

(FOR THE CANDIDATES ADMITTED

25UCY101

DURING THE ACADEMIC YEAR 2025-26 ONLY)

REG.NO. :

N.G.M. COLLEGE (AUTONOMOUS) : POLLACHI

END-OF-SEMESTER EXAMINATIONS: NOVEMBER 2025

B.Sc. CHEMISTRY

MAXIMUM MARKS: 75

SEMESTER -I

TIME: 3 HOURS

PART - III

INORGANIC AND ORGANIC CHEMISTRY

SECTION – A

(10 X 1 = 10 MARKS)

ANSWER THE FOLLOWING QUESTIONS.

(K1)

1. The trend in atomic size as we move across a period from left to right.
a) Increases b) Decreases c) Remains the same d) First increases and then decreases
2. The bond order of the molecule O₂ is _____
a) 1 b) 2 c) 3 d) 4
3. The role of an electrophile in a chemical reaction _____
a) It donates electrons to form bonds with other species
b) It accepts electrons to form bonds with other species
c) It stabilizes the reaction by providing energy
d) It acts as a catalyst in the reaction
4. The SN₂ reaction is least favourable when the substrate is _____
a) Methyl halide b) Primary alkyl halide c) Secondary alkyl halide d) Tertiary alkyl halide
5. In an electrophilic aromatic substitution reaction, the intermediate formed is _____
a) A free radical b) A carbocation c) A carbanion d) A transition state

ANSWER THE FOLLOWING IN ONE (OR) TWO SENTENCES

(K2)

6. Explain covalent bonding.
7. Indicate the bond order of NO.
8. Define carbanion.
9. Expand SN₁ and SN₂ reaction.
10. Interpret Tropylium cation with structure.

SECTION – B

(5 X 5 = 25 MARKS)

ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS.

(K3)

11. a) Show how the elements are classified into s, p, d, and f blocks.

(OR)

- b) Discover the pseudo inert gas configuration, and how does it affect bonding?

12. a) Explain the hybridization in C_2H_2 .
(OR)
b) Predict the molecular geometry of H_2O using VSEPR theory.
13. a) Describe electrometric effect with an example.
(OR)
b) Sketch the preparation of alkanes.
14. a) Discuss the 1,2 addition of Butadiene.
(OR)
b) Sketch the preparation of Ethyl magnesium iodide.
15. a) Examine the mechanism of nitration in electrophilic substitution reaction.
(OR)
b) Discuss the mechanism of halogenation in electrophilic substitution reaction.

SECTION – C

(5 X 8 = 40 MARKS)

ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS.

(K4 (Or) K5)

16. a) Outline Lewis-Langmuir Concept and Octet Rule with examples.
(OR)
b) Interpret the concept of Hydrogen bonding with applications.
17. a) Explain the role of Solubility Product in qualitative analysis.
(OR)
b) Apply VSEPR theory to $BeCl_2$ and PCl_5 . What is their geometry?
18. a) Construct the mechanism of elimination reactions.
(OR)
b) Discuss the Saytzeff and Hofmann rules.
19. a) Investigate briefly about the Aliphatic Nucleophilic Substitution reaction.
(OR)
b) Discuss the effect of structure of substrate and solvent on Substitution reaction.
20. a) Outline briefly about the Aromatic Electrophilic Substitution reaction.
(OR)
b) Summarize Friedel-Crafts acylation in benzene.
