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

Roll Number

CHEMISTRY, PAPER-I

TIME ALLOWED: THREE HOURS	**PART-I (MCQS) MAXIMUM MARKS = 20**
PART-I(MCQS): MAXIMUM 30 MINUTES	**PART-II 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)** Derive Schrodinger wave equation for particle in one dimensional box. (10)
(b) Discuss Heisenberg's Uncertainty principle. (05)
(c) What is corrosion? How it can be prevented? (05) **(20)**

Q. 3. **(a)** What is Stereoisomerism? Discuss it with reference to coordination complexes. (08)
(b) Define and explain Jahn-Teller theorem. (06)
(c) Write a short note on column chromatography. (06) **(20)**

Q. 4. **(a)** What is Valence Bond theory? How does this theory explains the structure of inorganic molecules? (08)
(b) Define and explain the phenomenon of resonance in inorganic compounds. (06)
(c) Write some general characteristics of actinides. (06) **(20)**

Q. 5. **(a)** What is photoelectric effect? How quantum mechanics explains this effect? (08)
(b) What is wave-function? Discuss its interpretation given by Born. (06)
(c) What are fuel cells? Discuss their working with suitable examples. (06) **(20)**

Q. 6. **(a)** What are electron-deficient compounds? Discuss bond in such compounds. (07)
(b) Define and explain the VSEPR model to explain the geometry of inorganic substances. (07)
(c) Discuss variation in oxidation states of lanthanides. (06) **(20)**

Q. 7. **(a)** What is Nernst equation? Explain it. (08)
(b) Define and explain Kohlrausches's law. (07)
(c) Write a short note on Arrhenius equation. (05) **(20)**

Q. 8. **(a)** What is crystal field theory? How does this theory explain the geometry of complexes? (08)
(b) Explain Lewis theory of acids and bases. (06)
(c) Write a short note on thin layer chromatography. (06) **(20)**

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