



UNIVERSITY OF THE PUNJAB
B.S. 4 Years Program : Fifth Semester – 2020

Paper: Organic Chemistry

Course Code:CHEM-305

Part – I (Compulsory)

Time: 15Min. Marks: 10

Roll No. in Fig.

Roll No. in Words.

Attempt this Paper on this Question Sheet only.

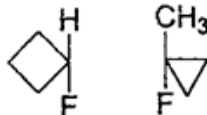
Division of marks is given in front of each question.

This Paper will be collected back after expiry of time limit mentioned above.

Signature of Supdt.:

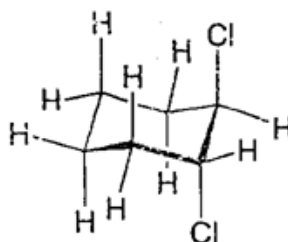
Q.1. Encircle the right answer cutting and overwriting is not allowed. (10x1=10)

1. The molecules shown are



- a) Constitutional isomers
- b) Enantiomers
- c) Diastereomers
- d) Identical

2. What is the correct name for

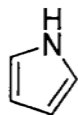


- a) Cis-1,2-cyclohexane
- b) Trans-1,2-cyclohexane
- c) Trans-1,3-cyclohexane
- d) Cis-1,3-cyclohexane

3. Which of the following is more stable



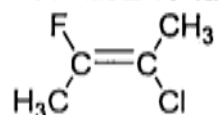
- a) A
- b) B
- c) Both A and B
- d) None of these



4. is the molecule known as pyrrole. It is an aromatic compound that is quite stable. Which of the following factors is responsible for its stability?

- a) Resonance
- b) Hyperconjugation
- c) Hydrogen bonding
- d) Inductive effect

5. Assign *E* or *Z* notation to the following compound;



- a) *E* b) *Z*
c) *R* d) None

6. Which of them is optically inactive;

- a) Alkynes b) *ortho* substituted biphenyls
c) Spiranes d) Allenes

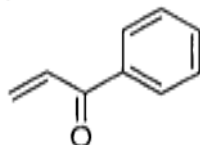
7. Which ester will **not** give a good yield of the Claisen condensation product with NaOEt in EtOH?



8. Which of the following pairs does **not** show an acid and its conjugate base?

- a) $\text{H}_3\text{N}^+\text{CH}_2\text{CO}_2\text{H}$ and $\text{H}_3\text{N}^+\text{CH}_2\text{CO}_2^-$
b) $\text{H}_3\text{N}^+\text{CH}_2\text{CO}_2^-$ and $\text{H}_2\text{NCH}_2\text{CO}_2$
c) $\text{H}_2\text{NCH}_2\text{CO}_2\text{H}$ and $\text{H}_3\text{N}^+\text{CH}_2\text{CO}_2^-$
d) $\text{H}_2\text{NCH}_2\text{CO}_2\text{H}$ and $\text{H}_2\text{NCH}_2\text{CO}_2^-$

9. Which combination of carbonyl compounds give phenyl vinyl ketone by an aldol condensation;



- a) Acetophenone & Aldehyde
b) Benzaldehyde & aldehyde
c) Acetophenone & Ketone
d) Benzaldehyde & ketone

10. Which is the most basic of the following compounds;

- a) Aniline b) *m*-nitroaniline
c) *p*-nitroaniline d) *o*-nitroaniline

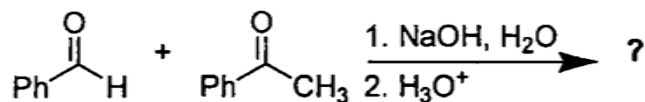


ATTEMPT THIS (SUBJECTIVE) ON THE SEPARATE ANSWER SHEET PROVIDED

Q.2. Give short answers of the following:

(5x4=20)

1. Write down the product and mechanism of the following reaction?



2. Compare the acid and basic strengths of following and give reasons:

i. amides and alkyl amines

ii. benzoic acid and cyclohexanoic acid?

3. Why the overall ring strain is minimum in cyclohexane, although the angle strain is minimum in cyclopentane?

4. Explain conformational analysis of 2,3-Dimethylbutane.

5. Describe the mechanism of Stobe's Condensation

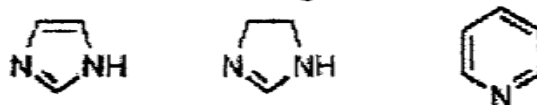
Q.3. Give brief answers of the followings.

(3x10=30)

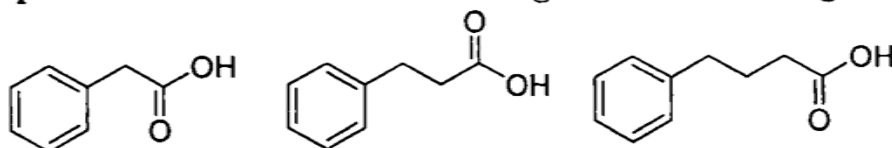
a) Draw the conformational energy diagram of butane for a complete rotation of 360° about C-C bond. (6)

b) What is Walden Inversion? Explain with examples (6)

c) i) Compare with reason the basic strength of the following compounds. (6)



ii) Compare with reason the acidic strength of the following acids. (2)



d) Give detailed mechanism, conditions and synthetic applications of Aldol condensation and Wittig reaction. (10)