2. Explain the kinetics and stereochemistry of SN1 versus SN2 reactions with proper mechanism. Discuss briefly three factors affecting SN1 and SN2 reactions? (2+5)+3=10
3. Define and discuss the mechanism of aldol condensation and benzoin condensation reaction. 5+5=10

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

1. Explain the basicity and effect of substituent on basicity of aliphatic amines. 5
2. Classify of organic compounds with structural example under each class. 5
3. Write down two methods of preparation of alkanes and alkenes. 2.5+2.5=5
4. Classify Structural isomerism in organic compounds with examples (give structure) under each class. 5
5. Discuss Tollens' test and Fehling's test with appropriate reactions. 2.5+2.5=5
6. Give the structure and a use of oxalic acid and iodoform. 2.5+2.5=5
7. Write down the detail mechanism of ozonolysis reaction of an alkene. 5
8. Explain the acidity and effect of substituents on acidity of carboxylic acids. 5
9. How can you differentiate primary, secondary and tertiary amines (give proper reactions)? What do you mean by the term electrophilic addition? 4+1=5

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UG (CBCS) EVEN SEMESTER EXAM, JULY 2024

PHARMACEUTICAL SCIENCES

(2nd Semester)

Course No: BP - 202T

(Pharmaceutical Organic Chemistry-I – Theory)

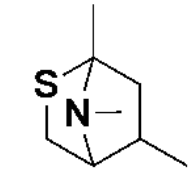
Full Marks : 75

Time : 3 hours

The figures in the margin indicate full marks for the questions

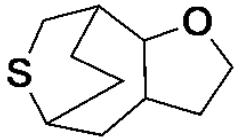
I. A. Multiple choice questions 1×10=10

1. The correct IUPAC name of the following molecule is



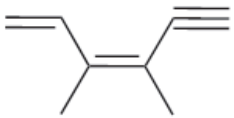
(a) 4,6,7-trimethyl-3-thia-7-azabicyclo[2.2.1]heptane
(b) 1,5,7-trimethyl-2-thia-7-azabicyclo[2.2.1]heptane
(c) 1,3,7-trimethyl-6-thia-7-azabicyclo[2.2.1]heptane
(d) 2,4,7-trimethyl-5-thia-7-azabicyclo[2.2.1]heptane

2. The correct IUPAC name of the following molecule is



(a) 9-oxa-3-thia-tricyclo[6.2.2.06,10]dodecane
(b) 6-oxa-2-thia-tricyclo[6.2.2.01,7]dodecane
(c) 3-oxa-9-thia-tricyclo[6.2.2.02,6]dodecane
(d) 2-oxa-8-thia-tricyclo[6.2.2.01,5]dodecane

3. The Wolff-Kishner 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
4. The correct IUPAC name of the following molecule is



   (a) 1,2-dimethylbuta-1-vinyl-en-4-yne
   (b) 3,4-dimethylhexa-3,5-dien-1-yne
   (c) 3,4-dimethylhexa-2,3-dien-3-yne
   (d) 3,4-dimethylhexa-1,3-dien-5-yne
5. Select the incorrect statement regarding alkanes
   (a) It is otherwise known as paraffin
   (b) It is an acyclic saturated hydrocarbon
   (c) In alkanes, C-C bonds are single
   (d) Alkanes have the general formula CnH2n
6. Choose the incorrect statement with respect to the nomenclature of tricyclic compounds
   (a) The main ring and the primary bridge forms a bicyclic system
   (b) The main ring should contain as many carbon atoms as possible
   (c) The main ring shall be divided as asymmetrically as possible by the main bridge.
   (d) The superscript locating the secondary bridge should be as small as possible
7. In heterocyclic compounds, if the heteroatoms are different then the order of citation is
   (a) O>N>S>Si>P

   (b) O>S>N>Si>P
   (c) O>S>N>P>Si
   (d) O>N>Si>S>P
8. The formulation of Lucas reagent consists of
   (a) Conc. HCl and anhydrous $ZnCl_2$
   (b) Conc. HCl and anhydrous $CaCl_2$
   (c) Conc. HNO3 and anhydrous $ZnCl_2$
   (d) Conc. HNO3 and anhydrous $CaCl_2$
9. Which of the following halide can give best SN2 reaction?
   (a) Primary alkyl halide
   (b) Secondary alkyl halide
   (c) Tertiary alkyl halide
   (d) All can give SN2 reaction at same rate
10. Heating a mixture of calcium salt of formic acid and calcium salt of acetic acid yield
   (a) Propanal
   (b) Ethanal
   (c) Acetone
   (d) Butanal

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

1. Give the structure and a use of cetosteryl alcohol.
2. What do you mean by the term inductive effect?
3. Define electromeric effect and what are its types.
4. What is Markownikoff's orientation?
5. Write down two general method of preparation for carbonyl compounds.

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

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