B.Pharm Even Semester Examination, May, 2025

PHARMACEUTICAL SCIENCES

(2nd Semester)

Course No: BP-202T

(Pharmaceutical Organic Chemistry-I)

FM: 75

Time: 3 Hours

The figures in the right margin indicate full marks for the question

I. A Multiple choice questions. 1x10=10

1. Which of the following will increase the acidity of a carboxylic acid?

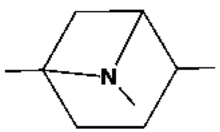
   (a) Electron-donating groups

   (b) Alkyl groups

   (c) Electron-withdrawing groups

   (d) Hydrocarbon chains

2. The correct IUPAC name of the following molecule is



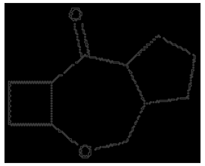
   (a) 1,4,6-trimethyl-7-azabicyclo[3.1.1]heptane

   (b) 1,4,6-trimethyl-6-azabicyclo[3.1.1]heptane

   (c) 1,3,6-trimethyl-4-azabicyclo[3.1.1]heptane

   (d) 1,2,6-trimethyl-5-azabicyclo[3.1.1]heptane

3. The correct IUPAC name of the following molecule is



(a) 7 oxatricyclo[7.3.0.0^{3,6}]dodecan 2 one

(b) 2 oxatricyclo[7.3.0.0^{1,10}]dodecan 9 one

(c) 9 oxatricyclo[7.3.0.0^{3,7}]dodecan 2 one

(d) 8 oxatricyclo[7.3.0.0^{4,7}]dodecan 2 one

4. The Clemmensen reduction is a reaction used in organic chemistry to convert carbonyl functionalities into

(a) Alcoholic group (b) Oxime group

(c) Methylene group (d) Methyl group

5. Alicyclic compounds are:

(a) Linear and saturated

(b) Cyclic and aromatic

(c) Cyclic but aliphatic

(d) Aromatic and acyclic

6. In the Diels–Alder reaction, conjugated dienes react with:

(a) Nucleophiles (b) Alkenes

(c) Electrophile (d) Radicals

3. Classify structural isomerism in organic compounds with examples (give structure) under each class. 5

4. Give the structure and a use of amphetamine and formaldehyde. 2.5+2.5=5

5. Write down the detail mechanism of ozonolysis reaction of an alkene. 5

6. Explain the basicity and effect of substituents on basicity of aliphatic amines. 5

7. How primary and secondary amines reacts with carbonyl compounds? Provide possible mechanism. 5

8. Explain the qualitative tests for carboxylic acids and amide. 5

9. Explain the 1,2 and 1,4 addition reactions of conjugated dienes. 5

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I. B Objective type (Answer the following in brief) 2x5=10

1. Give the structure and a use of Iodoform.

2. What do you mean by the term Markownikoff's orientation?

3. Give the structure and a use of ethylenediamine.

4. What is phase transfer catalyst? Give an structural example.

5. Write down two general method of preparation for alcohols.

II Long answers (Answer two out of three questions) 10x2=20

1. Discuss the rules laid down for the nomenclature of bicyclic and tricyclic molecules with specific examples under each rule. 5+5=10

2. Write down two methods of preparation of alkyl halide. Explain the kinetics and stereochemistry of SN^{1} versus SN^{2} reactions with proper mechanism. 4+6=10

3. Define and discuss the mechanism of Cannizzaro reaction and benzoin condensation reaction. 5+5=10

III. Short answers (Answer seven out of nine questions) 5x7=35

1. Explain the acidity and effect of substituent on acidity of monocarboxylic acid. 5

2. Discuss Tollens' test and Fehling's test with appropriate reactions. 2.5+2.5=5.

7. Which of the following substrates is most likely to undergo an SN1 reaction

   (a) Methyl chloride (b) 1° alkyl bromide

   (c) 3° alkyl bromide (d) Vinyl chloride

8. The electromeric effect is observed when:

   (a) A nucleophile donates a pair of electrons to a carbon atom

   (b) A covalent bond breaks heterolytically

   (c) A molecule undergoes temporary polarization in the presence of an attacking reagent

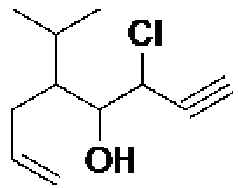
   (d) A molecule rotates around a single bond

9. Which reagent is used to distinguish between primary, secondary, and tertiary alcohols?

   (a) Tollen's reagent (b) Fehling's solution

   (c) Lucas reagent (d) Brady's reagent

10. The correct IUPAC name of the following molecule is



   (a) 6-chloro-4-isopropyloct-1-en-7-yn-5-ol

   (b) 3-chloro-5-isopropyloct-7-en-1-yn-4-ol

   (c) 5-chloro-2-methylhept-7-allyl-6-yn-4-ol

   (d) 3-chloro-3-isopropyloct-7-en-1-yn-5-ol