

INSTITUTE OF TEACHING AND RESEARCH IN AYURVEDA

[INSTITUTE OF NATIONAL IMPORTANCE]

MINISTRY OF AYUSH, GOVERNMENT OF INDIA

B. PHARM. (AYU.) I YEAR

PHARMACEUTICAL CHEMISTRY II (ORGANIC CHEMISTRY)

Question Bank

CHAPTER: Nomenclature, Structure and Properties of Organic Compound.

[10marks]

1. Explain different types of orbital with suitable diagram.
2. Explain principal quantum number.
3. What is orbital? Explain different types of orbitals with suitable diagram.
4. Explain Inductive effect and its effects.
5. Explain Electrometric effect
6. What do you mean by orbital? Explain different types of Atomic orbitals with suitable diagram.
7. Write down V. B. Theory.
8. Define orbital? Explain with suitable diagram.
9. What do you mean by dipole moment? Explain its effects.
10. What are H-bonding? Give different types of H-bonding?
11. What is H-bonding? Give its effects.
12. Define elimination reactions with example and narrate its application in pharmacy.
13. Define V.B. theory? Explain with H₂ molecule. Give limitations of V.B. theory.

[5marks]

1. Short note on dipole moment.
2. Short note on V.B. theory.
3. Short note on Inductive effect.
4. Short note on Electrometric effect.
5. Explain Pauling Slater theory
6. Explain Walden inversion.
7. Difference between SN₁ and SN₂.
8. Difference between E₂ and E₁
9. Difference between Pi(π) and sigma(σ)

[2marks]

Draw the structure of given compound.

- 1) Catechol
- 2) Picric acid
- 3) 1,2 dihydroxy ethane

- 4) Maleic acid
- 5) Vinyl chloride
- 6) Triethyl anine
- 7) Benzene sulphuric acid
- 8) 2, 2. 3 triiodo pentanal
- 9) Propanic acid
- 10) Aniline
- 11) 2-Methyl-1- butane nitrile
- 12) Butane
- 13) TNT
- 14) Benzoic acid
- 15) Ethane thiol
- 16) 2- Propanol
- 17) Toluene
- 18) 1,2 butene
- 19) P-hydroxy benzioc acid.
- 20) Methane thiol.
- 21) Butane.
- 22) Pentane.
- 23) Pthalic acid.
- 24) Bromobenzene.
- 25) Phenol.
- 26) Cyclobutane.
- 27) Nitro methane
- 28) Ethylene glycol.
- 29) 1-Hexane.
- 30) Cyclopentane.
- 31) Pyurvic acid.
- 32) Glycerol.
- 33) β -naphthol.
- 34) Succinic acid.
- 35) Resercinol
- 36) Pentene-2, 4-Dione. 2

2. IUPAC names of given organic compound.

- 1) C_2H_5SH
- 2) $HCONH_2$
- 3) $C_2H_5-O-C_2H_5$
- 4) $CH_3-CH_2-CH_2-NH$
- 5) CH_3CH_2COOH
- 6) $CH=CHCOOH$
- 7) CH_3-SO_3H
- 8) $CH_3-CH_2-O-CH_2$
- 9) $NH_2-CH_2-CH-CH_2-CHO$
 $\quad \quad \quad |$
 $\quad \quad \quad CN$

- 10) CH₃-OH
- 11) CH₃- CN
- 12) CH₃-CH₂-CHO
- 13) CH₃-NO₂
- 14) CH₃-CH₂-CO-CH₃
- 15) C₂H₅-SH
- 16) H-CHO
- 17) C₆H₁₂
- 18) CHO



- 19) HCOOCH₃
- 20) CH₃CHCH₂HCO



- 21) CH₂COOH



- 22) CH₃-CH=CHCOCH₂CH₃
- 23) CH₃-CH₂-CH₂-CN

3. Define atomic orbital. (s, p, d orbital)
4. Define Inductive effect
5. Define Electrometric effect.
6. Define dipole moment.
7. Define acid and base.
8. Define principal quantum number.
9. Explain Limitations of V.B.Theory.
10. Define acid and base according to Lewis theory.
11. Define acid and base according to Arrhenius theory.
12. Define acid and base according to Bronsted Lowry theory.
13. Difference between Inductive effects & Electrometric effect.
14. Define Aromatization. i. e. cyclic structure formation.
15. Define trans isomers and cis isomers.
16. Define Organic chemistry
17. Define Bond energies or bond strength.
18. Define Auto-protolysis.
19. Define Oxidation.
20. Define Sulphonation.
21. Define Halogenation.
22. Define Cracking.
23. Define Dehalogenation
24. Define Nitration
25. Define reduction.
26. Define Isomerisation.
27. What is spin quantum number?

28. Difference between Hemolytic and Heterolytic fission.
29. Draw diagram of p and d orbital's.

CHAPTER: Stereochemistry

[10marks]

1. Describe racemic modification.(at least two method of methods)/(preparation)
2. Short note on conformation.
3. Explain stereo selective reaction.
4. Explain stereo specific reaction.
5. Explain E-Z and R-S nomenclature of isomers in detail.
6. What is conformational isomerism? Explain E-Z and R-S nomenclature of isomers in detail
7. Give methods of preparation of racemic mixtures.
8. Narrate stereo specific and stereo selective reaction.

[5marks]

1. Short note on optical activity (optical isomerism)
2. Short note on configurationally isomerism.
3. Short note on conformational isomerism.
4. Short note on centre of symmetry.
5. Short note on geometric isomerism with suitable examples.
6. Explain Cis and Trans isomerism.
7. Describe racemic modification.(at least one methods)/(method of preparation)

[2marks]

1. Define Stereochemistry.
2. Define diastereomers.
3. Define enantiomers.
4. Define optical activity.
5. Define configurational isomerism.
6. Define conformational isomerism.
7. Define symmetric and asymmetric
8. Define stereoselective.
9. Define stereoselective.
10. Define geometric isomerism.
11. Define relative configuration.
12. Define racemization.
13. Define racemic mixture
14. Define stereo specific reactions.
15. Define stereo selective reactions.
16. Define R and S configuration.
17. Define symmetric and asymmetric.

CHAPTER: Thio compounds

[10marks]

1. Give uses and properties thioalcohol.

2. Give uses and properties thioether.
3. Give uses and properties thiophene.
4. Short note on thiophene (preparation and chemical properties /uses)
5. Classify thiocompounds and write note on thioether.
6. Classify thiocompounds and write note on thioalcohol
7. Classify thiocompounds and write note on thiophene.
8. Short note on thioether.
9. Short note on thioephene.
10. Short note on thioalcohol.
11. What is thiophene? Give preparation & properties of it.

[5marks]

1. Short note on thioalcohol. (Preparation and chemical properties /uses)
2. Short note on thioether (preparation and chemical properties /uses)
3. Give 2 preparation of thioether.
4. Give 2 preparation of thioalcohol.
5. Give 2 preparation of thiophene.
6. Give 3 preparation and properties thioether.

[2marks]

1. Define thiocompounds and classify them.
2. Define thioalcohol.
3. Define thioether.
4. Define thiophene.
5. Uses of thioalcohol.
6. Uses of thiophene.
7. Uses of thioether.
8. Give 2 Compounds of Thiocompounds of each class.

CHAPTER: Resonance and Organic Reaction Mechanism.

[10marks]

1. What do you mean by dipole moments? Explain effects of dipole moments on organic compounds.
2. What is organic reaction mechanism? Explain bond fission.
3. What will be the effect of resonance on acidify and basify of compound.
4. Define resonance, types of resonance & resonance energy, what will be the effect of resonance on acidify and basify of compound.
5. Explain hydrogen bonding with its effects.
6. Write about resonance, type of resonance, resonance energy.
7. How bond breaking takes place in organic additional reaction? Explain with suitable examples.
8. Effect of resonance.
9. Define nucleophilic substitution reaction. Explain SN2 reaction mechanism in detail.
10. Define elimination reaction. Explain E1 reaction mechanism in detail.

11. Define elimination reaction. Explain E2 reaction mechanism in detail.
12. Enlist various effects of resonance. Explain bond length.
13. Explain Following Terms
 1. Heterolysis
 2. Homolysis
 3. Dipole-Dipole interaction
 4. Antibonding orbital
14. Discuss mechanism of SN1 and SN2 reactions of alkyl halides.
15. Short note on heterolysis or heterolytic fission.

[5marks]

1. Short note on carbanion ion.
2. Short note on SN1 reaction.
3. Short note on carbonium ion.
4. Short note on SN2 reaction.
5. Short note on E1 reaction.
6. Short note on E2 reaction.
7. Short note on nucleophile.
8. Short note on electrophile.
9. Short note on homolysis or hemolytic fission.
10. Short note on free radical.
11. Short note on hydrogen bonding.
12. Explain Conditions necessary for resonance.
13. Explain Characteristic of resonance.
14. Explain 3 step of free radical reaction.

[2marks]

1. Define organic reaction mechanism.
2. Define heterolysis or heterolytic fission.
3. Define homolysis or hemolytic fission.
4. Difference between heterolytic & hetrolytic fission.
5. Define carbonium ion or cation.
6. Define carbanion ion or anion.
7. Define elimination reaction with example.
8. Define addition reaction with example.
9. Define rearrangement reaction with example.
10. Define substitution reaction with example.
11. Explain Friedel – Crafts Acylation reaction.
12. Define electrophile.
13. Define nucleophile.
14. Define free radical.
15. Define resonance.
16. Define resonance energy.
17. Define SN reaction.
18. Draw energy profile diagram of SN2 reaction mechanism.

19. Draw energy profile diagram of SN1 reaction mechanism.

CHAPTER: Brief introductions of important aliphatic and aromatic compounds.

[10marks]

1. Define alkanes? Give 3 methods of preparation, physical, chemical properties and uses of alkanes.
2. What is aromatic acid? Give preparation of it.
3. What is aromatic hydrocarbon? Give its preparation method.
4. Gives 2 examples. Define alkenes? give 2 methods of preparation, properties of alkenes
5. Define alkynes? Give 2 methods of preparation, properties and uses of alkynes.
6. Give Preparation, properties and uses of aromatic acid.
7. Give Preparation, properties and uses of aliphatic acid.
8. Preparation, properties and uses of aldehyde.
9. Preparation, properties and uses of ketone
10. Short note on Pyrolysis.
11. What are phenols? How they differ from alcohols? Write a note on Reimer-Tiemann reaction.
12. Write various reactions involved in oxidation and reduction of aldehydes and ketones.

[5marks]

1. Give properties and uses of alkyne.
2. Give properties and uses of alkenes.
3. Define alcohol. Give its method of preparation.
4. Define Carboxylic acid. Give its uses.
5. Define ketones. Gives its preparation and uses.
6. How will you distinguish between primary, secondary and tertiary alcohol.

[2marks]

1. Define alkane.
2. Why alkene is known as olefine?
3. Give 2 compounds of alkane.
4. Give 2 compounds of alkyne.
5. Give 2 compounds of alkene.
6. Give uses of alkane
7. Give uses of alkene
8. Give uses of alkyne.
9. Give properties of alkane.
10. Give properties and uses of alkane.
11. Give properties and uses of alkene.

CHAPTER : Nucleophilic aromatic substitution reaction

[5 / 10marks]

1. Explain benzyne mechanism.
Or Explain benzyne in short
2. What is aromaticity? Enlist the aromatic Nucleophilic substitution reaction with example.
3. Explain Nucleophilic substitution reaction? Explain any one mechanism.
4. Explain one mechanism of Nucleophilic aromatic substitution reaction.
5. What is aromatic Nucleophilic substitution reaction? Explain benzyne mechanism as types of reaction.
6. Define α - β unsaturated carbonyl compounds. Explain methods preparation.
7. Explain following terms.
 1. Electrophilic addition
 2. Nucleophilic addition
 3. Michael addition
 4. Diels alder reaction
8. What is conjugated system? Explain the Michael addition reaction.

[2marks]

1. Define aromatic compounds.
2. Test for aromatic & aliphatic compounds.
3. Write down examples of α - β unsaturated carbonyl compounds.
4. Define α - β unsaturated carbonyl compounds.
5. Give structure of cetonaldehde and cinnamaldehyde