

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

1. Discuss the synthesis, reactions and medicinal applications of indole. 3+5+2=10
2. Discuss in details the methods of determination of configuration of optical (R/S) and geometrical isomers (E/Z) as per CIP rules. 5+5=10
3. Write down the mechanism and synthetic application of metal hydride reduction and Oppenauer-oxidation. 5+5=10

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

1. What are the different types of reactions given by chiral molecules. Give appropriate examples. 5
2. Discuss the relative aromaticity of pyrrole, furan and thiophene. 5
3. Discuss the conformational isomerism in n-butane and cyclohexane with proper diagram. 2.5+2.5=5
4. Mention synthesis and medicinal uses of azepines. 2.5+2.5
5. Write down the mechanism and application of Beckmanns rearrangement reaction. 4+1=5
6. Describe the synthesis and reactions, and medicinal uses of imidazole. 2+1+2
7. What do you mean by resolution of racemic mixture? Give an example with specific reaction. 2+3=5
8. Describe Ullman synthesis, Bernthsen synthesis, Skraup synthesis and Friedlander synthesis. 2+1+1+1=5
9. Write down the mechanism and a synthetic application of Dakin reaction. 4+1=5

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**B Pharm Even Semester Examination,  
September, 2023**

**PHARMACEUTICAL SCIENCES**

**(4th Semester)**

**Course No: BP-401T**

(Pharmaceutical Organic Chemistry-III- Theory)

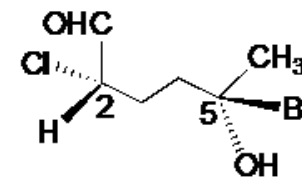
FM: 75

Time: 3 Hours

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

**I. A. Multiple Choice questions 1x10=10**

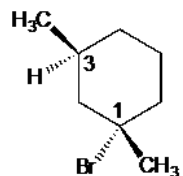
1. Isoquinolines can be synthesized using
  - (a) Bernthsen reaction
  - (b) Feist Benary synthesis
  - (c) Pomeranz-Fritsch reaction
  - (d) Traube's synthesis
2. Identify the correct R/S notation for the following molecule at the chiral centres at position **2** and **5**.



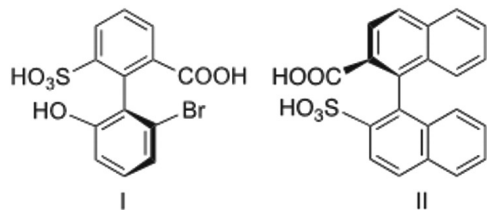
- |            |            |
|------------|------------|
| (a) 2R, 5S | (b) 2S, 5S |
| (c) 2S, 5R | (d) 2R, 5R |

Turn Over

3. Oxazole nucleus is present in  
 (a) Texaline (b) Caffeine  
 (c) Metronidazole (d) Sulfamerazine
4. Identify the correct R/S notation for the following molecule at the chiral centres at position **1** and **3**.



- (a) 1R,3S (b) 1S,3R  
 (c) 1S,3S (d) 1R,3R
5. The starting material used in Madelung synthesis is  
 (a) Acetamide (b)  $\beta$ -keto ester  
 (c) Benzaldehyde (d) o-tolylformamide
6. The absolute configuration of the following atropisomers (**Structure I and Structure II**) is



- (a) IS; IIS (b) IS; IIR  
 (c) IR; 2R (d) IR; IIS
7. Dehydration of succinaldehyde in presence of phosphorous pentoxide gives  
 (a) Pyridine (b) Furan  
 (c) Oxazole (d) Imidazole

8. The reaction between an aldehyde or ketone having an  $\alpha$ -hydrogen with an aromatic carbonyl compound lacking an  $\alpha$ -hydrogen is known as  
 (a) Birch reduction  
 (b) Schmidt rearrangement  
 (c) Claisen-Schmidt condensation  
 (d) Wolff Kishner reduction.
9. Which of the following nucleus is present in vincristine?  
 (a) Pyrimidine (b) Quinoline  
 (c) Purine (d) Indole
10. The selective stabilities of the four conformations of cyclohexane decrease in the order:  
 (a) Halfchair > boat > twisted boat > chair  
 (b) Chair > twisted boat > boat > half chair  
 (c) Boat > twisted boat > Chair > half chair  
 (d) Twisted boat > chair > half chair > boat

**I. B. Objective type** **2x5=10**

- Write any one method each to synthesize furan and thiophene.
- What is the difference between stereospecific and stereoselective reactions?
- Mention two reactions of pyrazole.
- Mention two conditions for optical activity of atropisomers.
- Define mesomerism with an example.