Roll No. | | | | | | | Answer Sheet No._____

Sig. of Candidate._____ Sig. of Invigilator._____

CHEMISTRY HSSC–II

SECTION – A (Marks 17)

Time allowed: 25 Minutes *(Revised Syllabus)*

NOTE: **Section–A is compulsory. 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) The component of blood that carries oxygen in the body is:
A. Hemoglobin B. Fats C. Amino acids D. Myoglobin

(ii) Nail polish remover base commonly contains a mixture of two organic solvents:
A. Benzene and CS_2 B. Ethyl acetate and acetone
C. Ethyl acetate and CS_2 D. Benzene and acetone

(iii) Which of the following gases is not pollutant?
A. CO B. NO_2 C. SO_2 D. CO_2

(iv) Which of the following oxides is amphoteric in nature?
A. CO_2 B. SnO_2 C. BeO D. MgO

(v) Which one of the following shows high boiling point?
A. HCl B. HF C. HBr D. HI

(vi) The carbonates of alkali metals are not affected by heat except:
A. K_2CO_3 B. Na_2CO_3 C. Li_2CO_3 D. Rb_2CO_3

(vii) In Oxidation of chromium III to chromium VI, the green colour will change into:
A. Colourless B. Bright yellow C. Blue D. Pink

(viii) When $AgNO_3$ is added to lessaigne's solution, which colour is formed for iodine?
A. Deep Yellow B. Green C. Blue D. Violet

(ix) The electrophile in aromatic sulphonation is:
A. HSO_4^- B. H_2SO_4 C. SO_3 D. SO_4^{-2}

(x) Sodalime is:
A. $NaOH$ and CaO B. KOH
C. Na and $Ca(OH)_2$ D. $NaOH$

(xi) Geometrical Isomerism is shown by:
A. Lactic acid B. Maleic acid
C. 1,1-Dichloroethylene D. 1-Butene

(xii) SN_2 reactions can be best carried out with:
A. Secondary alkyl halide B. Primary alkyl halide
C. Normal alkyl halide D. Tertiary alkyl halide

(xiii) $CH_3-CH_2-CH_2-Br$ on treatment with alcoholic KOH gives:
A. Propane B. Propene C. Propyne D. Propanol

(xiv) Phenol is more acidic than alcohol. Which statement is correct?
A. Phenoxide ion is stabilized due to resonance
B. Phenol turns blue litmus paper red
C. Alkoxide ion is stabilized due to resonance
D. Alocohol librates CO_2 with carbonate solution

(xv) Cannizaro's reaction is not given by:
A. Benzaldehyde B. Acetaldehyde
C. Trimethyl acetaldehyde D. Formaldehyde

(xvi) Which of the following can be prepared in the laboratory by dry distillation of $(HCOO)_2Ca$?
A. CH_3CHO B. CH_3OH C. $CH_2=CH_2$ D. $HCHO$

(xvii) Which of the following can not be prepared directly from acetic acid?
A. Acetamide B. Acetic acid C. Ethyl acetate D. Acetyl chloride

For Examiner's use only:

Total Marks: 17

Marks Obtained:

CHEMISTRY HSSC–II

(Revised Syllabus)

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

(i) Magnesium burns in steam with its typical flame.

a. Write reaction to verify this statement. **02**

b. What is the colour of flame? **01**

(ii) Aluminum oxide is an amphoteric oxide. It has reactions both as a base and an acid. Justify this statement by providing chemical reactions. **03**

(iii) Write chemical reactions of phosphorous pentachloride in:

a. Cold water **01**

b. Boiling water **02**

(iv) Explain briefly the trend of solubility of $Be(OH)_2$ and $Mg(OH)_2$ with other elements of the same group. **03**

(v) Bromide ion reduces the concentrated sulphuric acid. Write:

a. Oxidation reaction **01**

b. Reduction reaction **01**

c. Redox reaction **01**

(vi) Vanadium (V) oxide is used as catalyst in the contact process by the reaction:

$$SO_2 + \frac{1}{2}O_2 \xrightarrow{V_2O_5} SO_3$$

How does the reaction work? Write briefly. **03**

(vii) What is meant by homologous series? Give two examples. **1+2**

(viii) How can you prepare the propene from the following? Write reactions and essential conditions.

a. Alcohol **01**

b. Alkylhalide **01**

c. Alkyne **01**

(ix) Write reactions of propene with ozone. **03**

(x) State Markonikov's rule and verify by $CH_3 - CH = CH_2 + HBr \rightarrow$ **1.5+1.5**

(xi) Write the reactions of propyne with:

a. Ammonical cuprous chloride **1.5**

b. Ammonical silver nitrate **1.5**

(xii) Write the reaction of benzene with air in the presence of varadium penta oxide at $450\ ^{\circ}C$. Also write the name of the product. **2+1**

(xiii) Give reaction mechanism of sulphonation of benzene. **03**

(xiv) How is benzene converted into trinitrotoluene? Give reactions. **1+2**

(xv) Write the action of $CH_3 - CH_2.MgBr$ with the following:

a. Methanal **1.5**

b. Butanone **1.5**

(xvi) Give reaction with essential conditions of oxidation of 2-propanol. Write IUPAC name of the product. **2+1**

(xvii) What is meant by esterfication? Explain briefly with suitable reaction. **1+2**

(xviii) What is cellulose? Give its chemical formula. **1+2**

(xix) Define the following:

a. Fungicide **01**

b. Smog **01**

c. Chromatography **01**

SECTION – C (Marks 26)

Note: **Attempt any TWO questions. All questions carry equal marks.** **(2 x 13 = 26)**

Q. 3 **a.** How does beryllium differ from other members of its group? Explain. **04**

b. Write IUPAC name of the following complexes. **04**

(i) $K3\left[Fe(CN)_6\right]$

(ii) $\left[(Co(en)_2Cl_2)\right]Cl$

(iii) $\left[PtCl(NO_2)(NH_3)_4\right]SO_4$

(iv) $Na\left[Mn(CO)_5\right]$

c. Explain the change of colour when hexaaquamanaganase II ion reacts with the following.

(i) Hydroxide ion **03**

(ii) Ammonia solution **02**

Q. 4 **a.** Explain SN_1 reaction mechanism with suitable example. **05**

b. Explain reaction mechanism of aldol condensation. **04**

c. Differentiate between amylose and amylopectin and also draw their structures. **04**

Q. 5 **a.** Explain addition polymerization and condensation polymerization by using polyvinyl chloride and Nylon 6,6 as example. **05**

b. A catalytic converter removes pollutant gases from the exhaust. How does catalytic converter work? Explain with the help of reactions. **04**

c. How is acyl chloride converted into the following?

(i) Acid anhydride **01**

(ii) Carboxylic acid **01**

(iii) Amide **01**

(iv) Ketone **01**

Roll No. | | | | | | |

Answer Sheet No._____

Sig. of Candidate._____

Sig. of Invigilator._____

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CHEMISTRY HSSC–II

SECTION – A (Marks 17)

Time allowed: 25 Minutes *(Old Syllabus)*

NOTE: **Section–A is compulsory. 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) The element **NOT** present in all proteins is:
A. Hydrogen B. Nitrogen C. Sulphur D. Carbon

(ii) The reaction between fat and caustic soda is called:
A. Hydrogenolysis B. Fermentation C. Saponification D. Esterifiction

(iii) Aldehydes are prepared by:
A. Oxidation of alcohol B. Reduction of Ketone
C. Reduction of Ester D. Reduction of alcohol

(iv) Electron affinity is a measure of:
A. Energy required to excite electron
B. Energy released during addition of electron
C. Energy released during de-excitation of electron
D. Energy required to remove electron

(v) Which one of the Sulphate is water soluble?
A. Lead Sulphate B. Strontium Sulphate
C. Magnesium Sulphate D. Barium Sulphate

(vi) The catalyst used in contact chamber process is:
A. Vanadium pentoxide B. Sulphur trioxide
C. Silver oxide D. Ferric Oxide

(vii) The element belongs to group IV-A is:
A. Nitrogen B. Lead C. Oxygen D. Barium

(viii) Which is the strongest oxy-Acid of chlorine?
A. $HClO_2$ B. $HClO_3$ C. $HClO_4$ D. $HClO$

(ix) Co-ordination number of platinum in $\left[Pt\ Cl\ (NO_2)(NH_3)_4\right]^{2+}$ is:
A. 4 B. 1 C. 6 D. 2+

(x) Central carbon atom in tertiary butyl alcohol is:
A. Sp^2 – Hybridized B. Sp – Hybridized
C. dsp^2 – Hybridized D. Sp^3 – Hybridized

(xi) Vinyl acetylene combines with concentrated HCl to form:
A. Benzene B. Chloroprene
C. Divinyl acetylene D. Polyacetylene

(xii) During Nitration of benzene, the active nitrating agent is:
A. NO_2^+ B. NO_2^- C. HNO_3 D. NO_3^-

(xiii) Which one of the following is **NOT** a nucleophile?
A. H_2S B. BF_3 C. NH_3 D. H_2O

(xiv) Which of the following derivatives cannot be prepared directly from Acetic acid?
A. Acetyl chloride B. Acetamide C. Acetic anhydride D. Ethyl acetate

(xv) Tollen's test is given by:
A. Acetaldehyde B. Acetic acid C. Methyl acetate D. Acetone

(xvi) According to Lewis concept ethers behave as:
A. Base B. Amphoteric compound
C. Oxidizing agent D. Acid

(xvii) The reagent used to reduce carboxylic acid to an alcohol is:
A. H_2 / Pt B. $LiAl\,H_4$ C. $K_2Cr_2O_7 / H_2SO_4$ D. H_2 / Ni

For Examiner's use only:

Total Marks: 17

Marks Obtained:

CHEMISTRY HSSC–II

(Old Syllabus)

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

(i) What is meant by Oxidation state of an atom? How does it vary in a period of periodic table? **1+2**

(ii) Why is Li_2CO_3 unstable, while carbonates of other alkali metals are stable towards heat? **03**

(iii) Explain briefly chemistry of Borax Bead test. **03**

(iv) How does concentrated Nitric acid react with the following?

a. Sb (Antimony) b. C (Carbon) c. P (Phosphorus) **1+1+1**

(v) Write down formulae of oxy-acids of Boron. Also arrange them in order of increasing acidic strength. **2+1**

(vi) Write the names of following complexes: **1+1+1**

a. $K_3[Fe(CN)_6]$ b. $[Pt\,Cl(NO_2)(NH_3)_4]SO_4$ c. $[Co(NO_2)_3(NH_3)_3]$

(vii) What is knocking and how can it be avoided? **1+2**

(viii) Convert 2-butyne into: **1.5+1.5**

a. cis-2-butene b. Trans-2-butene

(ix) Explain briefly with reaction mechanism, the conversion of Benzene into Acetophenone. **03**

(x) How does Xenon react with the following: a. Fluorine b. Oxygen **1.5+1.5**

(xi) Give stepwise conversion of $CH_3 - Mg - Br$ into CH_3COOH **03**

(xii) Absolute alcohol cannot be prepared by the process of fermentation. Why? **03**

(xiii) Arrange the following compounds in order of their increasing acidic strength by giving reasons: H_2O, C_2H_5OH, C_6H_5OH, C_6H_5COOH **03**

(xiv) How does Acetone give Iodoform reaction and what is its observation? **2+1**

(xv) Give reaction mechanism for the reaction of 2,4-DNPH with Acetaldehyde. **03**

(xvi) Draw the structural formulae for the following amino acids:

a. Alanine b. Aspartic acid c. Lysine **1+1+1**

(xvii) Draw structural formulae of glucose and fructose and by their reaction prepare sucrose. **2+1**

(xviii) What is Smog? Explain briefly the chemicals causing photochemical smog. **1+2**

(xix) Explain briefly the process of incineration used for industrial waste to dispose it. **03**

SECTION – C (Marks 26)

Note: Attempt any TWO questions. All questions carry equal marks. (2 x 13 = 26)

Q. 3 a. What were major problems faced during electrolysis of brine and how were these problems resolved? **2+4**

b. Explain chemistry of thermal decomposition of orthoboric acid. **03**

c. Define following terms with examples:

(i) Co-ordination number (ii) Co-ordination sphere **2+2**

Q. 4 a. Define structural isomerism. Explain with examples: (i) Metamerism (ii) Tautomerism **1+2+2**

b. How can ethylene be converted into: **2+2**

(i) Acetaldehyde (ii) Glyoxal

c. What is Aldol condensation reaction? Explain the formation of Crotonaldehyde from acetaldehyde by giving reaction mechanism. **04**

Q. 5 a. How will you bring about following conversions?

(i) Ethene into Ethanol **02**

(ii) Ethanol into ethanoic acid **02**

(iii) Propanoic acid into Alanine **02**

b. Define paper. Explain its industrial preparation with diagram. **1+6**