



National Officers Academy
Mock Exams for CSS-2022
April 2022 (Final Mock)
CHEMISTRY, PAPER-I

TIME ALLOWED: THREE HOURS PART-I(MCQS): MAXIMUM 30 MINUTES	PART-I (MCQS) PART-II	MAXIMUM MARKS = 20 MAXIMUM MARKS = 80
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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. Write Q. No. in the Answer Book in accordance with Q. No. in the Q. Paper.
- iv. **Use of Calculator is allowed.**

SUBJECTIVE PART — PART-II

Q.2. a) Derive Schrodinger wave equation for particle in 1-D box. (10)

b) What are eigen values and eigen functions? (4)

c) Discuss wave particle duality with suitable expressions. (6)

Q.3. Compare van der Waals equation of pressure and volume correction with ideal gas equation (12)

b) Elaborate the concept of fugacity and activity. (8)

Q.4. a) Apply valence bond theory to explain the formation of Oxygen molecule cation. (12)

b) Predict the shapes of following molecules by the aid of VSEPR theory (8)

HCHO, SbF₃, HgCl₂, NH₂ NH₂

Q.5. a) Discuss crystal field theory in detail (10)

b) Discuss John Teller theorem. (10)

Q.6. a) Derive and discuss Debye Huckel theory for strong electrolytes. How weak electrolytes deviate from Debye Huckel theory (15)

c) Discuss general principle on which fuel cells work. (05)

Best of Luck for CSS-2022