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Answer Sheet No. _____

Sign. of Candidate _____

Sign. of Invigilator _____

CHEMISTRY HSSC-II
SECTION – A (Marks 17)
Time allowed: 25 Minutes

Section – A is compulsory. All parts of this section are to be answered on this page and handed over to the Centre Superintendent. Deleting/overwriting is not allowed. **Do not use lead pencil.**

Q.1 Fill the relevant bubble for each part. Each part carries one mark.

- The first ionization energy is higher for the:

A. Alkali metals	B. Alkaline earth metals
C. Halogens	D. Noble gases
- Crimson red is characteristic flame color of:

A. Li	B. Na
C. Ca	D. Ba
- The catalyst used for synthesis of ammonia by Haber process is:

A. Fe	B. $TiCl_4$
C. Cr_2O_3	D. ZnO
- Aerosols and lotions are used as:

A. Fungicides	B. Repellents
C. Herbicides	D. Miticides
- Due to inert pair effect _____ oxidation state is more stable than for _____ Pb.

A. 2+,4+	B. 1+,4+
C. 4+,2+	D. 2+,3+
- Ozone is destroyed by:

A. SO_2	B. CO_2
C. CFCs	D. HCl
- Which one of the following is used as reference in NMR spectroscopy?

A. Tetra chloromethane	B. Tetra methylsilane
C. Tetra silanemethane	D. Tri iodomethane

8. Which one of the following technique does not involve interaction of electromagnetic radiations with matter?
- A. IR spectroscopy B. NMR spectroscopy
C. Mass spectroscopy D. UV spectroscopy
9. Benzoic acid is obtained by oxidation of:
- A. m-Xylene B. p-Xylene
C. Toluene D. Phenol
10. The structural formula for carboxylic anhydride is:
- A. RCOOCOR B. RCOR
C. RCOOR D. RCOOH
11. Which one of the following is not a nucleophile?
- A. H₂O B. H₂S
C. BF₃ D. NH₃
12. Oxonium ion is formed when:
- A. Ethanol react with Na metal
B. Phenol react with NaOH
C. Ether is treated with HI
D. Ethanol treated with NaOH/I₂
13. Which one of the following reagents reacts with both aldehyde and ketone?
- A. Grignard reagent B. Tollen's reagent
C. Fehling's reagent D. Benedict's reagent
14. Which one of the following reagents is used for reduction of carboxylic acid?
- A. H₂/Ni B. H₂/Pt
C. NaBH₄ D. LiAlH₄
15. Which one of the following is used as major component of soap?
- A. Fatty acid B. Palm oil
C. Proteins D. Saccharides
16. IUPAC name of Glutaric acid is:
- A. Butane dioic acid B. Pentane dioic acid
C. Propane dioic acid D. Hexane dioic acid
17. Which one of the following nuclei is NMR active?
- A. C¹² B. C¹³
C. O¹⁶ D. Ne¹⁰
-



Federal Board HSSC-II Examination
Chemistry Model Question Paper
(Curriculum 2006)

Time allowed: 2:35 hours

Total Marks: 68

Note: Answer all parts from Section 'B' and all questions from Section 'C' on the **E-sheet**.
Write your answers on the allotted/given spaces.

SECTION – B (Marks 42)

Q.2 Attempt all parts from the following. All parts carry equal marks. (14 × 3 = 42)

- i. The thermal stability of carbonates of alkaline earth metals increases down the group. Justify this behavior. (3)

OR

What information is obtained from number of peaks and area under the peaks in NMR spectrum? (1+2)

- ii. Ammonia acts as a ligand and a base. Justify this statement by the reactions with copper ion. (1.5+1.5)

OR

What are ligands? Give example of tridentate and hexadentate ligand. (1+1+1)

- ii. How will you prepare glycerol from hydrolysis and saponification of fats and oils? (1.5+1.5)

OR

What is reducing smog? Write chemical reactions occurring in photochemical smog? (1+2)

- iv. How can nylon-6,6 be prepared from Adipic acid? Give complete chemical reaction. (1+2)

OR

Write reactions of ethanol with following. (1.5 + 1.5)

- a. Ethanoic acid b. $\text{K}_2\text{Cr}_2\text{O}_7/\text{H}_2\text{SO}_4$

- v. How does tetraethyl lead cause air pollution? Give reason. (1+2)

OR

What will be the products formed when ethyl magnesium bromide react with.

- a. CO_2 b. HCHO (1.5+1.5)

- vi. What is the oxidation number and coordination number of the metals in the following complexes? (1.5+1.5)

- (a) $[\text{Cr}(\text{H}_2\text{O})_4(\text{OH})_2]\text{NO}_3$ (b) $\text{K}_4[\text{Fe}(\text{CN})_6]$

OR

Write the chemical reaction of $\text{K}_2\text{Cr}_2\text{O}_7/\text{H}_2\text{SO}_4$ with the FeSO_4 and identify the oxidizing agent. (2+1)

- vii. The order as reducing agent of Halide ions is $\text{F}^- < \text{Cl}^- < \text{Br}^- < \text{I}^-$. Justify the order. (1+1+1)

OR

How modern methods of analysis have an advantage over classical methods of analysis. (3)

viii. What are adhesives? How does hot Glue work? (1+2)

OR

What is redox reaction? Write down a redox reaction of Potassium dichromate with oxalic acid. (1+2)

ix. Summarize the concept of optical Isomerism by drawing different isomeric structures of tartaric acid showing their optical behavior. (1.5+1.5)

OR

How can the following acid derivatives be prepared from carboxylic acid? Write reaction of each. (1+1+1)

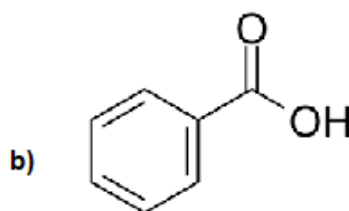
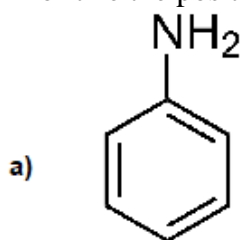
- a. Acid anhydride b. Acyl halide c. Acid amide

x. How will you prepare following compounds starting from acetylene? (1.5+1.5)

- a. Acetaldehyde b. Acetic acid

OR

The following mono substituted benzene are subjected to nitration reaction. Prioritize the positions of different products formed. (1.5+1.5)



xi. Discuss the reactivity order of following carbonyl compounds with reason. Formaldehyde > Acetaldehyde > Butanone (1+1+1)

OR

Identify the product when CH_3MgBr react with ethyl acetate? Give its mechanism. (1+2)

xii. Give stereo chemical evidences of Nucleophilic Substitution reactions of alkyl halides. (1+2)

OR

Give two reactions of benzene which shows that it is an unsaturated compound. (1.5+1.5)

xiii. How can propanoic acid be prepared from ethane? Give reaction. (1+2)

OR

Thiols are considered to be the analogues of alcohols. Compare their acidic nature and oxidation. (1.5+1.5)

xiv. Compare acidity of phenols and carboxylic acid. Support your answer by drawing resonance structures? (1+2)

OR

How Lucas Test being employed to distinguish 1-propanol, 2-propanol and 2-Methyl-2-butanol. Justify your answer by reactions. (1+1+1)

SECTION – C (Marks 26)

Note: Attempt all questions. Marks of each question are given within brackets.

Q.3 Describe the peculiar behavior of 1st member of the alkaline earth metals. Give five main differences from its group elements. (2+5)

OR

What are the possible products formed when formaldehyde reacts with the following reagents? (1+2+2+2)

- i. HCN ii. NaOH iii. AgNO₃/NH₄OH

Q.4 Explain the following: (3+3)

- i. The different routes for the loss of zinc from human body.
ii. Is carbon dioxide responsible for greenhouse effect? If yes then how?

OR

Demonstrate the chemical reactions of [Fe(H₂O)₆]⁺³. With the following (2+2+2)

- i. Sodium hydroxide ii. Sodium Carbonates iii. Ammonia

Q.5 Why transition elements show variation in binding energies. Discuss binding energies of 3d series elements with a graph. (2+2+2)

OR

Define isomerism. Make all possible structural isomers of C₄H₁₀O, classify each giving IUPAC names. (2+2+2)

Q.6 What is beta-elimination reaction? Explain reaction mechanism for the Unimolecular and Bimolecular elimination reactions of R – X. (1+3+3)

OR

Metal oxides are formed by oxidation of metals. How many types of oxides are formed by alkali metals? Also explain reactivity of these oxides with water and acids. (3+4)

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Federal Board HSSC-II Examination
Chemistry Model Question Paper (Curriculum 2006) SLOs

Section A

1. Describe how physical properties like ionization energy changes within a group and period in the periodic table?
2. Perform flame tests and explain the appearance of colors in the flame.
3. Iron as a catalyst in Haber's Process.
4. Pesticides.
5. Inert pair effect and formation of ionic bond.
6. Describe the role of CFCs in destroying ozone in the stratosphere.
7. Describe the standard scales used in proton NMR.
8. Outline the use of MS determination of relative isotopic masses and isotopic abundance.
9. Describe addition reactions of benzene and methyl benzene.
10. Describe reactions of carboxylic acid derivatives.
11. Describe the mechanism and types of nucleophilic substitution reaction.
12. Describe the preparation of phenol from benzene sulphonic acid, chloro benzene and acidic oxidation of Cumene.
13. Describe oxidation reactions of aldehydes and ketones.
14. Describe the chemistry of carboxylic acid.
15. Identify the nutritional and biological importance of lipids.
16. Nomenclature of carboxylic acid.
17. Outline in simple terms the principles of proton NMR spectroscopy.

Section B

Q2:

- i. Discuss the trends in solubility of the hydroxides, sulphates and carbonates of Group II elements.

OR

Explain how chemical environment of proton affects the magnetic field it experiences and hence the absorption of energy at resonance frequency.

- ii. Describe important reactions and uses of copper.

OR

Explain nomenclature of coordination compounds.

- iii. Describe basics of classification and structure-function relationship of lipids.

OR

Recognize various chemical reactions occurring in the atmosphere. (Understanding)

- iv. Describe the formation and uses of Nylon.

OR

Explain reactivity of alcohols.

- v. List possible alternatives to the use of CFCs.

OR

Discuss chemistry of Grignard's reagent by the addition of aldehydes, ketones, esters and carbon dioxide

- vi. Explain nomenclature of coordination compounds.

OR

Describe the mechanism and types of elimination reactions.

vii. Explain the relative behavior of halogens as oxidizing agents and reducing agents.

OR

Compare the classical method of analysis with modern methods.

viii. Describe types and applications of synthetic adhesives.

OR

Describe the reactions of potassium dichromate with oxalic acid and Mohr's salt.

ix. Explain what is meant by a chiral center and show that such a center gives rise to optical isomerism.

OR

Describe the chemistry of carboxylic acids by conversion to carboxylic acid derivatives: acyl halides, acid anhydrides, esters, amides and reactions involving inter-conversion of these.

x. Discuss chemistry of Alkynes by hydrogenation, ozonolysis, hydration etc.

OR

Apply the knowledge of position of substituent in the electrophilic substitution of benzene.

xi. Describe reactivity of aldehydes and ketones and their comparison.

OR

Discuss chemistry of Grignard's reagent by the addition of esters.

xii. Describe the mechanism and types of nucleophilic substitution reactions.

OR

Describe addition reactions of benzene and methyl benzene.

xiii. Describe preparation of carboxylic acids by carbonation of Grignard's Reagent, hydrolysis of nitriles, oxidation of primary alcohols, oxidation of aldehydes and oxidation of alkyl benzenes.

OR

Discuss thiols (RSH).

xiv. Describe preparation of carboxylic acid by carbonation of Grignard's reagent.

OR

Describe reactions of carboxylic acid derivatives.

Section C

Q3: Differentiate beryllium from other members of its group.

OR

Describe acid and base catalyzed addition reactions of aldehydes and ketones.

Q4: i. Identify the sources of minerals such as zinc.

ii. Explain greenhouse effect and global warming as resulting in climate change.

OR

The Chemistry of Some Specific Transition Metals

Q5: Magnetic properties of transition elements.

OR

Define and explain with suitable examples the terms isomerism and structural isomerism.

Q6: Describe the mechanism and types of elimination reactions.

OR

Distinguish between an oxide and a peroxide.

Subject: Chemistry			Paper: Model set-1			Class\Level HSSC-II			Year 23-24			Code		%age
Topics/ Subtopics	s and p block elements	d and f block elements	Organic compoun ds	Hydro carbons	Alkyl halides and amines	Alcoh ol phenyl and ether	Aldehyde and ketones	Carbo xylic acids	Bio chemis try	Industri al chemist ry	Enviro nmen tal chemi stry	Analy tical chemi stry	Total marks for each Assess ment Objecti ve	
Analysis of Questions of syllabus(contents) and assessment objectives														
(Knowle dge based)	3(07)	1iii(01) 2ii(03) 2iiOR(03)	1x(01)			2xiv(0 3) 2xivOR (03)	1xiii(01) 5(06) 3OR(07)	1xiv(0 1)		1iv(01)	1vii(01))	1vii(0 1)	39	26%
(Unders tanding based)	1i(01) 1ii(01) 1v(01) 6OR (07)	2vi(03) 2viOR(03) 2viiiOR (03)		2ix(03) 5OR(06) 2xiiOR(03)	1xi(01) 2xii(03) 6(07) 2xiOR(03)	1xii(01) 2xiiiOR (03)	2xi(03) 2vOR (03) 2ivOR(03)	2ixOR(03) 2xiii(0 3)	1xv(01) 2iii(03)	2iv(03) 2viii(03)	2v(03) 2iiiOR (03)	1viii(0 1) 1xvii(01) 2vii(0 3) 2viiOR (03)	88	57%
(Applica tion based)	2i(03)	4OR(06)		1ix(01) 2x(03) 2xOR(03)				1xvi(0 1)	4i(03)		4ii(03)	2iOR(03)	26	17%
Total marks for each Topic/S ubtopic	20	22	01	19	14	10	23	08	07	07	10	12	153	100%