

BOARD OF INTERMEDIATE EDUCATION, KARACHI

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INTERMEDIATE EXAMINATION, 2023 (SUPPLEMENTARY / ANNUAL - II)

CHEMISTRY PAPER - II

(Science Pre-Engineering & Pre-Medical Groups)

Max. Marks: 85

Time: 3 Hours

Date: 16/02/2023
2:00 p.m. to 5:00 p.m.

SECTION 'A'

(MULTIPLE CHOICE QUESTIONS) - (M.C.Q.s)

(Marks: 33)

NOTE:

MCQs Code : 01

- i) This section consists of 33 part questions and all are to be answered. Each question carries one mark.
- ii) This Section 'A' of Multiple Choice Questions (MCQs) must be solved on the provided OMR sheet.
- iii) The correct answer bubble must be filled on OMR sheet.
- iv) Use only blue/black ball point pen on OMR sheet.
- v) Avoid pencil, white-out pen, correction pen, ink remover and gel pen to solve the question on OMR sheet.

1. Choose the correct answer for each from the given options:

- 1) The element with valence shell configuration $4s^2$ belongs to:

A) IVA group, 2 nd period	B) IV group, 2 nd period
C) VA group, 2 nd period	D) IIA group, 4 th period
- 2) The ratio of electron, proton and neutron in tritium is:

A) 1:1:1	B) 1:1:0	C) 1:1:2	D) 1:1:3
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- 3) Aqua regia is a mixture of HNO_3 and HCl in the ratio by volume is:

A) 1:1	B) 1:2	C) 1:3	D) 3:1
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- 4) Ammonal is a mixture of:

A) NH_3 and H_2O	B) Al powder and Al nitrate
C) Cu and Zn	D) Na and Hg
- 5) This metal reacts with HNO_3 to form laughing gas:

A) Al	B) Mg	C) Zn	D) Cu
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- 6) The substance contains two or more metals is called:

A) Ore	B) Alloy	C) Allotrope	D) Polymorph
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- 7) Electronic configuration of an element completes in $3p^1$ its atomic number is:

A) 11	B) 12	C) 13	D) 14
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- 8) This is not a monodentate ligand:

A) H_2O	B) NH_3	C) en	D) CN^-
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- 9) This is an example of oligosaccharides:

A) Glucose	B) Fructose	C) Maltose	D) Starch
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- 10) This chemical formula $Al_2O_3 \cdot 3H_2O$ is of:

A) Bauxite	B) Gibbsite	C) Diaspore	D) Corundum
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- 11) This alloy of Aluminum is used in making aeroplanes:

A) Magnelium	B) Duralumin	C) Alnico	D) Aluminum Bronze
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- 12) Permanent hardness of water is removed by:

A) Baking Soda	B) Washing Soda	C) Caustic Soda	D) Lime Water
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- 13) Elements belonging to the same group are:

A) Ca and Na	B) Ca and Be	C) Ca and Li	D) Ca and K
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- 14) Formula of Dolomite is:

A) $MgCO_3$	B) $MgCl_2$	C) $CaCO_3$	D) $MgCO_3 \cdot CaCO_3$
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- 15) Kipp's Apparatus is used to prepare this gas:

A) SO_2	B) H_2S	C) HCl	D) Cl_2
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- 16) Chemical composition of Colemanite is:

A) $Ca_2B_6O_{11} \cdot 5H_2O$	B) $Na_2B_4O_7 \cdot 4H_2O$
C) $CaB_2O_7 \cdot 4H_2O$	D) $CaNaB_3O_7 \cdot 8H_2O$
- 17) Condensed polymer of phenol and formaldehyde is called:

A) PVC	B) Terylene	C) Bakelite	D) Nylon
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- 18) Isomer of ethanol is:

A) C_2H_6	B) CH_3COOH	C) $H_3C \cdot CO \cdot CH_3$	D) $H_3C \cdot O \cdot CH_3$
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- 19) Phenol by reduction forms this:

A) Toluene	B) Benzene	C) Benzoic Acid	D) Alkane
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- 20) Isopropyl alcohol on oxidation forms
A) Acetone B) Acetic Acid C) Ethanol D) Ester
- 21) It is not a nucleophile.
A) OH^- B) CN^- C) H_2O D) BF_3
- 22) This group is meta directing.
A) $-\text{R}$ B) $-\text{COOR}$ C) $-\text{OR}$ D) $-\text{X}$
- 23) Glucose and Fructose are:
A) Position Isomers B) Chain Isomers
C) Metamers D) Functional Group Isomers
- 24) Blood clotting mechanism is failed by the deficiency of this vitamin:
A) K B) B_1 C) B_6 D) C
- 25) Ester linkage is present in:
A) Protein B) Terylene C) Nylon D) Viscose Rayon
- 26) When methyl magnesium iodide reacts with this forms 2° propyl alcohol:
A) Propanol B) Butanol C) Ethanal D) Acetone
- 27) This reagent cannot be used in the preparation of alkyl halides from alcohols:
A) PCl_5 B) $\text{K}_2\text{Cr}_2\text{O}_7 / \text{H}_2\text{SO}_4$
C) SOCl_2 D) $\text{HCl} / \text{ZnCl}_2$
- 28) Cycloalkanes have the general formula:
A) $\text{C}_n\text{H}_{2n+2}$ B) $\text{C}_n\text{H}_{2n-2}$ C) C_nH_{2n} D) $\text{C}_n\text{H}_{2n+1}$
- 29) This imparts green colour to glass:
A) CoO B) MnO_2 C) CuO D) Cr_2O_3
- 30) The acid used for etching of glass is:
A) HF B) HI C) HBr D) HCl
- 31) Ethyl acetate is present in:
A) Orange B) Pineapple C) Guava D) Lemon
- 32) The most stable carbonium ion is:
A) CH_3^+ B) $\text{CH}_3-\text{CH}_2^+$ C) $(\text{CH}_3)_2\text{CH}^+$ D) $(\text{CH}_3)_3\text{C}^+$
- 33) A mixture of 85% Ethanol, 11% water and 4% methanol is called:
A) Absolute Alcohol B) Rectified Spirit C) Methylated Spirit D) Vinegar

Continued section (B & C) on page 3

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SECTION 'B'

(SHORT-ANSWER QUESTIONS) Marks : 32

Note: Answer any Eight part questions. Select Four part questions from Inorganic Chemistry and Four part questions from Organic Chemistry. All questions carry equal marks.

INORGANIC CHEMISTRY

2. Write Electronic configuration and identify Block, Group and Period of the elements having the following atomic numbers

24 18 29 43

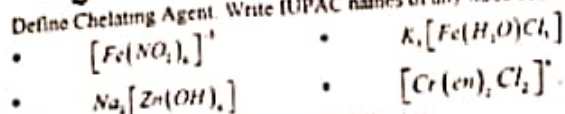
Refer to the list of given compounds

Compound	A	B	C	D
Specific Name	Lunar Caustic	Hypo	Bleaching Powder	Chrome Yellow

Write

- Chemical formula of B and C
- One equation for the preparation of D.
- Equation for the reaction when A is heated at 450°C .
- Give one common use of C

iii) Define Chelating Agent. Write IUPAC names of any three of the following complexes:



Give any four scientific reasons of the following:

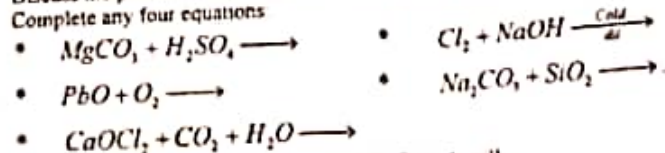
- NH_3 and H_2O act as ligand but NH_4^+ and H_3O^+ do not.
- Alkali metals are powerful reducing agent.
- Boric acid is soft and slippery
- Caustic Soda is prepared separately in Castner cellner cell
- Most of the transition metals are paramagnetic

Discuss any two of the following properties of transition elements:

- Formation of coloured complexes
- Catalytic property
- Co-ordination complex formation

Discuss the position of hydrogen with respect to IA group

Complete any four equations



viii) Describe the extraction of sodium metal by Down's cell.

ORGANIC CHEMISTRY

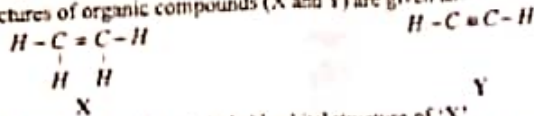
Define any four of the following

- Catenation
- Metamerism
- Heterocyclic Compounds
- Zwitterion
- Aromaticity

What is organometallic compound? How can you prepare the following starting from $\text{CH}_3\text{-I}$?

- Ethane
- Ethanoic Acid
- Sec-Propyl Alcohol

xi) The structures of organic compounds (X and Y) are given as



- Draw and explain the hybrid orbital structure of 'X'.
- Write equations for the preparation of X and Y from 1,2-dichloroethane.

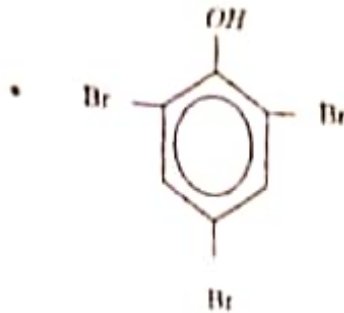
xii) Write simple chemical test to distinguish between the following:


- Alkane and Alkene
- Aldehyde and Ketone
- Ethene and Ethyne
- Alkane and Alkyl halide

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- xiii) Write equation for the following reactions.
- Acetic acid vapours passed over MnO_2 at $500^\circ C$
 - Reaction of isopropyl chloride with sodium metal in presence of anhydrous ether.
 - Action of ether with sulphur monochloride
 - Ethyne is hydrolyzed in presence of $HgSO_4$ and H_2SO_4 at $75^\circ C$.
- xiv) Write IUPAC names any four of the following.
- $(CH_3)_2C=CO-CH(CH_3)_2$
 - $(CH_3)_2C=O-CH_2-CH_3$
 - $CH_2=CH-CH(CH_3)-CH=CH-COOH$
 - $CH_2=CH-CH(CH_3)-C\equiv CH$



- xv)  What are Electrophiles? Give the reaction mechanism of halogenation and nitration of benzene.
 Give the biological importance of Carbohydrate.

SECTION 'C'

(DETAILED-ANSWER QUESTIONS) Marks : 20

Note: Answer any Two questions — One question from Inorganic Chemistry and the other from Organic Chemistry. Both questions carry equal marks

INORGANIC CHEMISTRY

1. a) How is caustic soda manufactured from Castner Kellner process. Write the advantages and disadvantages of the process.
 b) What is meant by Hydrides? Give their classification and discuss in detail the covalent hydrides.
2. a) Describe the manufacture of oil of vitriol by contact process with diagram.
 b) What is Metallurgy? Describe the extraction of 99.99% pure copper from roasted pyrite.

ORGANIC CHEMISTRY

3. a) What is β -elimination reaction? Discuss the mechanism of E_1 and E_2 reactions.
 OR
 Explain the molecular orbital treatment of Benzene
4. b) Write any five structural formula of the following compound
- | | | |
|-------------------|---------------------------------|--------------------------|
| • Pyrogallol | • Phenyl Hydrazine | • Picric Acid |
| • Triphenyl Amine | • β -methyl butyraldehyde | • Tert-butyl ethyl ether |
| • Aspartic Acid | | |
5. a) What is Fermentation? Give industrial preparation of ethanol from Starch and Molasses.
 b) Complete the following equations.

