



FEDERAL PUBLIC SERVICE COMMISSION
COMPETITIVE EXAMINATION-2022
FOR RECRUITMENT TO POSTS IN BS-17
UNDER THE FEDERAL GOVERNMENT
CHEMISTRY, PAPER-II

Roll Number

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| TIME ALLOWED: THREE HOURS | PART-I (MCQS) | MAXIMUM MARKS = 20 |
| PART-I(MCQS): MAXIMUM 30 MINUTES | PART-II | MAXIMUM MARKS = 80 |
| <p>NOTE: (i) Part-II is to be attempted on the separate Answer Book.</p> <p>(ii) Attempt ONLY FOUR questions from PART-II. ALL questions carry EQUAL marks.</p> <p>(iii) All the parts (if any) of each Question must be attempted at one place instead of at different places.</p> <p>(iv) Write Q. No. in the Answer Book in accordance with Q. No. in the Q.Paper.</p> <p>(v) No Page/Space be left blank between the answers. All the blank pages of Answer Book must be crossed.</p> <p>(vi) Extra attempt of any question or any part of the question will not be considered.</p> <p>(vii) Use of calculator is allowed.</p> | | |

PART-II

- Q. 2.** Define the following terms and give suitable examples **(20)**
1. Aromaticity
 2. Conjugation
 3. Inductive effect
 4. Irvine-enamine Tautomerism
 5. Intramolecular Hydrogen Bonding
- Q. 2.** Write down Preparations of Alkanes and Aldehydes. Also, give specific examples of addition reactions of alkenes with special reference to Markonikav and anti-Markonikav rule. **(20)**
- Q. 2.** (a) Starting from acetylene how you can prepare 1-Octyne. **(20)**
(b) Write down the condition for the conversion of 2-Octyne to cis 2-Octene
- Q. 2.** Write the structural formula of your choice for all the structural isomers with the molecular formula C₄H₆. Also explain cis, trans, E, Z, and syn, anti geometrical isomerism. **(20)**
- Q. 2.** Phenol is more acidic than methyl alcohol. Explain in detail. Also, draw resonating structures of phenoxide ion. **(20)**
- Q. 2.** (a) Describe the instrumentation of the IR spectrophotometer in detail. **(20)**
(b) What are the Basic Principles of IR Spectroscopy?
- Q. 2.** (a) What is the chemical shift? What are the factors affecting chemical shift? **(20)**
(b) Describe the instrumentation of NMR spectroscopy?
