

Chemistry (Hons.) Semester-1

Paper: CEMA-CC-1-1-TH (Organic Chemistry 1A)

General Treatment of Reaction Mechanism I

Model questions for practice

A. Answer the questions below (write precise and to the point answer):

- Q.1. What is reaction mechanism? [2]
- Q.2. Define ionic mechanism of organic reaction with a suitable example. [2]
- Q.3. What do curved arrows indicate in a reaction mechanism? [2]
- Q.4. Write down the steps/sequence of a radical chain reaction in general. [2]
- Q.5. What is heterogenic bond formation? Give an example. [2]
- Q.6. Define pericyclic reaction. Give an example of an addition reaction that occurs through pericyclic mechanism. [2]
- Q.7. What are nucleophiles? Give example of a neutral nucleophile. [2]
- Q.8. What is α -elimination? Give an example. [2]
- Q.9. How many types of rearrangement reactions are there? Write briefly giving suitable example. [1+2+2]
- Q.10. Define electrofuge with an example. [2]

B. Answer the following multiple choice questions: [10×1= 10]

Q.11. Electrophilic aromatic substitution proceeds through a

- a. free radical b. sigma complex c. carbanion d. carbene

Q.12. The reaction $(\text{CH}_3)_2\text{C}=\text{CH}_2 + \text{Br}^\bullet \longrightarrow (\text{CH}_3)_2\text{C}^\bullet\text{CH}_2\text{Br}$

is an example of which of the following steps of a radical chain reaction?

- a. initiation b. termination c. propagation d. heterolysis

Q.13. In order for a reagent to behave as a nucleophile it must have

- a. a positive charge b. a negative charge c. non-bonding electron pair d. N or S atom

Q.14. What is the hybridization of the C atom in the methyl cation?

- a. sp^3 b. sp^2 c. sp d. not hybridized

Q.15. Which of the following can be considered as an electrophilic reagent?

- a. NH_3 b. Br_2 c. H_2O d. $\text{H}_2\text{C}=\text{CH}_2$

Q.16. Stevens Rearrangement is a type of

- a. nucleophilic rearrangement b. electrophilic rearrangement
- c. radical rearrangement d. pericyclic rearrangement

Q. 17. Which of the following is not an electrophile?

- a. BH_3 b. H^+ c. AlCl_3 d. $\text{H}_2\text{C}=\text{CH}_2$

Q.18. What is the type of the following organic reaction?



- a. Addition b. Elimination c. Rearrangement d. Substitution

Q.19. The 'fish-hook arrow' shows the movement of

- a. a negative charge b. two electrons c. one electron d. no electron

Q. 20. Chlorination of methane proceeds *via* free-radical chain mechanism. Which among the following is the chain-terminating step?

- a. $\text{Cl}_2 \longrightarrow 2\text{Cl}^\bullet$
- b. $\text{CH}_4 + \text{Cl}^\bullet \longrightarrow \bullet\text{CH}_3 + \text{HCl}$
- c. $\bullet\text{CH}_3 + \text{Cl}_2 \longrightarrow \text{CH}_3\text{Cl} + \text{Cl}^\bullet$
- d. $\text{Cl}^\bullet + \text{Cl}^\bullet \longrightarrow \text{Cl}_2$
