

### Question Bank

**Long Essay:**

1	a) Explain the factors affecting $SN_1$ & $SN_2$ reactions. b) Enlight the concept of rearrangement reaction of carbocation with suitable examples
2	a) Define activating and deactivating groups with examples. b) Discuss the mechanism of Nitration and sulphonation of benzene.
3	a) Discuss the mechanism and stereochemistry of $SN_1$ reaction. b) Explain the kinetics and mechanism of $E_1$ reaction.
4	a) Explain the mechanism of halogenation of benzene. b) Halogens are deactivating group but ortho & para director. Give reasons.
5	Explain kinetics, mechanism, stereochemistry and reactivity of $SN_2$ reaction.
6	a) What is electrophilic aromatic substitution reaction. Classify substituent groups with examples. b) Explain the mechanism of Friedel-Craft's alkylation with their limitations.
7	a) Explain the mechanism and stereochemistry of $SN_2$ reaction. b) Describe the mechanism of dehydration of alcohol.
8	a) Explain the mechanism of Friedel-Craft's acylation with suitable example. b) Write the reactivity and orientation of aniline toward electrophilic aromatic substitution reaction.
9	a) Explain the factors affecting $SN_1$ & $SN_2$ reactions. b) Explain the kinetics and mechanism of $E_2$ reaction.
10	a) What is Electrophilic aromatic substitution reaction? Discuss the mechanism of Nitration of benzene. b) Explain the mechanism of Friedel-Craft's alkylation.
11	Discuss the mechanism, stereochemistry and kinetics involved in unimolecular nucleophilic substitution reaction selecting an appropriate example
12	a) Classify the substituent groups based on orientation and reactivity b) Discuss the orientation effect of i) Hydroxyl group in phenol ii) Nitro group in

	Benzene
13	a) Discuss the rearrangement of carbocation with suitable examples. b) Explain kinetics and mechanism of $SN_1$ reaction by selecting an appropriate example.
14	a) Give the general mechanism of electrophilic aromatic substitution reaction with suitable example. b) Explain the reactivity and orientation of activating and deactivating groups with suitable examples.
15	What happens when propene is treated with hydrogen bromide? Discuss the mechanism involved in the presence and absence of peroxide.
16	a) When benzene treated with n-propyl chloride will not give the n-propyl benzene as a major product why? Discuss the mechanism. b) Discuss the orientation effect of i) Methyl group in benzene ii) Amine group in benzene.
17	What are elimination reactions? Discuss the kinetics, mechanism, orientation and reactivity of $E1$ reaction.
18	a) Classify the substituent groups based on orientation and reactivity. b) Discuss the orientation effect of i) Hydroxyl group in benzene ii) Nitro group in Benzene.
19	a) Define and classify carbocation. Add a note on stability of carbocation. b) Differentiate between $SN_1$ & $SN_2$ reactions.
20	What is Electrophilic aromatic substitution reaction? Explain the theory of reactivity and orientation with examples.

**Short Essays:**

1	Discuss the Bayer's strain theory with limitations.
2	Write the kinetics and mechanism of $E_1$ reaction.
3	Explain the mechanism of free radical addition reaction with suitable example.
4	Discuss allyl radical as resonance hybrid with orbital pictures.
5	Explain the mechanism of Benzoin condensation.
6	Why carboxylic acid are acidic in nature? Write the effect of electron withdrawing groups on acidity.
7	Define and classify poly nuclear hydrocarbons. Outline the Howarth's synthesis of naphthalene.
8	Write the kinetics and mechanism of $E_2$ reaction.
9	Define and classify carbenes. Write any two methods of generation of carbenes
10	Discuss the mechanism of 1,2 & 1,4 addition reaction with examples
11	Write the general reaction of nucleophilic addition in aldehydes. Add a note on Grignard reagent.
12	Carboxylic acids are acidic in nature, Why? Chloro acetic acid is more acidic than acetic acid. Give reason.
13	Define with example a) Angle strain b) Huckel's rule c) Poly nuclear hydrocarbons d) Electrophiles e) Nucleophiles.
14	What happens when isobutyl alcohol is treated with sulphuric acid? Discuss the mechanism.
15	What is peroxide effect? Write its mechanism.
16	Discuss allyl cation as resonance hybrid with orbital picture.
17	Outline the mechanism of Perkin's condensation.
18	Explain ionisation of carboxylic acid and write the structure of carboxylate anion.
19	What are cycloalkanes? Write any three methods of preparation.
20	Explain dehydration of alcohol with mechanism.
21	Discuss the stability of conjugated dienes with examples.
22	Explain Cannizzaro condensation with mechanism.
23	Write the conversion of acid to acid chloride, amide and ester.

24	Explain the mechanism of Markovnikov's rule with suitable example.
25	Predict the alkenes obtained from dehydrohalogenation of a) 1-chloro pentane b) 2-chloro pentane c) 2-chloro 2-methyl pentane
26	Explain the mechanism of anti-Markovnikov's addition reaction with suitable example.
27	Outline the synthesis of Anthracene by Haworth's method.
28	Write the mechanism of Claisen condensation
29	Explain the resonance structure and molecular orbital picture of carboxylate anion.
30	Discuss the stability of cycloalkanes.
31	Write the mechanism and orientation of E <sub>1</sub> reaction with suitable example.
32	What happens when propene is treated with hydrogen bromide in presence of peroxide? Discuss the mechanism.
33	Explain the mechanism of Perkin's condensation.
34	Explain the acidity of carboxylic acid and the effect of substituents on acidity.
35	Write the Haworth synthesis of naphthalene.
36	What is Aldol condensation? Discuss the mechanism involved.
37	Discuss the Mechanism and reactivity of Elimination Uni-molecular reaction by selecting an appropriate example.
38	Define and classify attacking reagents with examples.
39	What are Cycloaddition reactions? Explain Diel's alder reaction with mechanism.
40	Why conjugated dienes are more stable than non conjugated dienes explain.
41	Give one method each for the conversion of carboxylic acids into acid chlorides, ester and amide.
42	Explain the factors affecting nucleophilic aliphatic substitution reaction
43	Explain Sack- Mohe theory and molecular orbital concept of cycloalkanes.
44	Write a note on hyper conjugation with suitable examples.
45	Define esterification. Add a note Hatt coupling reaction.
46	Explain esterification reaction with mechanism.
47	Write the difference between S <sub>N</sub> 1 and S <sub>N</sub> 2 reactions.
48	Write any three methods of preparation of cycloalkanes.

**Short Answers:**

1	What is Frie's rearrangement? Write an example
2	Define diazocoupling reaction with example.
3	Write the Hoffmann rearrangement with example.
4	Define and classify carbanion with examples
5	State saytzeff's rule.
6	Write the chlorination of methane.
7	Outline the generation of free radicals.
8	Define metamerism with example.
9	Write the structure and IUPAC name of a)Formic acid b) Neopentane
10	Write the structure of a) Acetanilide b) Acetophenone
11	Write Smith reaction with examples.
12	Outline the Gattermann reaction with example.
13	Write the possible resonance structures of phenoxide ion
14	Define Hofmann's elimination with example.
15	Write the stability of free radicals with example.
16	Define Homolytic bond breaking with example.
17	Why ethanol is higher boiling point than the dimethyl ether?
18	Write the structure and IUPAC name of a) Isopropyl alcohol b) Ethyl acetoacetate
19	Write structure of cis and trans 2-butene.
20	What is Williamson's synthesis? Give an example.
21	Write diazotisation reaction with example.
22	Define and classify nitrenes.
23	Write the stability of carbanion.
24	Write the difference between E1 and E2 reaction.
25	What is free radical substitution reaction? Give an example
26	Classify free radicals with examples.
27	Define functional and positional isomerism with example.
28	Write the structure and IUPAC name of a) Acetic acid b) Formamide
29	Write the structure of a) Aniline b) o-cresol

30	Write the structure of a) 2-bromo 3-methyl hexane b) Methanol
31	Define and classify hydrogen bond with example.
32	Write any one method for formation of free radicals with example.
33	Elimination vs Substitution reactions.
34	What is Crossed Aldol condensation reaction? Give example.
35	Why aliphatic amines are more basic than aromatic amines?
36	What is Sandmeyer's reaction?
37	Write the effects of substitution on acidity of Phenols.
38	Write the structure and IUPAC name of a) Acetone b) Diethyl ether
39	What is Beckmann's rearrangement?
40	Write the conversion of phenol to salicylaldehyde in presence of chloroform & base
41	Arrange the order of basicity of aniline, trimethyl amine & methyl amine. Give reason.
42	What is Knoevengels condensation?
43	Define and classify Carbenes.
44	Write the order of relative reactivity of different halogen with methane
45	Write the stability order of free radicals. Give reason.
46	Define Inductive effect with example.
47	Write the structure and IUPAC name of a) Ethyl methyl ketone b) Diethyl ether
48	Write the structure of a) Ethyl acetate b) Salicylic acid
49	What is Kolbe's reaction?
50	Write the effects of substituents on basicity of aliphatic amines.
51	Define saytzeff's rule.
52	Write the Bromination of methane
53	Outline the stability of free radicals based on bond dissociation energy.
54	Define Geometrical isomerism with example
55	Write the structure and IUPAC name of a) Isobutane b) Dimethyl ketone
56	Write the structure of a) 1,3- butadiene b) 2,4,6-tribromo aniline
57	What are polar Aprotic solvents? Give two examples.
58	Compare the basicity of the following: Methyl amine with Aniline
59	Write the structure and IUPAC name of: a) Ethyl alcohol b) Acetylene

60	Write the structures of: a) 2, 2-Dimethyl propane    b) 3-Chloro pentanone.
61	Write the structure and IUPAC name of a) Acetaldehyde b) Acetone.
62	Write the structure of a) ortho- hydroxy benzoic acid b) 2-methyl cyclopentanone.
63	What is mesomeric effect? Give an example.
64	What is elimination reaction? Give an example.
65	Define carbanion. Write one method of formation of carbanion.
66	Define amines. Give the reason why amines are basic in nature
67	What is Curtius rearrangement?
68	Why phenols are acidic in nature.
69	What are leaving groups? Give example.
70	What is crossed Cannizzaro reaction
71	Give reason, why carbon tetrachloride has a zero dipole moment
72	Write the structure and IUPAC name of: a) Methyl formate    b) Isopropyl alcohol.
73	What is chain reaction of methane?
74	Give the reason why trimethylamine is less basic than dimethyl amine.
75	Write the structures of: a) 3-methyl-2- butanone    b) 2-Hexenal.
76	What is Reimer-Tiemann reaction? Write an example.
77	What is homolytic fission? Give example.
78	What is keto-enol tautomerism? Give example.
79	Write the halogenation of methane.
80	Write the structure and IUPAC name of: a) tert-Butyl chloride b) Formamide.
81	What happens when Grignard reagent reacts with ketone?
82	Write the structures of: a) Methyl salicylate    b) m-Dinitrobenzene