FEDERAL PUBLIC SERVICE COMMISSION
COMPETITIVE EXAMINATION-2020
FOR RECRUITMENT TO POSTS IN BS-17
UNDER THE FEDERAL GOVERNMENT

Roll Number

CHEMISTRY, PAPER-I

TIME ALLOWED: THREE HOURS PART-I(MCQS): MAXIMUM 30 MINUTES	PART-I (MCQS) PART-II	MAXIMUM MARKS = 20 MAXIMUM MARKS = 80

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

PART-II

Q. 2.   **(a)**   Write two equations of state for real gases and compare them high lighting their important features.   (10)

(b)   **(i)** Explain Heisenberg's uncertainty principle.   (05)
(ii) Discuss Born's interpretation of wave function.   (05)   (10)   **(20)**

Q. 3.   **(a)**   Explain the Kohlrausch law. Why do the real solution should deviate from the law?   (10)

(b)   Compare Langmuir's and Freundlich's adsorption isotherms.   (10)   **(20)**

Q. 4.   **(a)**   Explain the Arrhenius equation. Also high light its applications and limitations.   (10)

(b)   Explain various acid-base theories. What are hard and soft acids and bases?   (10)   **(20)**

Q. 5.   **(a)**   Make a comparison of column chromatography and thin layer chromatography (TLC) by highlighting merits and demerits of the both.   (10)

(b)   Explain Werner's theory of coordination complexes. Give examples from d-block transition metals.   (10)   **(20)**

Q. 6.   **(a)**   Give a comprehensive classification of various chromatographic techniques. Also mention potential application of each.   (10)

(b)   **(i)** What is Hydrogen bonding. Explain.   (05)
(ii) Describe Hybidization in p-block elements.   (05)   (10)   **(20)**

Q. 7.   **(a)**   Explain crystal Field Theory (CFT) for d-block elements.   (10)

(b)   Write an extensive essay on types of chemical bonding giving examples.   (10)   **(20)**

Q. 8.   Write short notes on the following: (5 each)   **(20)**
(i)   Liquid junction potential
(ii)   Potentiometry
(iii)   Collision theory of Chemical reactions.
(iv)   Transition state theory.

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