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Sig. of Candidate. _____

Answer Sheet No. _____

Sig. of Invigilator. _____

CHEMISTRY HSSC-II

SECTION – A (Marks 17)

Time allowed: 25 Minutes

NOTE: Section-A is compulsory and comprises pages 1–2. All parts of this section are to be answered on the question paper itself. It should be completed in the first 25 minutes and handed over to the Centre Superintendent. Deleting/overwriting is not allowed. Do not use lead pencil.

Q. 1 Circle the correct option i.e. A / B / C / D. Each part carries one mark.

(i) What is the correct order of second ionization potential of C, N, O and F?

A. $O > N > F > C$

B. $O > F > N > C$

C. $C > N > O > F$

D. $F > O > N > C$

(ii) Epsom salt is a mineral of the metal _____

A. Calcium

B. Sodium

C. Magnesium

D. Strontium

(iii) In P-Type semiconductor, silicon is doped with _____

A. Copper

B. Nitrogen

C. Phosphorous

D. Boron

(iv) Which of the following is the strongest alkali?

A. $Ca(OH)_2$

B. $NaOH$

C. KOH

D. $Ba(OH)_2$

(v) Reaction of Oxalic acid with conc. H_2SO_4 produces _____

A. CO_2

B. CO

C. Both CO and CO_2

D. No reaction occurs

(vi) Which of the following is the strongest acid?

A. $HClO$

B. $HClO_2$

C. $HClO_3$

D. $HClO_4$

(vii) Polyethylene, polyvinyl acetate and starch are _____

A. Copolymers

B. Homopolymers

C. Addition polymers

D. Condensation polymers

(viii) Which is the final product of rotary kiln in cement manufacturing?

A. Cement

B. Slurry

C. Cement Clinker

D. Mortar

- (ix) Ecosystem is smaller unit of _____
- A. Lithosphere B. Biosphere
C. Hydrosphere D. Atmosphere
- (x) Which of the following is α -decay product of the radium?
- A. He B. Kr
C. Ne D. Xe
- (xi) In Open Hearth process, dolomite is used if the impurities present are _____
- A. Mn, Si B. C, Si
C. P, S D. P, Cl
- (xii) The compound which is **NOT** isomeric with diethyl ether is _____
- A. Butanone B. 2-Methyl propane-2-ol
C. Butane-1-ol D. None of these
- (xiii) Which organic compound can behave as an acid too?
- A. C_2H_4 B. $CH_3 - CH = CH_2$
C. $CH_3 - C \equiv C - CH_3$ D. $CH_3 - C \equiv C - H$
- (xiv) A glyoxal is formed due to reaction of benzene with (a/an) _____
- A. Aldehyde B. Ketone
C. Ozone D. Oxygen gas
- (xv) Which of the following is **NOT** a nucleophile?
- A. H_2O B. H_2S
C. BF_3 D. NH_3
- (xvi) Which of the following enzymes is **NOT** involved in fermentation of starch?
- A. Diastase B. Zymase
C. Urease D. Maltase
- (xvii) Ketones are less reactive than aldehydes. Which of the following reagents will react with both aldehydes and ketones?
- A. Tollen's reagent B. Fehling's reagent
C. Grignard reagent D. Benedict's reagent

For Examiner's use only:

Total Marks:

17

Marks Obtained:



CHEMISTRY HSSC-II

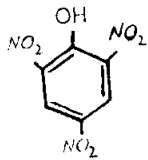
Time allowed: 2:35 Hours

Total Marks Sections B and C: 68

NOTE: Sections B and C comprise pages 1 – 2. Answer any fourteen parts from Section 'B' and any two questions from Section 'C' on the separately provided answer book. Use supplementary answer sheet i.e. Sheet-B if required. Write your answers neatly and legibly.

SECTION – B (Marks 42)

Q. 2 Attempt any FOURTEEN parts. The answer to each part should not exceed 5 to 6 lines. (14 x 3 = 42)

- (i) a. Why does the metallic character increase from top to bottom in a group? 01
 b. Give reason for the statement: "Lanthanides contraction controls the atomic size of element of 6th and 7th period". 02
- (ii) a. Why is the aqueous solution of soda ash alkaline in nature? 01
 b. How is Down's cell process better than other processes used for the manufacturing of sodium metal? 02
- (iii) Discuss the anomalous behaviour of Boron with respect to the members of its own group. 03
- (iv) Why is silicone oil preferred over ordinary lubricants? 03
- (v) Both CO_2 and SiO_2 are oxides of group IV A elements. However, CO_2 exists as a gas and SiO_2 exists as a solid. Explain. 03
- (vi) How does nitric acid oxidize the non-metals? Give three examples in the form of balanced chemical equations 03
- (vii) Halogens form a homologous series but fluorine differs from the other halogens in many respects. Discuss. 03
- (viii) a. What are Chelates? Give an example. 1.5
 b. How is chromate ion (CrO_4^{2-}) converted into dichromate ion ($Cr_2O_7^{2-}$)? 1.5
- (ix) a. Give all possible isomers of C_5H_{12} . 1.5
 b. What are homocyclic and heterocyclic Hydrocarbon? Give an example of each 1.5
- (x) How is 2-Butene prepared from: 03
 a. An alkyl halide b. Vicinal dihalide
- (xi) Briefly explain the difference between Lindlar's catalyst and Raney-Nickle catalyst with respect to their composition and use. 03
- (xii) Write the names of following aromatic compounds. 03
 $C_6H_5-O-C_6H_5$; $C_6H_5-CH_2-C_6H_5$; 
- (xiii) How is Grignard Reagent used for the preparation of alkanes? Give any three examples with reaction. 03
- (xiv) a. Absolute alcohol can not be prepared by fermentation of molasses. Give reason. 1.5
 b. How is alcohol denatured? 1.5
- (xv) Give a reaction example of disproportionation reaction of aldehyde. 03
- (xvi) Amino acids are simplest protein. Amino acids show dual character both as an acid and base. Give a reaction example to show their dual nature. 03
- (xvii) What are the responsibilities of nucleic acids? What type of nucleic acids have been discovered? 03
- (xviii) How is ozone affected by chloroflouro carbons? Briefly explain. 03
- (xix) Give a general mechanism for the base-catalysed nucleophilic addition reaction of carbonyl compounds. 03

SECTION – C (Marks 26)

- Note:** Attempt any TWO questions. All questions carry equal marks. (2 x 13 = 26)
- Q. 3**
- a. How is bleaching powder prepared by Beckmann's method? 04
 - b. What is sacrificial corrosion? Explain with an example. 03
 - c. How does $KMnO_4$ oxidize the following:
 H_2S , $FeSO_4$, Oxalic acid 03
 - d. Determine the charge on central metal atom of the following complexes:
 $[PtCl(NO_2)(NH_3)_2]^{2+}$; $[Fe(CN)_6]^{3-}$; $[Ni(CO)_4]$ 03
- Q. 4**
- a. Give any two chemical tests to distinguish between 1-Butene and 1-Butyne. 2+2
 - b. How will you bring about the following conversion:
(i) Methane to Ethane (ii) Ethane to Methane 2+2
 - c. How do tertiary alkyl halide undergo nucleophilic substitution reaction? Give a detailed general mechanism. 03
 - d. Show by diagram the industrial preparation of Methanol. 02
- Q. 5**
- a. What are Lipids? In what ways are fats and oil different? 04
 - b. Discuss the hydrolysis of triglyceride and reaction of triglyceride with an alkali. 03
 - c. How does acid deposition occur? What are its effects on environment? 03
 - d. Write the structural formulas of the following organic compounds: 03
Iso-butyl alcohol ; Malonic acid ; Vinyl Chloride

— 2HA 1309 (L) —

DO NOT WRITE ANYTHING HERE

- (x) Which of the following compounds does **NOT** have any position isomer?
- A. Butyne B. Propanol
C. Propene D. Dichlorobenzene
- (xi) Which of the following is the purest form of iron?
- A. Cast iron B. Pig iron
C. Wrought iron D. Steel
- (xii) Halogen acids are strong acids. Which of the following halogen acids can **NOT** be kept in the glass bottle?
- A. HCl B. HF
C. HBr D. HI
- (xiii) Moist ammonia gas can only be dried up by _____
- A. Quick lime B. Ortho Sulphuric acid
C. Nitric acid D. Anhydrous calcium sulphate
- (xiv) Metals can displace hydrogen from acid. However, which of the following metals can **NOT** displace hydrogen from dilute nitric acid?
- A. Mg B. Mn
C. Cu D. Na
- (xv) Trona is a mineral of _____
- A. Potassium B. Sodium
C. Magnesium D. None of these
- (xvi) Oxides of strongly electronegative elements are _____
- A. Basic B. Acidic
C. Neutral D. Amphoteric
- (xvii) China-ware are made from a mixture of Kaolin, bone ash and _____
- A. Sodium silicate B. Talc
C. Feldspar D. Quartz

For Examiner's use only:

Total Marks:

17

Marks Obtained:

— 2HA 1309 (ON) —



CHEMISTRY HSSC-II

Time allowed: 2:35 Hours

Total Marks Sections B and C: 68

NOTE: Sections 'B' and 'C' comprise pages 1–2 and questions therein are to be answered on the separately provided answer book. Answer any fourteen parts from Section 'B' and any two questions from Section 'C'. Use supplementary answer sheet i.e. Sheet-B if required. Write your answers neatly and legibly.

SECTION – B (Marks 42)

Q. 2 Attempt any FOURTEEN parts. The answer to each part should not exceed 5 to 6 lines. (14 x 3 = 42)

- (i) Melting and boiling points of elements increase from left to right up to middle of the periodic table and decrease onward. Give reason. 03
- (ii) Briefly explain the Borax bead test and its chemistry. 03
- (iii) Sodium metal is obtained on commercial level by the Down's cell. Draw a labelled diagram of Down's cell which clearly elaborates the extraction of sodium metal. 03
- (iv) What is Mortar? 03
- (v) Nitric acid is mostly used in the manufacture of fertilizers and explosive. However, it can also be used to dissolve noble metals such as gold and platinum. Briefly explain the chemistry of this property. 03
- (vi) a. Orthophosphoric acid is a deliquescent crystalline solid. On heating it, about at 316°C , what changes are produced in its composition. 01
b. Oil of vitriol is extensively used in industrial processes. However, it can also be used as dehydrating agent. Give two examples of this property. 02
- (vii) All the free halogens act as oxidizing agent when they react with metals or non-metals. Give order of oxidizing power of halogens. Also briefly explain the factors which are responsible for oxidizing power. 03
- (viii) Give systematic IUPAC names to the following compounds:
 $K_4[Fe(CN)_6]$; $[Fe(CO)_5]$; $[PtCl(NO_2)(NH_3)_4]SO_4$ 03
- (ix) a. Coal is an important solid fuel and becomes a source of organic compounds when subjected to destructive distillation. Briefly express. 01
b. Give structures and IUPAC names of geometric isomers of the following:
2 – Pentene ; 1-Bromo-2-chloropropene. 02
- (x) Halogenation of alkanes is believed to proceed through free radical mechanism. How is this reaction completed? Give all possible steps with mechanism. 03
- (xi) What happens when: 03
a. A mixture of benzene vapours and air passes over heated vanadium penta oxide
b. Chlorine is passed through benzene in sunlight
c. Benzene is treated with ozone
- (xii) How will you carry out the following conversions:
a. $CH_3-CH_2-CH_2-Cl \rightarrow CH_3-CH=CH_2$ 01
b. $CH_3-CH_2-Br \rightarrow CH_3-CH_3$ 02
- (xiii) Grignard reagent is a reactive organic compound. Briefly discuss the reactivity and structure of Grignard reagent. 03

