

BOARD OF INTERMEDIATE EDUCATION, KARACHI

H.S.C. Annual Examinations 2021

(MODEL QUESTION PAPER)

CHEMISTRY PAPER-II

Total Duration: 02 Hours

Total Marks: 85

SECTION "A" (M.C.Qs)

Marks: 43

Note: This section consists of 43 questions. Attempt all M.C.Qs. Each carries 1 marks.

Q1. Choose the correct answers for each from the given options:

- The element which is present in group V A and period 3rd, its atomic number is:
- * 15 * 7 * 8 * 18
- 2) Hydrides of group V A are ----- in nature:
- * Acidic * Basic * Amphoteric * Neutral
- 3) Potassium when combines with oxygen form:
- * Normal oxide * Super oxide * Per oxide * All
- 4) Lithium has many similarities to its diagonal neighbour-----in "Be" family:
- * K * Mg * Ca * Na
- 5) $\text{Li}^+_{(\text{aq})}/\text{Li}$ couple has exceptionally high negative electrode potential because of its large value of
- * Ionization potential * Hydration enthalpy
* Electron Affinity * Electronegativity
- 6) Aluminium does not react with Nitric acid due to
- * Low reactivity * High Ionization Potential
* Formation of oxide layer * It is a metal
- 7) "A" is the element of III A group which "B" belongs to V A group. When "A" reacts with "B" forms:
- * A_2B_3 * AB * AB_3 * A_3B_2

8) The mixture of "Al" and Fe_2O_3 is used in :

- * Pyrolysis * Thermite process * Electrolysis * Washing

9) This element is solid at room temperature and pressure:

- * Oxygen * Fluorine * Bromine * Iodine

10) Electronic configuration of Cu^{+1} :

- * $4s^1, 3d^{10}$ * $4s^0, 3d^9$ * $4s^0, 3d^{10}$ * $4s^2, 3d^{10}$

11) The coordination number of Pt in $[\text{Pt}(\text{en})_2\text{Cl}_2]^{+2}$ is:

- * 6 * 4 * 3 * 8

12) Only one of this compound given below obeys Markownikoff rule on reaction with HCl:

- * $\text{CH}_3\text{-CH=CH}_2$ * $\text{CH}_2=\text{CH}_2$ * $\text{CH}\equiv\text{CH}$ * $\text{CH}_3\text{-CH=CH-CH}_3$

13) Unsaturated Hydrocarbon containing a double bond are called

- * Paraffins * Alkynes * Proteins * Olefines

14) The self linkage of carbon atoms is called:

- * Homologue * Catenation * Isomerism * Polymerization

15) In ethyne (C_2H_2) each carbon is ----- is hybridized:

- * dsp^3 * sp * sp^2 * sp^3

16) When acetylene is passed through red hot tube in presence of organonickel, it polymerizes to:

- * Polyethene * Benzene * Protein * Polyacetylene

17) Aromatic compounds burn with sooty flame because:

- * They have high percentage of carbon * They have high percentage of hydrogen atom
* They have ring structure * They resist reaction with air

18) This gas is used for ripening of fruit:

- * Ethene * Ethane * Ethanol * Ethyne

19) Formaldehyde does not undergo aldol condensation due to:

- * Presence of β -carbon * Absence of α -hydrogen
* Absence of ketonic group * Absence of -OH group

20) This is an example of oligosaccharides:

- * Glucose * Fructose * Maltose * Starch

21) This will give Iodoform reaction on the treatment with Na_2CO_3 and I_2 :

- * Acetic acid * Acetone * Acetic Anhydride * Methanol

22) The body store part of glucose for rainy days in-----in form of glucose:

- * Liver * Lungs * Kidney * Heart

23) The colour of transition metal complexes is due to

- * d-d transition of electrons * ionization
* loss of s-electron * diamagnetic nature

24) Laughing gas is chemically:

- * NO * N_2O
* NO_2 * N_2O_4

25) Which element forms an ion with charge +3:

- * Be * Al
* O * Na

26) Nelson cell is used to prepare:

- * Sodium Carbonate * Sodium Metal
* Sulphuric Acid * Chlorine

27) Which one of the following does not belong to alkaline earth metal

- * Be * Ra
* Ba * Pb

28) The hybridization in the carbon atom of carbonyl group is:

- * sp^3 * sp^2
* sp * dsp^3

29) β, β' – dichloro diethyl sulphide is commonly known as:

- * Biogas
- * Mustard gas
- * Marsh Gas
- * phosgene gas

30) The presence of double bond in a compound is the sign of:

- * Saturation
- * Substitution
- * unsaturation
- * Combustion

31) The benzene molecules contains:

- * Four double bonds
- * One double bond
- * Two Double bonds
- * Delocalized π electrons

32) benzene cannot undergo:

- * Substitution reactions
- * oxidation reactions
- * addition reactions
- * elimination reactions

33) ethanol can be converted into ethanoic acid by:

- * Hydration
- * Oxidation
- * Hydrogenation
- * Fermentation

34) It is not a nucleophile:

- * OH^{-1}
- * SH^{-1}
- * CN^{-1}
- * BF_3

35) The hydrofluoric acid (HF) is used to make design on glass surface this process is called:

- * Knocking
- * hydrogenation
- * etching
- * Supplementation

36) The polymer named bakelite is the product of formaldehyde and:

- * Acetylene
- * Phenol
- * PVC
- * Vinyl Cyanide

37) E.D.T.A is this type of Ligand:

- * bidentate
- * hexadentate
- * tetradentate
- * tridentate

38) This element has greatest tendency to lose electrons:

- * Be
- * Na
- * Li
- * Cs

39) Alkali metals acts as:

- * reducing agent
- * Oxidizing agent
- * Bleaching agent
- * Nitrating Agent

40) Galvanized iron is protected against rusting by a thin layer of:

- * Cr
- * Pb
- * Sn
- * Zn

41) The metallic character of p-block elements depends electron population of outermost shell and

- * Hydration energy
- * Ionization potential
- * Electron affinity
- * Oxidation number

42) Tollen's reagent is:

- * Ammonical cuperous oxide
- * Ammonical silver oxide
- * Ammonical silver nitrate
- * Ammonical silver bromide

43) Acetone is formed by oxidation of:

- * Primary Alcohol
- * Tertiary Alcohol
- * Secondary Alcohol
- * Ether

Section 'B' (Short Answer Questions)

(Marks: 25)

NOTE: Attempt five questions from this section in all, selecting at least two questions from Inorganic chemistry and two from organic chemistry. All questions carry equal marks.

INORGANIC CHEMISTRY

Q2 (i) Refer to the list of given compounds.

Compound	A	B	C	D
Specific Name	Dolomite	Whitrite	Blue vitriol	Potash Alum

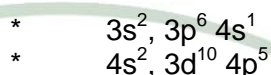
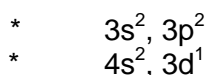
- * Write the formula of A & B.
- * Write the equation when C is heated up to 230 °C
- * Write the chemical formula of D and also write two uses.

(ii) Write the IUPAC names of the following.

- * $K_3[Fe(CN)_6]$
- * $[Cr(NH_3)_3Cl_3]$
- * $[Zn(OH)_4]^{-2}$
- * $[Ni(en)_2Cl_2]$

(iii) Why Hydrogen gas cannot be placed in Group I A and VII A of the periodic table (at least four point for each)

(iv) Identify the groups of the periodic table that have following ground state electronic configuration in their outer most shell



(v) Describe the extraction of sodium from rock salt on industrial scale

(vi) What happens when (write equation)

- * Nitric acid reacts with Phosphorous
- * Sodium reacts with oxygen
- * Carbon mono oxide is treated with chlorine
- * Aluminum is treated with H_2SO_4 (conc.)

ORGANIC CHEMISTRY

(vii) Define the following.

- * Glycosidic linkage
- * Aromaticity
- * Plasticizer
- * Homologous series

(viii) Define the Polymerization and Isomerism. Identify the following pair of compounds as Isomers and which pair contains polymer

- * Glucose and Starch
- * CH_3-O-CH_3 and CH_3-CH_2-OH
- * CH_3-CH_2-CHO and $CH_3-CO-CH_3$
- * Vinyl Chloride and PVC

(ix) How can we prepare following compounds (any four)

- * ethylene glycol from ethene
- * phenyl hydrazone from formaldehyde
- * White solid from Acetylene
- * ethane from chloro methane
- * ethene from ethane

(x) Write the IUPAC names of the following (any four)

- * $CH_3-CH(CH_3)-CH(CH_3)-CH_3$
- * $CH_2=C(CH_3)-CH(CH_3)-C\equiv CH$
- * $CH_3-CH(CH_3)-CH(Cl)-CHO$
- * $(CH_3)_3C.CO-CH_2CH_3$
- * CHI_3

(xi) Why benzene gives electrophilic substitution reaction. Discuss acylation of Benzene with mechanism.

(xii) What happens when, (write only equation)

- * Acetylene reacts with water in presence of H_2SO_4 and HgSO_4 at 75°C .
- * Formaldehyde is polymerized in presence of H_2SO_4
- * Vapors of acetic acid are passed over MnO_2 at 500°C .
- * Ethanol in excess is heated in presence of H_2SO_4 .

SECTION 'C' (Detailed-Answer Questions)

(Marks: 17)

NOTE: Attempt any two questions from this section, one from organic and one from inorganic chemistry.

Inorganic Chemistry

Q3. Describe the extraction of 99.99% pure Aluminum from bauxite ore containing SiO_2 and Fe_2O_3 as Impurities. (8)

Q4. The following chart represents stages in manufacture of HNO_3 (8)



- * Describe the chemical process in stage A along with the conditions for maximum conversion.
- * Describe the process in C and D.
- * How 98% concentrated HNO_3 is obtained.
- * How gold is dissolved in aqua regia (write equations only)

OR

Define d-Block elements, why they are called transition elements? Discuss the following properties of d-Block elements.

- * Variable Oxidation States
- * Magnetic Properties
- * Catalytic Properties

ORGANIC CHEMISTRY

Q5. Explain the reaction mechanism of S_N^1 and S_N^2 reactions. Write equations to prepare the following compounds from ethyl bromide? (9)

- * $\text{C}_2\text{H}_5\text{SH}$
- * $\text{C}_2\text{H}_5\text{O C}_2\text{H}_5$
- * $\text{C}_2\text{H}_5\text{CN}$

Q6. Define denatured and absolute alcohol. What is fermentation and how ethyl alcohol manufactured by fermentation of the following? (9)

- * Starch
- * Molasses

OR

Discuss the effect of substituent group (G) already present on benzene ring on the entry of the second substituent. Prepare the following compounds from benzene.

* m-nitrobenzoic acid

* o and p- nitrotoluene

