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Answer Sheet No. _____

Sig. of Candidate. _____

Sig. of Invigilator. _____

26

CHEMISTRY HSSC-II

SECTION – A (Marks 17)

Time allowed: 25 Minutes

(Revised Syllabus)

Version Number 1 7 0 3

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) Which of the following is not present in acid rain?
A. CH_3COOH B. HNO_3 C. H_2CO_3 D. H_2SO_4
- (ii) Which region of electromagnetic spectrum is involved in NMR spectroscopy?
A. Radio waves B. Ultraviolet C. Visible D. Microwaves
- (iii) Which of the following compounds gives an acidic solution with water?
A. $BaCl_2$ B. $SiCl_4$ C. $NaCl$ D. KCl
- (iv) When a Complex reflects back whole of white light, its colour will be:
A. Green B. Red C. White D. Black
- (v) Which of the following oxide is used as a Catalyst in Contact process?
A. V_2O_5 B. P_2O_5 C. Fe_2O_3 D. Mn_2O_3
- (vi) Full name of Bucky Balls is:
A. Buckminster Carbenes B. Buckminster Abbey
C. Buckminsterenes D. Buckminster Fullerenes
- (vii) Which of the following alcohols will be most easily dehydrated to give an alkene?
A. 3 – propanol B. 2 – methyl – 2 – propanol
C. 1 – propanol D. 2 – propanol
- (viii) Benzoic acid is obtained by the oxidation of:
A. p-Xylene B. m-Xylene C. Benzene D. Toluene
- (ix) Which of the following alkyl halides cannot be formed by direct reaction of alkanes with halogen?
A. Rl B. RF C. RBr D. RCl
- (x) When phenol reacts with CH_3COCl the product formed is:
A. Ethanol B. Ethanal C. Ether D. Ester
- (xi) Which of the following can undergo Aldol condensation reaction?
A. Benzaldehyde B. Trimethylacetaldehyde
C. Formaldehyde D. Acetaldehyde
- (xii) IUPAC name of Valeric acid is:
A. Propanoic acid B. Ethanoic acid C. Pentanoic acid D. Butanoic acid
- (xiii) Hydrolysis of nitriles produces:
A. TNT B. Carboxylic acids C. Nitrates D. Nitroalkanes
- (xiv) Most abundant macro molecules on earth are:
A. Carbohydrates B. Olive oils C. Lipids D. Vitamins
- (xv) Which of the following is a trace mineral in human diet?
A. Potassium B. Calcium C. Zinc D. Sodium
- (xvi) Petrochemicals are classified into how many classes?
A. Three B. Four C. One D. Two
- (xvii) Ozone layer is present at a height of about:
A. 80 km above the earth B. 100 km above the earth
C. 5 km above the earth D. 28 km above the earth

For Examiner's use only:

Total Marks:

17

Marks Obtained:



CHEMISTRY HSSC-II

(Revised Syllabus)

27

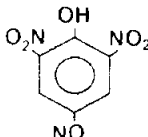
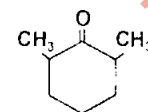
Time allowed: 2:35 Hours

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) *Na*, *Si* and *Cl* are present in the same period of the periodic table but they have different melting points. Why? (3)
- (ii) Salts of Be^{2+} can have four water molecules as water of crystallization. Explain how Be^{2+} is associated with four water molecules. (3)
- (iii) What is Ligand? Give an example of a tridentate and a hexadentate ligand? (1+1+1)
- (iv) How are chromate and dichromate ions interconverted to one another? Write balanced equation to show this interconversion and mention the colour change during this interconversion. (1+1+1)
- (v) State and explain the Morkownikov's rule. (3)
- (vi) What are optical isomers? Draw enantiomers of lactic acid. (1+2)
- (vii) Write the reaction equations for the preparation of following compounds using Methyl magnesium bromide. (1.5+1.5)
- (a) Ter-butyl alcohol
(b) Acetic acid
- (viii) Explain the acidic oxidation of Cumene. (3)
- (ix) Write the equations of reaction of 2,4 – DNP with following compounds: (1.5+1.5)
- (a) Acetaldehyde
(b) Acetone
- (x) What is Fischer esterification? Give an example. Write the name of an ester used as orange flavour
- (xi) Write the names of following compounds: (1+1+1)
- (a)  (b)  (c) $(CH_3)_2C = C(CH_3)_2$
- (xii) How open chain structure of glucose is converted to its cyclic forms? (3)
- (xiii) Define the following: (1+1+1)
- (a) Inhibitors
(b) Lipids
(c) Saponification
- (xiv) Which functional groups are used as chromophore and auxochromes in azo dyes? Give name of two azo dyes. (2+1)
- (xv) Give the composition of following cosmetics: (2+1)
- (a) Nail polish
(b) Nail polish remover
- (xvi) Write the sources and environmental effects of following pollutants: (1+1+1)
- (a) Ozone
(b) PAN
(c) Oxides of Sulphur
- (xvii) What is the role of leather tanneries in water pollution? What health problem can be caused by this pollutant? How can we control this pollutant? (1+1+1)
- (xviii) What is combustion analysis? Give its drawback. (2+1)
- (xix) What is mass spectrometer? How various ions are produced in a mass spectrometer? (1+2)

SECTION – C (Marks 26)

- Note:** Attempt any TWO questions. All questions carry equal marks. (2 x 13 = 26)
- Q. 3**
- a. Discuss the effect of heat on Carbonates and Nitrates of alkaline earth metals. (2+2)
 - b. What are coordination compounds? Give an example of a positively charged complex, a negatively charged complex and a neutral complex along with their IUPAC name. (0.5+4.5)
 - c. How would you prepare Lassaigne's solution? For what purpose is it used? (3+1)
- Q. 4**
- a. Discuss the mechanism of Sulphonation of benzene. (4)
 - b. What is Cannizzoro's reaction? Explain the mechanism of this reaction using a suitable example. (1+4)
 - c. Starting from acetylene how would you prepare the following compounds? (2+2)
 - (i) Acetaldehyde
 - (ii) 1, 1, 2, 2 –tetrabromo ethane
- Q. 5**
- a. How does an enzyme work? Using labelled diagrams explain two mechanisms of enzyme action. (2+4)
 - b. What is a condensation polymer? Explain the formation of Nylon–6, 6 using chemical equation. (1+3)
 - c. What is industrial smog? Write the conditions for development of photochemical smog. (1+2)

— 2HA 1709 (L) —

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Answer Sheet No. _____

Sig. of Candidate. _____

Sig. of Invigilator. _____

23

CHEMISTRY HSSC-II

SECTION – A (Marks 17)

Time allowed: 25 Minutes

(Revised Syllabus)

Version Number

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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) Which of the following alkyne would not produce a Ketone on hydration?
A. 2-Butyne B. Ethyne C. Propyne D. 1-Butyne
- (ii) For which mechanisms the first step involved is the same?
A. E_1 and SN_2 B. E_1 and SN_1 C. E_1 and E_2 D. E_2 and SN_2
- (iii) Green is the characteristic flame colour of:
A. Strontium B. Sodium C. Calcium D. Barium
- (iv) Magnetic moment (μ) of an atom or ion is the measure of its number of unpaired:
A. Neutrons B. Nucleons C. Electrons D. Protons
- (v) When $AgNO_3$ is added to the Lassaign's Solution, which colour is formed for Chlorine?
A. White B. Black C. Yellow D. Blue
- (vi) In which of the following compounds benzene rings are isolated?
A. Phenanthrene B. Diphenylethane C. Naphthalene D. Anthracene
- (vii) It is possible to distinguish between optical isomers by using:
A. IR spectroscopy B. Polarimetry
C. Chemical tests D. Mass spectrometry
- (viii) Reaction of alkylhalides with Na metal yields:
A. Alkenes B. Phenols C. Alkanes D. Alcohols
- (ix) Which one of the following compounds does not contain carboxylic group?
A. Benzoic acid B. Picric acid C. Acetic acid D. Formic acid
- (x) Which one of the following reagents will react with both aldehydes and Ketones?
A. Fehling's reagent B. Benedict's reagent
C. Grignard's reagent D. Tollen's reagent
- (xi) The reaction of Carboxylic acid with an alcohol is called:
A. Ammonolysis B. Esterification C. Saponification D. Hydrolysis
- (xii) Prosthetic groups are:
A. Proteins B. Tightly bound to enzymes
C. Required by all enzymes D. Loosely attached with enzymes
- (xiii) All lipids are:
A. Heterocyclic B. Hydrophilic C. Homocyclic D. Hydrophobic
- (xiv) Polymers which are prepared from more than one kind of monomers are called:
A. Addition polymers B. Linear Polymers
C. Homopolymers D. Copolymers
- (xv) In leather industry which one of the following is used:
A. Aluminium B. Chromium(III) C. Chromium(VI) D. Nickel
- (xvi) Which of the following radiations can vibrate the bonds?
A. Microwaves B. Radio waves C. Ultraviolet D. Infrared
- (xvii) Which of the following is a bidentate ligand?
A. Oxalato B. Ammine C. Fluoro D. Cyano

For Examiner's use only:

Total Marks:

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| 17 |
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Marks Obtained:



CHEMISTRY HSSC-II

(Revised Syllabus)

29

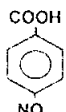
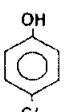
Time allowed: 2:35 Hours

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) Both Carbon and Silicon belong to the same group but the physical properties of their oxides are very different. Why? (3)
- (ii) Write the equations for the reaction of PCl_5 with hot and cold water. (3)
- (iii) Write the names of following compounds: (3)
- (a) $K_2[PtCl_6]$
(b) $[Co(NH_3)_6]Cl_3$
(c) $[PtCl(NO_2)(NH_3)_4]SO_4$
- (iv) What are three possibilities when white light falls on a complex compound? (3)
- (v) How would you perform the test for detection of 'N' in an organic compound by using its Lassaigne's filtrate? What colour is observed if Nitrogen is present? Also write the formula of this coloured compound formed in this test. (1+1+1)
- (vi) Write IUPAC names of following compounds: (3)
- (a)  (b)  (c) $CH_2 = CH - CH_2 - C \equiv CH$
- (vii) Define the following: (3)
- (a) Enantiomers
(b) Resonance
(c) Functional group
- (viii) How would you prepare a primary and a secondary alcohol from Grignard's reagents? (1.5+1.5)
- (ix) Give mechanism of the elimination reaction of ter-butyl bromide in the presence of a strong base. (3)
- (x) Why phenols are more acidic than alcohols? How can you increase or decrease the acidity of phenols? (2+1)
- (xi) Write the mechanism of condensation of ethyl alcohol molecules to form diethyl ether. (3)
- (xii) Draw the structure of following compounds: (3)
- (a) 3-Methyl cyclohexanone
(b) α -Methyl propionaldehyde
(c) Acetophenone
- (xiii) Write a general method of preparation for each of the following compounds: (1.5+1.5)
- (a) Acyl chloride
(b) Acid anhydride
- (xiv) What are polysaccharides? Draw the structure of a Polysaccharide. (1.5+1.5)
- (xv) What is saponification? Write a chemical equation to explain it. (1+2)
- (xvi) Differentiate between: (1.5+1.5)
- (a) Addition polymer and condensation polymer
(b) Thermoplastic polymer and thermosetting polymer
- (xvii) Give any six chemical pollutants present in the photochemical smog. (3)
- (xviii) Draw a labelled diagram to show the apparatus used in combustion analysis. (3)
- (xix) What will be the effect of following radiations on an organic molecule? (3)
- (a) Ultraviolet radiations
(b) Infrared radiations
(c) Microwaves

SECTION – C (Marks 26)

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

- Q. 3**
- a. Give reactions of period 3 elements (from *Na* to *Ar*) with water. (5)
 - b. What is meant by the coordination number of a central metal atom or ion? Describe the geometries (shapes) of the complexes with the coordination numbers 2, 4 and 6. (1+4)
 - c. Explain the followings: (1.5+1.5)
 - (i) Destructive distillation of coal
 - (ii) Homologous series
- Q. 4**
- a. Describe the following reactions with mechanisms: (4+4)
 - (i) Aldol condensation
 - (ii) Friedel-Crafts Acylation
 - b. How will you distinguish between 1-Propanol and 2-Propanol? (2)
 - c. Explain with a suitable example that ozonolysis is helpful to locate the position of double bond in an alkene. (3)
- Q. 5**
- a. Explain the structures of proteins. (4)
 - b. Discuss the sources of raw materials used in chemical industries. (4)
 - c. Explain Green House Effect and discuss its role in Global Warming and give one suggestion to control it. (3+1+1)

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Roll No. Answer Sheet No. Sig. of Candidate. Sig. of Invigilator.

CHEMISTRY HSSC-II


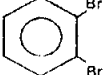
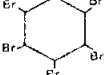

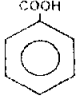
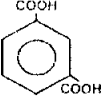
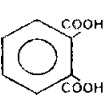
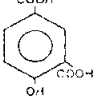
SECTION – A (Marks 17)

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) Which one is the correct order of Hydration Energy of Na^+ , Mg^{++} , Al^{+++} ions?
A. $Na^+ > Al^{+++} > Mg^{++}$ B. $Al^{+++} < Mg^{++} < Na^+$
C. $Na^+ < Mg^{++} > Al^{+++}$ D. $Al^{+++} > Mg^{++} > Na^+$
- (ii) The name of mineral $CaSO_4 \cdot 2H_2O$ is:
A. Gypsum B. Dolomite C. Calcite D. Natron
- (iii) Aluminium does not react with nitric acid at any concentration because of the formation of a layer of:
A. Aluminium Nitrate B. Aluminium Nitrite
C. Aluminium Hydroxide D. Aluminium Oxide
- (iv) Laughing gas is chemically:
A. N_2O B. NO C. NO_2 D. N_2O_5
- (v) Many fluoro compounds like CF_4 and SiF_6 show inertness due to:
A. Small size of Fluorine
B. High ionization energy of Fluorine
C. Restriction of valence shell of Fluorine to octet
D. High electronegativity of Fluorine
- (vi) Which of the following is a non-typical transition element?
A. Cr B. Zn C. Mn D. Fe
- (vii) The type of hybridization of carbon in Ethylene molecule is:
A. Sp B. Sp^2 C. Sp^3 D. dsp^2
- (viii) β, β' -Dichloroethyl Sulphide is commonly known as:
A. Bio-gas B. Laughing gas C. Mustard gas D. Phosgene gas
- (ix) When benzene reacts with Bromine in the presence of $FeBr_3$, the product obtained is:
A.  B.  C.  D. 
- (x) The electrophile in aromatic Sulphonation is:
A. H_2SO_3 B. H_2SO_4 C. SO_3^+ D. SO_3
- (xi) When Ethyl magnesium bromide is reacted with acetone, followed by acid hydrolysis, the product obtained is:
A. 3-Methyl-3-butanol B. 2-Methyl-3-butanol
C. 2-Methyl-2-butanol D. A secondary alcohol
- (xii) Rectified Spirit is converted into absolute alcohol by:
A. Passing through charcoal B. Denaturing with methanol
C. Destructive distillation D. Re-distillation in presence of CaO
- (xiii) Iodoform test is used to distinguish:
A. Ethanol from Acetaldehyde B. 3-Hexanone from 3-pentanone
C. Ethanol from Methanol D. Acetone from Acetaldehyde
- (xiv) Which of the following is the structure of Benzoic acid?
A.  B.  C.  D. 
- (xv) When an alkyl nitrile is hydrolyzed in the presence of an acid or a base, the product obtained is:
A. An Aldehyde B. An Alcohol C. A Ketone D. A Carboxylic acid
- (xvi) Which of the following enzymes brings about the hydrolysis of fats?
A. Urease B. Maltase C. Lipase D. Invertase
- (xvii) Which of the three elements are needed for healthy growth of plants?
A. N, S, P B. N, Ca, P C. N, S, K D. N, P, K

For Examiner's use only:

Total Marks:

17

Marks Obtained:



CHEMISTRY HSSC-II

(Old 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)

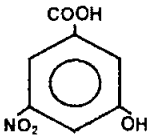
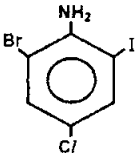
Q. 2 Answer any FOURTEEN parts. The answer to each part should not exceed 5 to 6 lines. (14 x 3 = 42)

- (i) (a) Why the second electron affinity of Group-VI A elements is expressed in positive figures? (1.5)
- (b) Write any three properties of Hydrogen that are similar with Alkali Metals. (1.5)
- (ii) (a) Why Lithium shows different behaviour in Group IA? Give reason. (01)
- (b) What happens when:
- i) Lithium nitrate is decomposed. (01)
- ii) Sodium nitrate is decomposed. (01)
- (iii) (a) Write the composition of Borax. (01)
- (b) What is Borax Bead Test? Explain its Chemistry. (02)
- (iv) (a) What is Aqua Regia? How does it act on Gold? (02)
- (b) How does phosphorus trichloride react with methanol? Write chemical equation. (01)
- (v) (a) Why Hydrogen fluoride is a colourless liquid while Hydrogen Chloride is a colourless gas at room temperature? (01)
- (b) How does Chlorine react with Cold and Hot Sodium Hydroxide? (02)
- (vi) Why most of the compounds of Transition metals are coloured? Explain and write an example. (03)
- (vii) Name the following complex compounds: (03)
- (a) $[Ni(CO)_4]$ (b) $K_4[Fe(CN)_6]$ (c) $K_2[PtCl_6]$
- (viii) (a) Coal is a source of a large number of organic compounds and is called Solid Fuel. How are these compounds extracted from coal? (1.5)
- (b) How is steam cracking carried out? (1.5)
- (ix) Kolbe's Electrolytic Method is used to prepare Ethane from Potassium Acetate. Write its detailed mechanism. (03)
- (x) How will you synthesize the following compounds starting from Acetylene? (03)
- (a) Acetaldehyde (b) Benzene (c) Chloroprene
- (xi) Nitration is a substitution reaction in which NO_2 group is introduced into benzene ring. Write its detailed mechanism. (03)
- (xii) How does Ethyl magnesium bromide react with the following compounds? (03)
- (a) Water (b) Carbon dioxide (c) Acetaldehyde
- (xiii) (a) Ethanol is obtained from Molasses by Fermentation process. Write detailed reactions. (02)
- (b) How is ethanol denatured? (01)
- (xiv) (a) Explain the acidic behaviour of phenol. (02)
- (b) How is picric acid prepared from phenol? (01)
- (xv) (a) Define condensation reaction. (01)
- (b) Differentiate Aldol condensation and Cannizzaro's reaction giving an example of each. (02)
- (xvi) (a) Draw the general structure of an Amino acid. (01)
- (b) How are α -amino acids prepared by Strecker synthesis? (02)

- (xvii) (a) Differentiate Monosaccharides and Oligosaccharides. Write one example from each class. (02)
- (b) What is denaturing of proteins? (01)
- (xviii) (a) Write about the reactions taking place in first 24 hours after mixing cement in water. (02)
- (b) Why is Gypsum added to Clinkers? (01)
- (xix) (a) What is Reducing and Oxidizing Smog? (01)
- (b) What are the necessary conditions for smog formation? (02)

SECTION – C (Marks 26)

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

- Q. 3** a. Sodium metal is prepared on commercial scale by Down's cell. Describe the construction and working of Down's cell with the help of a suitable diagram. (06)
- b. Carbon dioxide is a gas while Silicon dioxide is a solid at room temperature. Give reason. (03)
- c. How is nitric acid prepared by Birkland and Eyde's process? (04)
- Q. 4** a. How can you differentiate between Primary, Secondary and Tertiary alcohols? (04)
- b. Write IUPAC name of the followings: (03)
- i)  ii) $(C_6H_5)_3CH$ iii) 
- c. Compare SN^1 and SN^2 reactions. (06)
- Q. 5** a. Write chemical equation for the followings: (03)
- i) Hydrolysis of Lipids ii) Saponification of Lipids iii) Hardening of oil
- b. Describe the manufacturing process of Urea with the help of flow sheet diagram. (05)
- c. Write note on:
- i) Acid Rain and its effects on environment. (2.5)
- ii) Destruction of Ozone by CFCs. (2.5)

— 2HA 1709 (Old) —