



ROLL NO

**PUNJAB PUBLIC SERVICE COMMISSION**  
**COMBINED COMPETITIVE EXAMINATION**  
**FOR RECRUITMENT TO THE POSTS OF**  
**PROVINCIAL MANAGEMENT SERVICE, ETC -2023**  
**CASE NO. 1C2024**

**SUBJECT: CHEMISTRY (PAPER-II)****TIME ALLOWED: THREE HOURS****MAXIMUM MARKS: 100****NOTE:**

- All the parts (if any) of each Question must be attempted at one place instead of at different places.
- Write Q. No. in the Answer Book in accordance with Q. No. in the Q. Paper.
- No Page/Space be left blank between the answers. All the blank pages of Answer Book must be crossed.
- Extra attempt of any question or any part of the question will not be considered.

**NOTE: Attempt any FIVE Questions in all. Attempt in Urdu or English.**

- Q.No.1** a) Explain the rules of resonance with examples. Discuss the contribution of different canonical forms. **(20 Marks)**
- Q.No.2** a) Describe various types of electronic transition and types of absorption bands which arise as a result of electronic transition in compounds.
- b) Explain the difference between:  
(1) Red shift and blue shift (2) Transmittance and absorbance  
(3) Chromophore and auxochrome (4) Allowed and forbidden transition **(12+8=20 Marks)**
- Q.No.3** a) How will you synthesize ethyl phenyl ketone from each of the following compounds?  
(1) Benzene (2) Benzoyl chloride (3) Benzoic acid  
(4) Benzaldehyde (5) Benzoinitril.
- b) What do you know about condensation reaction? Describe two types of condensation reactions shown by aldehydes. **(10+10=20 Marks)**
- ✓ **Q.No.4** a) How will you prepare following compounds starting from benzene in two step mechanism?  
(1) p-Chloro nitrobenzene (2) m-Chloro nitro benzene (3) Ethyl cyclohexane  
(4) n-Propyl benzene (5) m-Dinitro benzene
- b) Why activating group direct in coming electrophile to ortho and para and deactivating group to meta position. **(10+10=20 Marks)**
- ✓ **Q.No.5** a) What are carbohydrates? Discuss metabolism of carbohydrates.
- b) What are Lipids? How you can classify them. Discuss their importance. **(10+10=20 Marks)**
- ✓ **Q.No.6** a) What is TLC? Explain its mechanism. Discuss its applications.
- b) Compare gas chromatography with liquid chromatography. **(14+6=20 Marks)**
- ✓ **Q.No.7** a) Discuss the application of Dyes.
- b) What are pigments? How they can be manufactured? Give some examples. **(8+12=20 Marks)**
- ✓ **Q.No.8** a) Explain the conformational analysis. On what factors conformational energy depends?
- b) Define optical activity. What are chiral compounds? How chirality is determined by using polarimeter? **(10+10=20 Marks)**