



National Officers Academy
Mock Exams for CSS-2022
January 2022 (Mock-7)
CHEMISTRY, PAPER-II

TIME ALLOWED: THREE HOURS
PART-I(MCQS): MAXIMUM 30 MINUTES

PART-I (MCQS)
PART-II

MAXIMUM MARKS = 20
MAXIMUM MARKS = 80

NOTE:

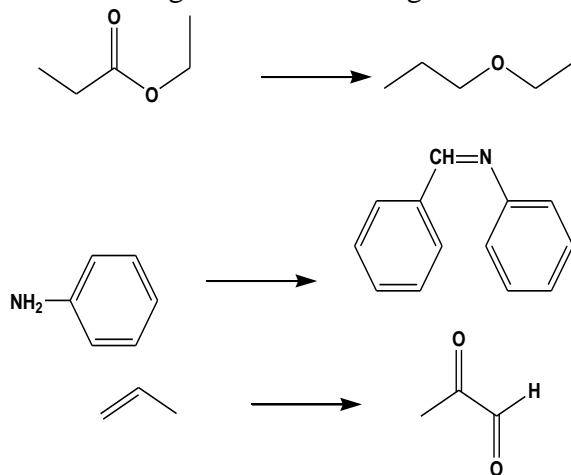
- i. **Part-II** is to be attempted on the separate **Answer Book**.
- ii. Attempt **ONLY FOUR** questions from **PART-II**. **ALL** questions carry **EQUAL** marks.
- iii. Write Q. No. in the Answer Book in accordance with Q. No. in the Q. Paper.
- iv. **Use of Calculator is allowed.**

SUBJECTIVE PART — PART-II

Q. No. 2. Write short notes on the following: (20)

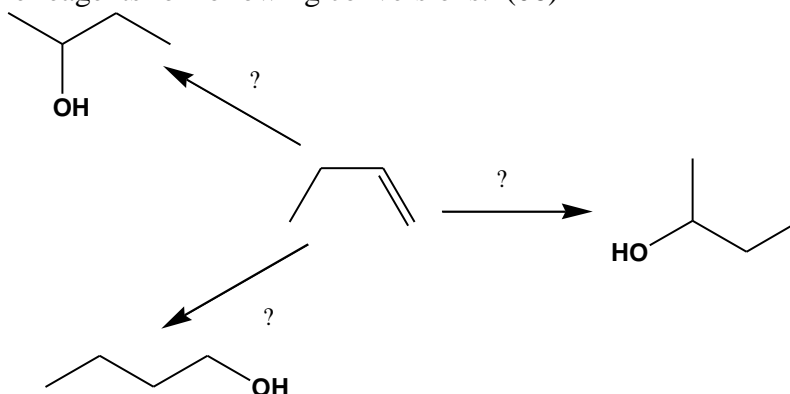
- a) Peptide bond b) Hydrogen bonding c) Hypochromic effect
d) Condensation reactions e) Chemical shift

Q. No. 3. (a) Carry out following conversions using suitable reagents. (12)



(b) What will be the Markonikov's product of reaction of 1-Propene with HBr? Justify with reagent and mechanism. (8)

Q. No. 4. (a) Mention the reagents for following conversions. (06)



(b) Discuss the acidic nature of phenol (04)

(b) Write down esterification mechanism starting with Diazomethane. (10)

Q. No. 5. (a) What are the possible electronic transitions in the following compounds? (10)

Aniline, Benzoic acid, formaldehyde, Ethyl methyl ether, n-Hexane

Which structure is consistent with this ^1H NMR spectrum?

(A) $\text{CH}_3\text{CH}_2\text{OCH}_2\text{CHCl}_2$ (B) $\text{ClCH}_2\text{CH}_2\overset{\text{O}}{\parallel}\text{CCH}_2\text{CH}_3$

(C) $\text{ClCH}_2\text{CH}_2\overset{\text{O}}{\parallel}\text{COCH}_2\text{CH}_3$ (D) $\text{ClCH}_2\text{CH}_2\overset{\text{O}}{\parallel}\text{OCCH}_2\text{CH}_3$

(b)

(10)

- Q. No. 6.** (a) Altogether, the free radical chlorination of (S)-(-)-1-chloro-2-methylbutane gave six fractions of formula $\text{C}_5\text{H}_{10}\text{Cl}_2$. Four fractions were found to be optically active, and two fractions optically inactive. Draw structural formulas for the compounds making up each fraction. Account in detail for optical activity or inactivity in each case. (12)
- (b) Write a brief note on the resolution of racemic mixture. (8)
- Q. No. 7.** (a) Under which conditions $\text{S}_\text{N}2$ is preferred over $\text{S}_\text{N}1$ and $\text{E}2$? (10)
- (b) Addition of Nitro group to aniline leads to Ortho-para or Meta position? (5)
- (c) What is Huckel rule? Discuss its significance. (5)

Best of Luck for CSS-2022