

BOARD OF INTERMEDIATE AND SECONDARY EDUCATION, PESHAWAR

Higher Secondary School Certificate (H.S.S.C.) Examination — Annual 2023

CHEMISTRY

Class: 12th (Inter Part-II)	Paper ref: PR - XII (01) (23)	Year: 2023	Medium: English
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Time: 20 Minutes

SECTION - A

Marks: 18

Note: Four choices are given against each question; fill the circle of the correct answer only. Use a black or blue ball point / marker to fill the circle. Filling more than one circle for a question will be counted as a wrong answer.

- Grignard's reagent contains _____ metal.
☐ Fe ☐ Ca ☐ Mg ☐ Mn
- The bond angles of H-C-H and H-C-Cl bonds are _____.
☐ Less than 109.5° ☐ Greater than 109.5°
☐ Equal to 109.5° ☐ Equal to 120°
- 1,2,4,5-tetramethylbenzene is the IUPAC name of _____.
☐ Xylene ☐ Toluene ☐ Durene ☐ Mesitylene
- Optical activity of a compound is measured by an instrument called _____.
☐ Photometer ☐ Refractometer
☐ Polarimeter ☐ Calorimeter
- All of the given are alkanes except _____.
☐ C₃H₈ ☐ C₄H₁₀
☐ C₆H₁₂ ☐ C₇H₁₆
- Oxa is the functional group of _____.
☐ Ester ☐ Aldehyde ☐ Ether ☐ Ketone
- Which of the given is not organic in nature?
☐ NH₃-CO-NH₂ ☐ NH₄CNO
☐ CH₃-OH ☐ CH₃Cl
- The most stable oxidation state of manganese in acidic or neutral solution is _____.
☐ +2 ☐ +4 ☐ +6 ☐ +7
- Al₂O₃ is _____.
☐ Acidic oxide ☐ Basic oxide
☐ Neutral oxide ☐ Amphoteric oxide
- Which of the given is NMR inactive nucleus?
☐ ³¹P ☐ ¹H ☐ ¹⁵N ☐ ¹⁶O
- In combustion analysis CO₂ is absorbed by _____.
☐ Mg(ClO₄)₂ ☐ KOH
☐ CuO ☐ CuSO₄
- The height of the stratosphere is from _____.
☐ 1 to 10 km ☐ 10 to 50 km
☐ 50 to 85 km ☐ 85 to 387 km
- Total number of chlorine atoms in DDT are _____.
☐ 3 ☐ 4 ☐ 5 ☐ 6
- Proteins are polymers of _____.
☐ Glucose ☐ Disulphide bridges
☐ Peptide bonds ☐ Amino acids
- All are the derivatives of carboxylic acid except _____.
☐ Acid Halides ☐ Nitrile
☐ Alkyl Halides ☐ Ester
- Gem-Diol is the product of acid/base catalyzed reaction of water with _____.
☐ Aldehyde/ketone ☐ Carboxylic acid
☐ Alcohol ☐ Ether
- In Williamson's synthesis _____ pair of reactants, react with each other to form ether.
☐ R-OH and Na ☐ R-OH and R-Mg-X
☐ R-OH and R-O Na⁺ ☐ R-OH and R-OH
- Lucas reagent is _____.
☐ R-OH and HCl ☐ HCl and ZnCl₂
☐ R-OH and ZnCl₂ ☐ None of these

SECTION - B

Note: Time allowed for Section-B and Section-C is 2 Hours and 40 minutes.

Q2: Answer any TEN parts. Each part carries FOUR marks.

- Write the chemical reactions to show that Al₂O₃ is amphoteric in nature?
- Define electron affinity. Discuss its variation in Halogens?
- Why compounds of Cu⁺ are diamagnetic while Cu²⁺ are paramagnetic?
- What is homologous series? Give the characteristics of homologous series?

5. Enlist four physical properties of cycloalkanes?
6. The reaction of H-Br with H-C≡C-H gives 1,1-dibromoethane while with CH₃-C≡C-H, it gives 2,2-dibromopropane. Give reason.
7. Write the IUPAC names of the following.

(a) C(CH₃)₄

(b) $\begin{array}{c} \text{CH}_3 \quad \text{OH} \\ | \quad | \\ \text{CH}_3 - \text{CH} - \text{CH} - \text{CH}_3 \end{array}$

(c) $(\text{CH}_3)_3\text{C}-\text{CH}_2-\overset{\text{O}}{\underset{||}{\text{C}}}-\text{H}$

(d) HOOC-CH₂-COOH
8. Why secondary amines are more basic than tertiary amines in aqueous solution?
9. Steric hindrance makes the ketones less reactive than aldehydes. Comment over it.
10. Discuss the reactions of phenol with; (a) Bromine (b) Sodium metal
11. What is the effect of substituents on the acidity of carboxylic acids, if attached with carboxylic acid molecule?
12. State the medical problems that may relate to deficiencies of calcium and phosphorus?
13. Give the applications of infrared spectroscopy.

SECTION - C

Note: Attempt any THREE questions. All questions carry equal marks.

- Q3: (a) What is acid rain? Discuss its effects on environment and living organisms?
- (b) Describe four fractions obtained by fractional distillation of petroleum?
- Q4: (a) What are elimination reactions? Discuss E1 mechanism in detail.
- (b) How are aldehydes and ketones reduced to;
- (i) Alkanes by Wolf-Kishner Reduction
 - (ii) Alcohols by Catalytic Method
- Q5: (a) Define stereoisomerism and explain its types?
- (b) How carbon and hydrogen can be detected in organic compounds?
- Q6: Draw the structural formula of the following compounds;
- (i) Naphthalene
 - (ii) Acetic Anhydride
 - (iii) Adipic Acid
 - (iv) 2,4,6-Trinitrotoluene
 - (v) 3,4-dimethylhexan-2-ol
- (b) Differentiate between partial and total synthesis.

Notes on this transcription

- This is a **typeset transcription** of the original paper, not a photograph of it. Question wording, spelling, punctuation and numbering are reproduced exactly as printed, including the board's own errors.
- **No answer key is included.** On the source sheet the correct circles are already shaded in; every option here is reproduced unmarked so the paper can be attempted.
- Peshawar Board papers carry no group label, so this paper is filed without one.
- The objective-section instructions are printed in Urdu on the original sheet; an English rendering of them is given above.
- Structures drawn on the original are redrawn here: benzene rings as ring diagrams with the same substitution pattern, and branched chains in the two-level form the board prints.
- **Q.5, third and fourth options** and **Q.7, first option** sit under the source watermark. They read as C₆H₁₂ and C₇H₁₆, and as NH₃-CO-NH₂ (urea would be NH₂-CO-NH₂); a cleaner scan would confirm all three.
- Board spellings and slips kept verbatim: "Opticla" (Q.4), "Amhoteric oxide" (Q.9), "2,2-dibromopropane" (Section-B 6), and the repeated "(ii)" in the Q6 list, where Adipic Acid should be (iii).
- Neither written section prints per-question mark figures beyond the FOUR marks stated in the Q2 rubric, so the marks column is left empty.