+1+2
(B)	Define nucleophilic substitution reaction. Explain SN_2 mechanism in detail.	1+3
Q.8.(A)	Discuss oxidation reactions of alkynes. (any two)	4
(B)	Describe disproportionation reaction in benzaldehyde , when it is treated with aqueous solution of 50 % NaOH at room temperature.	4
Q.9.(A)	Give preparation of benzene with any four methods.	4
(B)	Give reactions for the preparation of phenyl acetate , benzene cyclohexanol and picric acid from phenol.	4

CHEMISTRY

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QUESTION NO. 1

- 1 Keeping in view the size of atoms, which order is the correct one?
(A) $Mg > Sr$ (B) $Ba > Mg$ (C) $Lu > Ce$ (D) $Cl > I$
- 2 Which one of the following does not belong to alkaline - earth metals?
(A) Be (B) Ra (C) Ba (D) Rn
- 3 Which element forms an ion with charge +3?
(A) Beryllium (B) Aluminium (C) Carbon (D) Silicon
- 4 Laughing gas is chemically.
(A) NO (B) N_2O (C) NO_2 (D) N_2O_4
- 5 Which of the following hydrogen halide is the weakest acid in solution?
(A) HF (B) HBr (C) HI (D) HCl
- 6 Total number of transition elements are
(A) 10 (B) 14 (C) 40 (D) 68
- 7 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
- 8 Synthetic rubber is made by polymerization of
(A) Chloroform (B) Acetylene (C) Divinylacetylene (D) Chloroprene
- 9 Aromatic hydrocarbons are the derivatives of
(A) Normal series of paraffins (B) Alkene (C) Benzene (D) Cyclohexane
- 10 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
- 11 Ethanol can be converted into ethanoic acid by
(A) Hydrogenation (B) Hydration (C) Oxidation (D) Fermentation
- 12 Which test is given by Formaldehyde with Tollen's reagent ?
(A) Silver Mirror Test (B) Sodium Bisulphite Test
(C) 2, 4 - DNPH Test (D) Bromine water Test
- 13 Primary, Secondary and tertiary alcohols can be identified by test.
(A) Bromine water Test (B) Lucas Test (C) Silver mirror Test (D) 2, 4 - DNPH Test
- 14 Amino acids reacts with ninhydrin to form intensely coloured product.
(A) Reddish green (B) Bluish violet (C) Yellowish (D) Pinkish
- 15 Nylon is polyamide made by hexamethylene diamine with.
(A) Adipic acid (B) Picric Acid (C) Oxalic Acid (D) Acetic Acid
- 16 Urea is high quality
(A) Potassium fertilizers (B) Phosphatic fertilizers
(C) Nitrogenous fertilizers (D) Calcareous fertilizers
- 17 Ozone is a gas having oxygen atom.
(A) Three (B) Two (C) One (D) Four

CHEMISTRY
GROUP: FIRST

SUBJECTIVE

TIME: 2 HRS 40 MINUTES

MARKS: 68

SECTION-I

QUESTION NO. 2 Write short answers any Eight (8) of the following

16

i	What is effect of strong heating on orthoboric acid ?
ii	Justify that Aluminum is amphoteric. Give an examples.
iii	What are semiconductors and give effect of temperature on semiconductors ?
iv	Why the straight chain structures of benzene have been ruled out ? Give two reasons.
v	Write mechanism for the halogenation of benzene in the presence of catalyst.
vi	How does sulphonation of benzene take place ? Give its reaction.
vii	Write cyclic structures of glucose and fructose.
viii	Explain denaturation of proteins.
ix	What are steroids? Write structure of steroid nucleus.
x	What is the effect of CO on human health ?
xi	What is meant by hydrosphere ?
xii	What is meant by recycling of waste ?

QUESTION NO. 3 Write short answers any Eight (8) of the following

16

i	Draw the structure of ethene according to sp^2 -hybridization.
ii	Define heterocyclic compounds. Give one example.
iii	Convert 1- propanol to $CH_3 - CH_2 - CH_2 - Cl$
iv	How is ethane formed by the reaction of Grignard reagent?
v	Write down any two uses of ethene.
vi	What is laughing gas ?
vii	Draw the structure of white phosphorus and red phosphorus.
viii	P_2O_5 is a powerful dehydrating agent. Prove it giving two examples.
ix	How will you convert $CH_3 - CH_2 - Br \longrightarrow (CH_3 - CH_2)_4 N^+ Br^-$
x	Prepare 1-propanol by using methanal.
xi	Write down any four qualities of a good fertilizer.
xii	Mention non woody raw materials for the manufacturing of paper (any four)

QUESTION NO. 4 Write short answers any Six (6) of the following

12

i	What are paramagnetic and diamagnetic substances ?
ii	Write two uses of $KMnO_4$
iii	Define coordination number and coordination sphere.
iv	Give the reactions of Ethanol with (i) $SOCl_2$ (ii) PCl_5
v	Why is phenol acidic in nature ?
vi	Give the iodoform test to distinguish between methanol and ethanol.
vii	Convert acetaldehyde into lactic acid.
viii	Describe Benedict's solution test.
ix	Convert ethanol into ethanoic acid.

SECTION-II

Note: Attempt any Three questions from this section

8 x 3 = 24

Q.5-(A)	How do you justify the position of hydrogen at the top of I-A and VII-A groups ?
(B)	Mention the properties of beryllium in which it differs from its own family members.
Q.6-(A)	Write a brief note on: (i) Disproportionation reactions of Chlorine. (ii) I_2O_5 preparation and one reaction
(B)	Define paper. Explain the digestion process in detail.
Q.7-(A)	What is isomerism ? Discuss any three types of structured isomerism.
(B)	Discuss the atomic orbital treatment to explain the structure of benzene.
Q.8-(A)	Write reaction of $HC \equiv CH$ with (i) H_2O in the presence of $H_2SO_4 / HgSO_4$ (ii) Strong alkaline $KMnO_4$
(B)	Discuss in detail the mechanism of nucleophilic substitution unimolecular (S_N1)
Q.9-(A)	Explain Cannizzaro's reaction with mechanism. Which aldehydes give this reaction ?
(B)	How are carbonylic acids prepared from esters and alkenes ?

CHEMISTRY

GROUP : SECOND

OBJECTIVE

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QUESTION NO. 1

1	Which of the following acid can be use as a catalyst in Friedal - Crafts reaction ? (A) $AlCl_3$ (B) HNO_3 (C) $BeCl_2$ (D) $NaCl$
2	When CO_2 is made to react with ethyl magnesium iodide, followed by acid hydrolysis, the product is (A) Propane (B) Propanoic acid (C) Propanal (D) Propanol
3	Ethanol can be converted into ethanoic acid by (A) Hydrogenation (B) Hydration (C) Oxidation (D) Fermentation
4	Rectified spirit contains alcohol about (A) 80 % (B) 85 % (C) 90 % (D) 95 %
5	Silver mirror test is given by . (A) Ethers (B) Ketones (C) Aldehydes (D) Alcohols
6	Amino acids are prepared by (A) Kolbe 's method (B) Strecker Synthesis (C) Fittig Reaction (D) William's son synthesis
7	The percentage of nitrogen in urea is (A) 16 % (B) 46 % (C) 56 % (D) 80 %
8	Which one of the following base is not present in DNA? (A) Adenine (B) Uracil (C) Thymine (D) Cytosine
9	The proportion of N_2 in atmosphere is (A) 78 % (B) 21 % (C) 0.9 % (D) 0.03 %
10	Keeping in view the size of atoms, which order is the correct one? (A) $Mg > Sr$ (B) $Ba > Mg$ (C) $Lu > Ce$ (D) $Cl > I$
11	The oxides of Beryllium are (A) Acidic (B) Basic (C) Amphoteric (D) None of these
12	Which metal is used in thermite process due to its acitivity? (A) Iron (B) Copper (C) Aluminium (D) Zinc
13	Among group V-A elements the most electronegative element is (A) Sb (B) N (C) P (D) As
14	Which of the following Hydrogen halide is the weakest acid in solution? (A) HF (B) HBr (C) HCl (D) HI
15	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
16	The state of hybrindization of carbon atom in methane is (A) sp^3 (B) sp^2 (C) sp (D) dsp^2
17	The formula of chloroform is (A) CH_3Cl (B) CCl_4 (C) CH_2Cl_2 (D) $CHCl_3$

SECTION-I

QUESTION NO. 2 Write short answers any Eight (8) of the following

16

i	What are silicates ? Give two examples.
ii	How does H_3BO_3 react with ethyl alcohol ?
iii	Explain why CO_2 is non – polar and acidic in character ?
iv	How is TNT prepared from toluene ?
v	Write structural formula of the following compounds. (a) Naphthalene (b) Acetophenone
vi	Why –OH group is ortho - para directing ?
vii	What is the difference between a glycosidic linkage and a peptide linkage ?
viii	How “ pH change ” and “ radiation ” affect the enzyme activity ?
ix	How is soap prepared from triglyceride ? Give reaction.
x	Which chloride of nitrogen is powerful eye irritant and how is it formed from ammonia ?
xi	How are detergents threats to aquatic animal life ?
xii	Why is chlorine used for the disinfection of water ?

QUESTION NO. 3 Write short answers any Eight (8) of the following

16

i	What is Crude Oil ? Give its importance.
ii	Give names and formulas of any four functional groups
iii	What is Sabatier-Sendern's reaction ?
iv	Discuss the reactivity of $Pi (\pi)$ bond.
v	Give any two commercial uses of ethyne.
vi	What is meant by fuming nitric acid ?
vii	Give precipitation reactions of H_2SO_4 .
viii	How is HNO_2 prepared ? Give one reaction.
ix	Discuss the reactivity of alkyl halides.
x	Define nucleophile , give two examples.
xi	Name essential steps in paper manufacturing process.
xii	Give the importance of nitrogen fertilizers.

QUESTION NO. 4 Write short answers any Six (6) of the following

12

i	Give the systematic names of following complexes. (a) $K_4[Fe(CN)_6]$ (b) $[PtCl(NO_2)(NH_3)_4]SO_4$
ii	How does the electronic configuration of valence shell affect paramagnetic properties of transition elements ?
iii	Give two methods of preparations of $K_2Cr_2O_7$
iv	How will you distinguish between 1 – propanol and 2 – propanol ?
v	How will you convert formaldehyde into ethyl alcohol ?
vi	How does phenol react with (a) Zn dust (b) Bromine water
vii	Write 2, 4 – DNPH – Test of carbonyl compounds.
viii	Give the mechanism of phenyl hydrazine with acetone.
ix	What is vinegar ?

SECTION-II

Note: Attempt any Three questions from this section

8 x 3 = 24

Q.5-(A)	How do you justify the position of hydrogen at the top of group IA and VII A elements ?
(B)	Describe the peculiar behavior of beryllium.
Q.6-(A)	What are halogens ? Give three application of Bromine and Iodine each.
(B)	What is Paper ? Describe the process of digestion in paper industry.
Q.7-(A)	Define structural isomerism. Discuss its three types.
(B)	Define sulphonation of benzene. Discuss its mechanism.
Q.8-(A)	Starting from ethyne prepare: (1) Acetaldehyde (2) Benzene (3) Chloroprene (4) Glyoxal
(B)	Define nucleophil substitution reaction. Describe in detail S_N1 reactions.
Q.9-(A)	Explain with mechanism Aldol Condensation.
(B)	How Acetic acid is prepared from (i) Grignard reagent (ii) Hydrolysis of esters (iii) Alkene (iv) Alcohol

SECTION-I

QUESTION NO. 2 Write short answers any Eight (8) of the following

16

- i Differentiate between Hydrides and Halides
- ii Why oxidation state of noble gases is usually zero ?
- iii Write formula of Calcite and Barite
- iv What is effect of heat on LiOH and $Mg(OH)_2$, give equations
- v Write four common properties of group IVA elements
- vi Write formulas of following minerals of silicon (i) Zircon (ii) Talc
- vii Conc. H_2SO_4 is oxidizing agent, prove the statement by two reactions
- viii What is effect of heat on H_3PO_4 ?
- ix Define coordination number and coordination sphere
- x How does cathode coating prevent iron from corrosion ?
- xi Write chemical reactions involved in preparation of urea from CO_2 and NH_3
- xii Write names and formula of two phosphatic fertilizer

QUESTION NO. 3 Write short answers any Eight (8) of the following

16

- i Write down the factors on which the oxidizing power of halogens depends on
- ii What are Freons and Teflon ?
- iii Define hetero cyclic compounds. Give two examples
- iv Why there is no free rotation around a double bond ?
- v How the Ethylene Glycol is prepared from ethane. Give the reaction
- vi Write down four uses of Ethyne
- vii What is Mustard gas ? How is it prepared ?
- viii Define Nucleophile. Give two examples
- ix Give the reaction of Ethyl magnesium Bromide with ethylene epoxide
- x What are thermoplastic polymer ? Give two examples
- xi Enlist four properties of enzymes
- xii Discuss the rancidity of fats and oils

QUESTION NO. 4 Write short answers any Six (6) of the following

12

- i Give names and possible isomeric structure of xylene
- ii Convert the Benzene into m-chloronitrobenzene
- iii Why absolute alcohol cannot be prepared by fermentation ? Discuss
- iv Complete the reaction : $Phenol + Br_2 \longrightarrow$
- v How will you distinguish between methanal and ethanal ? Give reaction
- vi How does alanine react with alcohol ?
- vii Convert CH_3COOH into Glycine
- viii What is ozone hole ? Give its significance
- ix Mention some harmful effects of acid rain

SECTION-II

Note: Attempt any Three questions from this section

8 x 3 = 24

- | | |
|---------|---|
| Q.5-(A) | Discuss the position of hydrogen on top of Group VIIA (Four similarities and Four differences) |
| (B) | Write note on peculiar behaviour of Boron |
| Q.6-(A) | Write down any eight properties of lithium in which it behave differently from its own group members |
| (B) | Write down the systematic names of following complexes
(i) $[Fe(CO)_5]$ (ii) $[Co(NH_3)_6]Cl_3$ (iii) $Na_3[CoF_6]$ (iv) $K_2[PtCl_6]$ |
| Q.7-(A) | Explain Reforming of petroleum with example |
| (B) | Define Nucleophilic substitution reaction. Also explain S_N1 mechanism with example |
| Q.8-(A) | Write a comprehensive note on the polymerization of alkynes |
| (B) | Define and explain aldol condensation along with mechanism |
| 9.(A) | Describe the structure of benzene on the basis of atomic orbital treatment |
| (B) | How would you convert ? : (i) Phenol to Bakelite (ii) Methanol to Ethanol |

NOTE: You have four choices for each objective type question as A, B, C and D. The choice which you think is correct, fill that circle in front of that question number. Use marker or pen to fill the circles. Cutting or filling two or more circles will result in zero mark in that question.

QUESTION NO. 1

1	Which statement is incorrect ?	(A) All metals are good conductor of electricity	(B) All metals are good conductor of heat
		(C) All metals form positive ions	(D) All metals form acidic oxides
2	Which one of following is not an alkali metal ?	(A) Francium	(B) Caesium
		(C) Rubidium	(D) Radium
3	The chief ore of aluminium is.	(A) Na_3AlF_6	(B) $\text{Al}_2\text{O}_3 \cdot 2\text{H}_2\text{O}$
		(C) Al_2O_3	(D) $\text{Al}_2\text{O}_3 \cdot \text{H}_2\text{O}$
4	Laughing gas is chemically.	(A) NO	(B) N_2O
		(C) NO_2	(D) N_2O_4
5	The anhydride of HClO_4 is	(A) ClO_3	(B) ClO_2
		(C) Cl_2O_5	(D) Cl_2O_7
6	Which of following is a non-typical transition element ?	(A) Cr	(B) Mn
		(C) Zn	(D) Fe
7	Linear shape is associated with which set of hybrid orbitals	(A) sp	(B) sp^2
		(C) sp^3	(D) dsp^2
8	β - β' - dichloroethyl sulphide is commonly known as.	(A) Mustard gas	(B) Laughing gas
		(C) Phosgene gas	(D) Bio-gas
9	Which compound is most reactive one ?	(A) Benzene	(B) Ethene
		(C) Ethane	(D) Acetylene
10	Which of the following is not a nucleophile ?	(A) H_2O	(B) H_2S
		(C) SO_3	(D) NH_3
11	Cannizzaro's reaction is not given by.	(A) Formaldehyde	(B) Acetaldehyde
		(C) Benzaldehyde	(D) Trimethylacetaldehyde
12	Which enzyme is not involved in fermentation of starch ?	(A) Diastase	(B) Zymose
		(C) Urease	(D) Invertase
13	The solution of which acid is used for seasoning of food.	(A) Formic acid	(B) Acetic acid
		(C) Benzoic acid	(D) Butanoic acid
14	Which one of following element is not present in all proteins ?	(A) Carbon	(B) Hydrogen
		(C) Nitrogen	(D) Sulphur
15	Phosphorus helps the growth of.	(A) Root	(B) Stem
		(C) Leave	(D) Seed
16	Which of following is secondary pollutant ?	(A) CO	(B) NH_3
		(C) SO_3	(D) PAN
17	A single chloride free radical can destroy upto.	(A) 10000 O_3 molecules	(B) 1000 O_3 molecules
		(C) 100000 O_3 molecules	(D) 1000000 O_3 molecules

QUESTION NO. 2 Write short answers any Eight (8) parts of the following

16

i	Why the metallic character increases from top to bottom in group of metals ?
ii	Diamond is a non-conductor but graphite is a fairly good conductor. Give the reason.
iii	Write down the formula of (i) Carnallite (ii) Gypsum
iv	Why the aqueous solution Na_2CO_3 is basic in nature ?
v	Write down the uses of Boric Acid.
vi	What is the effect of temperature on semi conductors ?
vii	Write two reactions in which H_2SO_4 acts as dehydrating agent.
viii	Write down four uses of Nitric acid.
ix	Write down the electronic configuration of (i) $_{24}\text{Cr}$ (ii) $_{29}\text{Cu}$
x	Define corrosion. How it can be prevented ? Name any two methods.
xi	What are fertilizers ? Why are they needed ?
xii	What reactions take place in the setting of cement in first 24 hours ?

QUESTION NO. 3 Write short answers any Eight (8) parts of the following

16

i	Give any four uses of bleaching powder.
ii	What is disproportionation reaction ? Give reaction of NaOH with Cl_2 .
iii	Define functional group. Give names and formula of any two oxygen containing functional groups.
iv	From where does the energy come to excite Carbon atom in hybridization ? Briefly explain.
v	Give nitration reaction of methane. Also give its importance.
vi	Convert 1, 2- dibromoethane into ethene. Also give conditions.
vii	Convert 2-Butyne into trans-2-Butene.
viii	Complete the following reaction. $\text{C}_2\text{H}_5\text{MgBr} + \text{Epoxide} \xrightarrow[\text{H}_3\text{O}^+]{\text{Ether}}$
ix	Define the following with one example. (i) Electrophile (ii) Nucleophile
x	Define Iodine number. Give its importance.
xi	Draw the structural formula of an oil (Glyceryl trioleate).
xii	Give the importance of Proteins (any four).

QUESTION NO. 4 Write short answers any Six (6) parts of the following

12

i	What are objections to Kekule's formula of benzene ?
ii	Define resonance also give one example.
iii	What is fermentation ? Write essential conditions of fermentation.
iv	Discuss preparation of ethers.
v	How are ketones oxidized ? Give example.
vi	How acetic acid reacts with (a) PCl_5 (b) SOCl_2
vii	Discuss strecker synthesis.
viii	Define primary and secondary pollutants.
ix	Explain the terms briefly. (a) BOD (b) COD

SECTION-II

Note: Attempt any Three questions from this section

8 x 3 = 24

Q.5- (A)	Discuss the position of hydrogen with carbon family giving any two Similarities and Dissimilarities.
(B)	Give reactions of Aluminium with (i) NaOH (ii) H_2SO_4 (iii) O_2 (iv) HCl
Q.6- (A)	Discuss the peculiar behaviour of Lithium with respect to the other member of alkali metals. Any four points.
(B)	Explain electrochemical theory of corrosion in detail.
Q.7- (A)	What is orbital hybridization, explain sp -type of hybridization with example.
(B)	Write a descriptive note on $\text{S}_\text{N}2$ reaction.
Q.8- (A)	Discuss Kolbe's electrolytic method for preparation of ethene.
(B)	How does acetaldehyde react with (i) Sodium bisulphite (ii) Hydrazine (iii) Ethyl alcohol (iv) Sodium Borohydride
Q.9- (A)	Describe nitration of benzene with mechanism.
(B)	How does phenol react with following reagents. (i) NaOH (ii) Zn (iii) HNO_3 (iv) Bromine water.

OBJECTIVE



NOTE: You have four choices for each objective type question as A , B , C and D . The choice which you think is correct , fill that circle in front of that question number. Use marker or pen to fill the circles. Cutting or filling two or more circles will result in zero mark in that question.

QUESTION NO. 1

- 1 Mark the correct statement
(A) The ionization energy of calcium is lower than that of barium
(B) The ionization energy of calcium is lower than that of magnesium
(C) The ionization energy of calcium is higher than that of berylliums
(D) The ionization energy of calcium is lower than that of strontium
- 2 Which of the following sulphates is not soluble in water ?
(A) Sodium sulphate (B) Potassium sulphate (C) Barium sulphate (D) Zinc sulphate
- 3 Boric acid cannot be used
(A) As antiseptic in medicine (B) For washing eyes (C) In soda bottles (D) For enamels and glazes
- 4 Which catalyst is used in contact process ?
(A) Fe_2O_3 (B) V_2O_5 (C) SO_3 (D) Ag_2O
- 5 The anhydride of HClO_4 is
(A) ClO_3 (B) ClO_2 (C) Cl_2O_7 (D) Cl_2O_5
- 6 Which of the following represents the correct electronic configuration of the outer most energy level of an element of (VIIA) in the ground state ?
(A) S^2P^2 (B) S^2P^4 (C) S^2P^5 (D) S^2P^6
- 7 Group VIB of the transition elements contains
(A) Zn , Cd , Hg (B) Fe , Ru , Os (C) Cr , Mo , W (D) Mn , Te , Re
- 8 Ethers show the phenomenon of
(A) Position isomerism (B) Functional group isomerism (C) Metamerism (D) Cis-Trans isomerism
- 9 The addition of unsymmetrical reagent to an unsymmetric alkene follows the rule
(A) Hund's Rule (B) Pauli's Exclusion principle (C) Markownikoff's Rule (D) Aufbau Principle
- 10 The electrophile in aromatic sulphonation is
(A) H_2SO_4 (B) HSO_4 (C) SO_3^+ (D) SO_3
- 11 Which one of the following is not a nucleophile ?
(A) H_2O (B) H_2S (C) NH_3 (D) BF_3
- 12 Which compound shows hydrogen bonding?
(A) C_2H_6 (B) $\text{C}_2\text{H}_5\text{Cl}$ (C) $\text{CH}_3\text{-O-CH}_3$ (D) $\text{CH}_3\text{CH}_2\text{-OH}$
- 13 Formalin is
(A) 60 % solution of formaldehyde in water (B) 10 % solution of formaldehyde in water
(C) 20 % solution of formaldehyde in water (D) 40 % solution of formaldehyde in water
- 14 The carbon atom of a carbonyl group is
(A) SP -hybridized (B) SP^2 -hybridized (C) SP^3 -hybridized (D) dsp -hybridized
- 15 Acetic acid is manufactured by
(A) Distillation (B) Fermentation (C) Ozonolysis (D) Esterification
- 16 Which acid is used in the manufacture of synthetic fibre ?
(A) Formic acid (B) Oxalic acid (C) Carbonic acid (D) Acetic acid
- 17 Micro Nutrients are required in a quantity ranging from
(A) 6 - 200 kg (B) 6 - 200 g (C) 4 - 40 kg (D) 60 - 400 kg

SECTION-I

QUESTION NO. 2 Write short answers any Eight (8) of the following

16

1.	Why Na^+ is smaller than Na atom ?
2.	What do you know about S-block Elements ? Give two examples
3.	Give two properties of Alkaline Earth metals
4.	Give chemical formulas of Sylvite and Spodumene
5.	What happens when Borax is dissolved in water ?
6.	Give two uses of Boric Acid
7.	Give two points regarding peculiar behaviour of carbon
8.	Give two methods of preparation of NO_2
9.	Give two dissimilarities between oxygen and sulphur
10.	What are nitrogeous fertilizers ? Give two examples
11.	Why potassium fertilizers are important for plants ? Give one example of a potassium fertilizer
12.	Define cement. Why is it called Portland cement ?

QUESTION NO. 3 Write short answers any Eight (8) of the following

16

1.	How does oxidation state of halogen affect the acidic strength of oxyacids of halogen ?
2.	Write factors affecting the oxidizing power of halogens
3.	Write reactions of chlorine with cold and hot NaOH
4.	Define substitutional alloys and give one example
5.	Why transition elements show colour
6.	Write objections to Kekule's formula of benzene
7.	Compare the reactivity of benzene and alkene
8.	How will you distinguish between methanal and ethanal ?
9.	Write chemistry of Fehling's solution test
10.	Write reactions of acetic acid with (a) PCl_5 (b) SOCl_2
11.	Give mechanism of esterification
12.	Write manufacture of acetic acid from acetylene

QUESTION NO. 4 Write short answers any Six (6) of the following

12

1.	What is octane number of Gasoline ?
2.	What is catalytic cracking ?
3.	What is Sabatier-Senden's reaction ? Give its industrial importance
4.	What is Clemmensen and Wolf-Kishner's reduction reaction
5.	What is Wurtz synthesis ? Give its reaction
6.	Draw structure of primary, secondary and tertiary alkyl halide from the given compound $\text{C}_6\text{H}_{13}\text{Cl}$
7.	Give the formation of ortho and para hydroxy benzene sulphonic acid from phenol
8.	Why phenol is more acidic than that of alcohol
9.	How will you convert methane into ethane ?

SECTION-II

Note: Attempt any Three questions from this section

8 x 3 = 24

Q.5-(A)	Write similarities and differences of Halogens with Hydrogen
(B)	Explain construction and working of Diaphragm cell
Q.6-(A)	Briefly explain the following general characteristics properties of transition elements (i) Paramagnetism (ii) Binding Energies
(B)	What are dehydrogenating agents ? Give any four reactions in which sulphuric acid play the role of dehydrating agent
Q.7-(A)	Write a note on the cracking of Hydrocarbons
(B)	What types of Aldehydes give Cannizzaro's reaction ? Give its mechanism
Q.8-(A)	Give the preparation reactions of alkanes from (i) Carbonyl compounds (ii) Alkyl Halides
(B)	Explain the following terms by giving suitable examples (i) Nucleophile (ii) Electrophile (iii) Leaving group (iv) Substrate
Q.9-(A)	Write the nitration reaction of benzene with mechanism
(B)	How phenol is prepared from (i) Chlorobenzene (ii) Sodium salt of Benzene Sulphonic Acid



NOTE: You have four choices for each objective type question as A , B , C and D . The choice which you think is correct , fill that circle in front of that question number. Use marker or pen to fill the circles. Cutting or filling two or more circles will result in zero mark in that question.

QUESTION NO. 1

- 1 Which compound will have maximum repulsion with H_2O ?
(A) C_6H_6 (B) C_2H_5OH (C) $CH_3-CH_2-CH_2-CH_2-OH$ (D) CH_3-O-CH_3
- 2 Micronutrients are required in quantity ranging from
(A) 4 - 40 g (B) 6 -200 g (C) 6 - 200 kg (D) 4 - 40 kg
- 3 Which is the strongest acid ?
(A) $HClO$ (B) $HClO_2$ (C) $HClO_3$ (D) $HClO_4$
- 4 Which halogen occurs naturally in positive oxidation state ?
(A) Fluorine (B) Chlorine (C) Bromine (D) Iodine
- 5 Acetone reacts with HCN to form cyanohydrins , it is an example of
(A) Electrophilic addition (B) Electrophilic substitution (C) Nucleophilic addition
(D) Nucleophilic substitution
- 6 Which of the following compound will not give iodoform test on treatment with $I_2/NaOH$?
(A) Acetaldehyde (B) Acetone (C) Butanone (D) 3-Pentanone
- 7 Which of the following derivatives cannot be prepared directly from Acetic Acid ?
(A) Acetamide (B) Acetyl chloride (C) Acetic anhydride (D) Ethyl acetate
- 8 Which one of the following is not a fatty acid ?
(A) Propanoic acid (B) Acetic acid (C) Phthalic acid (D) Butanoic acid
- 9 Mark the correct statement
(A) All lanthanides are present in same group (B) All halogens are present in same period
(C) All the alkali metals are present in same group (D) All noble gases are present in same period
- 10 Which ion will have maximum value of heat of hydration
(A) Na^+ (B) Cs^{2+} (C) Ba^{2+} (D) Mg^{2+}
- 11 Which element belongs to group IVA of periodic table
(A) Barium (B) Iodine (C) Lead (D) Oxygen
- 12 Oxidation of "NO" in air produces
(A) N_2O (B) N_2O_3 (C) N_2O_4 (D) N_2O_5
- 13 The total number of transition elements is
(A) 10 (B) 14 (C) 40 (D) 58
- 14 The chemist who synthesized urea from ammonium cyanate was
(A) Berzelius (B) Kolbe (C) Wholer (D) Lavoisier
- 15 The presence of double bond in compound is sign of
(A) Saturation (B) Un-saturation (C) Sublimation (D) Crystallization
- 16 Aromatic hydrocarbons are the derivative of
(A) Paraffins (B) Alkene (C) Benzene (D) Cyclohexane
- 17 Which one of the following is not nucleophile
(A) H_2O (B) H_2S (C) BF_3 (D) NH_3

SECTION-I

QUESTION NO. 2 Write short answers any Eight (8) of the following

16

1	Define Ionization energy. How does it vary in periodic table
2	Define hydration energy. Give one example
3	Complete the following reactions (i) $\text{Be} + \text{NaOH} \rightarrow$ (ii) $\text{LiNO}_3 \rightarrow$
4	Write two advantages of Down's cell process
5	Write four uses of Borax
6	Aqueous solution of Borax is alkaline in nature why ?
7	Write balanced equations for the reactions of H_3BO_3 with (a) $\text{C}_2\text{H}_5 - \text{OH}$ (b) NaOH
8	Write two reactions which show oxidizing behavior of N_2O
9	Write two reactions which show reducing behavior of HNO_2
10	What are macronutrients ? Write their range per acre
11	Write four qualities of a good fertilizer
12	Name two calcareous and two argillaceous raw materials for cement

QUESTION NO. 3 Write short answers any Eight (8) of the following

16

1	What are disproportion reactions ? Give one example
2	Why HF is a weaker acid than HCl ?
3	Give four uses of Bleaching powder
4	What is variable oxidation state ? Why the transition elements show variable valency or oxidation state ?
5	Define corrosion. How corrosion is promoted when metal is dipped in water
6	What happens when a mixture of benzene vapours and air is passed over heated vanadium pentoxide ?
7	Define the terms with an example (a) Oxidation of Benzene (b) Sulphonation of Benzene
8	Give the mechanism of addition of sodium bisulphite to acetone
9	Give the mechanism of addition of HCN to acetone
10	Write down the names of the following compounds by IUPAC system <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> $\begin{array}{c} \text{COOH} \\ \\ \text{CH}_2 \\ \\ \text{COOH} \end{array}$ </div> <div style="text-align: center;"> $\begin{array}{c} \text{COOH} \\ \\ \text{C}_6\text{H}_4 \\ \\ \text{COOH} \end{array}$ </div> </div>
11	How will you convert ? (i) Acetic acid into Acetamide (ii) Acetic acid into Acetone
12	What happens when we heat ? (i) Calcium acetate (ii) Sodium formate with Soda lime

QUESTION NO. 4 Write short answers any Six (6) of the following

12

1	Define organic chemistry. What is vital force theory ?
2	What is steam cracking ? Give its application
3	What do you know about Clemmensen reduction and Wolf-Kishner's reduction ?
4	Give four uses of methane
5	How would you convert Ethyne into Oxalic Acid ?
6	Define nucleophilic substitution reactions. Name its two types
7	Give two properties of $\text{S}_{\text{N}}1$ reactions
8	Why phenol is acidic in nature ?
9	How would you prepare Bakelite from phenol ?

SECTION-II

Note: Attempt any Three questions from this section

8 x 3 = 24

Q.5-(A)	Discuss the commercial preparation of caustic soda by diaphragm cell (Diagram is not require)
(B)	Discuss periodic trend in properties of elements (i) Melting point in groups and periods (ii) Boiling point in groups and periods
Q.6-(A)	Write down two reactions of sulphuric acid in which it behaves as oxidizing agent and two reactions in which it behaves as dehydrating agent
(B)	Explain the cathode coating and anode coating of iron
Q.7-(A)	What is structural isomerism ? Explain it's different types (any three)
(B)	How does acetone react with HCN and give it's reaction mechanism ?
Q.8-(A)	Write a detailed note on Halogenation of Methane
(B)	Write note on the following (i) Classification of Alkyl halides (ii) Wurtz Synthesis
Q.9-(A)	Explain structure of Benzene on the basis of Atomic orbital treatment
(B)	Write two methods for the preparation of phenol



OBJECTIVE

NOTE: You have four choices for each objective type question as A , B , C and D . The choice which you think is correct , fill that circle in front of that question number. Use marker or pen to fill the circles. Cutting or filling two or more circles will result in zero mark in that question.

QUESTION NO. 1

- 1 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
- 2 In the Down's cell, CaCl_2 is added to NaCl
(A) Increase the solubility (B) Increase the dissociation
(C) Increase the conductivity (D) To lower its melting point
- 3 The solution of the acid used for seasoning of food is
(A) Formic acid (B) Benzoic acid (C) Acetic acid (D) Butanoic acid
- 4 The benzene molecule contains
(A) Three double bonds (B) Two double bonds
(C) One double bond (D) Delocalized π electron charge
- 5 For which mechanism, the first step involved is the same
(A) E_1 and E_2 (B) E_2 and SN_2 (C) SN_1 and E_2 (D) E_1 and SN_1
- 6 Hydrogen bond is the strongest between the molecules of:
(A) HF (B) HCl (C) HBr (D) HI
- 7 A single chloride free radical destroys how many ozone molecules
(A) 100 (B) 100,000 (C) 1000 (D) 10
- 8 Laughing gas is chemically
(A) NO (B) N_2O (C) NO_2 (D) N_2O_4
- 9 Linear shape is associated with which type of hybridization?
(A) sp (B) sp^2 (C) sp^3 (D) dsp^2
- 10 Cannizzaro's reaction is not given by
(A) Formaldehyde (B) Acetaldehyde (C) Benzaldehyde (D) Tri-methyl acetaldehyde
- 11 Synthetic rubber is made by the polymerization of
(A) Chloroprene (B) Chloroform (C) Acetylene (D) Di-vinyl Acetylene
- 12 Tincal is a mineral of
(A) Al (B) B (C) Si (D) C
- 13 Which one of these polymers is an example of addition polymer?
(A) Nylon 6,6 (B) Polystyrene (C) Terylene (D) Epoxy resin
- 14 Which one is non-typical transition element?
(A) Cr (B) Mn (C) Zn (D) Fe
- 15 Methyl alcohol is not used as
(A) as a solvent (B) as an anti-freezing agent (C) as a substitute for petrol
(D) for denaturing of ethyl alcohol
- 16 How many zones through which the charge passes in a rotary kiln?
(A) 4 (B) 3 (C) 2 (D) 5
- 17 The pH of unpolluted rain water should be
(A) 5.6 (B) 7.0 (C) 4.8 (D) 3.2

SECTION-I

QUESTION NO. 2 Write short answers any Eight (8) questions of the following

16

1	Why the basicity of IIA group metal oxides increases on descending a group of Periodic Table ?
2	Why diamond is non-conductor and graphite is fairly a good conductor of electricity?
3	Give the reactions of Mg metal with (a) N_2 (b) H_2O at $100^\circ C$
4	Why are liquid silicones preferred over ordinary organic lubricants ?
5	Why is CO_2 a gas at room temperature while SiO_2 solid.
6	Why semiconductors conduct electricity better than insulator?
7	Why is SO_3 dissolved in H_2SO_4 and not in water (H_2O) in contact process?
8	NO_2 is a strong oxidizing agent .Prove the truth of this statement giving two examples.
9	How do you justify that N_2O is supporter of combustion , give two examples.
10	What is meant by ecosystem?
11	What are primary pollutants? Give at least two examples.
12	Define the term octane number. How octane number of gasoline is improved?

QUESTION NO. 3 Write short answers any Eight (8) questions of the following

16

1	Define paramagnetism? Which two transition metal ions have strongest paramagnetic behavior?
2	Define the term ligand with two examples?
3	How is cis-2-Butene prepared from an alkyne? Give its chemical reaction.
4	State Markonikov's rule with an example?
5	How will you distinguished chemically between toluene and benzene.
6	How is a Grignard's Reagent converted into 1-propanol and 2- propanol?
7	How does ethyl alcohol react with H_2SO_4 in two different ways?
8	How is phenol prepared by Dow 's method?
9	How is lactic acid prepared from an aldehyde?
10	Write a reaction which is used to protect aldehyde group against alkaline oxidizing agent?
11	Write the structural formulae of these compounds (a) Phthalic acid (b) tartaric acid
12	How is acetamide prepared from acetic acid? Give its reaction mechanism.

QUESTION NO. 4 Write short answers any Six (6) questions of the following

12

1	What is the chemical nature of enzymes?
2	What is meant by rancidity of fats or oils?
3	Write structural formula of cholesterol.
4	What are clinkers?
5	Write down four qualities of a good fertilizer.
6	What are the prospects of paper industry in Pakistan?
7	What is "Iodized salt"?
8	Write two uses of helium.
9	Why is HF weaker acid than HCl ?

SECTION-II

Note: Attempt any Three questions from this section

8 x 3 = 24

5-(A)	Define ionization energy. Give an example. How does it vary in groups and periods in Periodic Table ?
(B)	Describe the commercial preparation of sodium hydroxide by Diaphragm cell with diagram
6-(A)	Prepare $KMnO_4$ by Stadelers process and Electrolytic oxidation process.
(B)	What are carbohydrates and how are they classified?
7-(A)	Explain Stability of Benzene.
(B)	Explain classification of organic compounds on the base of carbon skeleton.
8-(A)	Write down structural formulae for the products formed when 1-butene reacts with (i) Cold dil. $KMnO_4 / OH^-$ (ii) HBr (iii) O_2 in the presence of Ag_2O (iv) $HOCl$
(B)	How are monohydric alcohols classified? Write preparation of ethyl alcohol from molasses.
9-(A)	Give the reactions of ethyl magnesium bromide with the followings (i) CO_2 (ii) $CICN$ (iii) $HCHO$ (iv) $(CH_3)_2CO$
(B)	Give four uses for each of formaldehyde and acetaldehyde.

CHEMISTRY, GROUP SECOND

(NEW COURSE)

ACADEMIC SESSION: 2015-17 TO 2016-18

TIME: 20 MINUTES

MARKS: 17

OBJECTIVE



NOTE: You have four choices for each objective type question as A, B, C and D. The choice which you think is correct, fill that circle in front of that question number. Use marker or pen to fill the circles. Cutting or filling two or more circles will result in zero mark in that question.

QUESTION NO. 1

- 1 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
- 2 Which one of the following does not belong to alkaline earth metals ?
(A) Be (B) Ra (C) Ba (D) Rn
- 3 Tincal is a mineral of
(A) Al (B) B (C) Si (D) C
- 4 Laughing gas is chemically
(A) NO (B) N_2O (C) NO_2 (D) N_2O_4
- 5 Chlorine heptaoxide (Cl_2O_7) react with H_2O to form
(A) Hypochlorous acid (B) Chloric acid (C) Perchloric acid (D) Chlorine and Oxygen
- 6 Which of the following is a typical transition metal
(A) Sc (B) Y (C) Ra (D) Co
- 7 Select from the following the one which is an alcohol
(A) $\text{CH}_3 - \text{CH}_2 - \text{OH}$ (B) $\text{CH}_3 - \text{O} - \text{CH}_3$ (C) CH_3COOH (D) $\text{C}_2\text{H}_5 - \text{Br}$
- 8 The formula of chloroform is
(A) CH_3Cl (B) CCl_4 (C) CH_2Cl_2 (D) CHCl_3
- 9 During nitration of benzene the active nitrating agent is
(A) NO_3 (B) NO_2^+ (C) NO_2 (D) HNO_3
- 10 In primary alkyl halides, the halogen atom is attached to a carbon which is further attached to carbon atoms. Indicate the number.
(A) Two (B) Three (C) One (D) Four
- 11 Which compound is called universal solvent ?
(A) H_2O (B) CH_3OH (C) $\text{C}_2\text{H}_5\text{OH}$ (D) $\text{CH}_3 - \text{O} - \text{CH}_3$
- 12 Ketones are prepared by the oxidation of
(A) Primary alcohol (B) Secondary alcohol (C) Tertiary alcohol (D) All of these
- 13 The solution of which acid is used for seasoning of food
(A) Formic acid (B) Acetic acid (C) Benzoic acid (D) Butanoic acid
- 14 The reaction between fat and NaOH is called
(A) Esterification (B) Hydrogenolysis (C) Fermentation (D) Saponification
- 15 Which is not a calcareous material?
(A) Lime (B) Clay (C) Marble (D) Marine shell
- 16 Peroxyacetyl nitrate (PAN) is an irritant to human beings and its effects
(A) Eyes (B) Ears (C) Stomach (D) Nose
- 17 To avoid the formation of toxic compounds with chlorine, which substance is used for disinfecting water ?
(A) KMnO_4 (B) O_3 (C) Alums (D) Chloramines

SECTION-I

QUESTION NO. 2 Write short answers any Eight (8) questions of the following

16

1	Write note on Lithosphere.
2	Define Primary and Secondary Pollutant.
3	Write composition of natural gas.
4	How NO acts as reducing agent? Give two examples
5	Justify that N_2O is a supporter of combustion, write two reactions.
6	Why SO_3 gas is dissolved in H_2SO_4 not in H_2O ?
7	Why Al is not found in free state?
8	Justify that CO_2 is acidic in nature.
9	How Borax is used as water softening agent?
10	What are advantages of KO_2 for mountaineers?
11	Justify that ZnO is an amphoteric oxide.
12	Why Anion is bigger in size than its parent atom?

QUESTION NO. 3 Write short answers any Eight (8) questions of the following

16

1	Why does damaged tin plated iron get rusted quickly?
2	Under what conditions does aluminium corrode?
3	Write industrial preparation of Ethyne.
4	How are alkynes prepared from vicinal dihalides?
5	How can you prepare m-Chloronitrobenzene from benzene?
6	Write down a method for the preparation of ethyl magnesium bromide in the laboratory.
7	How can you distinguish Ethanol and Methanol? Give a chemical test.
8	Write structural formulae of lactic acid and tartaric acid.
9	Write general mechanism of base-catalysed nucleophilic addition reaction of carbonyl compound.
10	Write equations for the reactions of hydroxylamine with ethanal and acetone.
11	What are fatty acids? Give any two examples.
12	Write equations for reactions of acetic acid with PCl_5 and $SOCl_2$

QUESTION NO. 4 Write short answers any Six (6) questions of the following

12

1	Give any four uses of Bleaching Powder.
2	Why HF is a weaker acid than HCl?
3	What are Freon and Teflon?
4	What are thermosetting polymer? Give two examples.
5	Give four points about the importance of lipids.
6	What are Epoxy Resins? Give an example.
7	What is lignin? Why it is necessary to remove it in pulp making?
8	Write any four essential qualities of a good fertilizer.
9	How digestive process is carried out in paper industry?

SECTION-II

Note: Attempt any Three questions from this section

8 x 3 = 24

5-(A)	Discuss four Blocks in Modern Periodic Table?
(B)	Describe the preparation of sodium metal by Down's Cell with diagram.
6-(A)	Define Corrosion. Explain electrochemical theory of Corrosion in detail.
(B)	Explain two methods of purification of water.
7-(A)	What is sp^2 - mode of Hybridization? Explain the formation of Ethene by sp^2 Hybridization concept.
(B)	Describe the structure of Benzene on the basis of atomic orbital treatment.
8-(A)	Discuss the following terms with respect to alkenes with suitable chemical reactions. (i) Ozonolysis (ii) Hydroxylation
(B)	Name the test which is used for the identification of primary, secondary and tertiary alcohols and explain it with suitable example.
9-(A)	How does Ethyl magnesium bromide react with (i) CO_2 (ii) CH_3CHO
(B)	Describe with mechanism aldol condensation reaction.