

PARUL UNIVERSITY
FACULTY OF PHARMACY
B. Pharm. Summer 2022-23 Examination

Semester: 4

Subject Code: BP401T

Subject Name: Pharmaceutical Organic Chemistry-III

Date: 10/04/2023

Time: 10:00am to 1:00pm

Total Marks: 75

Instructions:

1. Figures to the right indicate maximum marks.
2. Make suitable assumptions wherever necessary.

Q.1 Multiple Choice Questions (MCQs) (1 Mark Each)**(20)**

1. If a compound has two chiral carbon. What is the number of optically active isomers?

| | |
|----------|----------|
| a) Three | b) Four |
| c) Five | d) Eight |
2. The compound which rotates plane-polarized light in an anticlockwise direction is denoted with the prefix_

| | |
|-------------|-------------|
| a) D | b) L |
| c) <i>d</i> | d) <i>l</i> |
3. According to CIP selection rules, the decreasing order of preference is

| | |
|---|---|
| a) $-\text{NH}_2 > -\text{C}_6\text{H}_5 > -\text{CH}(\text{CH}_3)_2 > -\text{H}$ | b) $-\text{CH}(\text{CH}_3)_2 > -\text{C}_6\text{H}_5 > -\text{H} > -\text{NH}_2$ |
| c) $-\text{NH}_2 > -\text{CH}(\text{CH}_3)_2 > -\text{C}_6\text{H}_5 > -\text{H}$ | d) $-\text{C}_6\text{H}_5 > -\text{CH}(\text{CH}_3)_2 > -\text{NH}_2 > -\text{H}$ |
4. Racemic mixtures are formed by mixing two:

| | |
|----------------------|--------------------|
| a) Isomeric compound | b) Chiral compound |
| c) Meso compounds | d) Enantiomers |
5. The isomers which can be inter converted through rotation around a single bond are

| | |
|----------------|----------------------|
| a) conformers | b) diastereomers |
| c) enantiomers | d) positional isomer |
6. Number of conformers observed in ethane _____

| | |
|------|------|
| a) 6 | b) 4 |
| c) 3 | d) 2 |
7. The compound that would show optical isomerism is _____

| | |
|---|---|
| a) $\text{H}_2\text{N}-\text{CH}(\text{CH}_3)_2$ | b) $(\text{CH}_3)_2\text{CHCHO}$ |
| c) $\text{CH}_3-\text{CH}(\text{OH})-\text{COOH}$ | d) $\text{H}_2\text{N}-\text{CH}_2-\text{COOH}$ |
8. A reaction in which only one stereoisomer is formed exclusively is called _____

| | |
|--------------------|-------------------|
| a) Stereoselective | b) Stereospecific |
| c) Regioselective | d) Regiospecific |
9. Reduction of thiophene using H_2/Pd gives _____

| | |
|------------------------|---------------------|
| a) Butane | b) Dihydrothiophene |
| c) Tetrahydrothiophene | d) None |
10. The electrophilic aromatic substitution reaction of furan takes place at _____

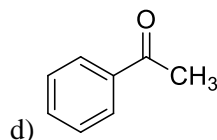
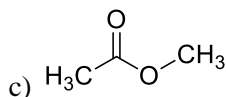
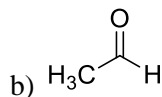
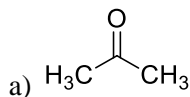
| | |
|-----------------|-----------------|
| a) 1st position | b) 2nd position |
| c) 3rd position | d) 4th position |
11. Which of the following heterocycle shows hydrogen bonding?

| | |
|--------------|--------------|
| a) Pyrrole | b) Furan |
| c) Thiophene | d) Quinoline |
12. Five-membered rings come under which category of heterocycle classification based on chemical behavior?

| | |
|------------------------------------|--|
| a) Electron excessive heterocycle | b) Electron-deficient heterocycle |
| c) Electron equivalent heterocycle | d) Can't say about the five-membered rings |
13. Which of the following heterocycle can be synthesized using Pomeranz-Fritsch synthesis?

| | |
|-----------------|---------------|
| a) Pyridine | b) Pyrimidine |
| c) Isoquinoline | d) Purine |

14. Rabprazole consist of _____ Heterocycle
- a) Imidazole
b) Benzimidazole
c) Indole
d) Benzpyrazole
15. Acridine is _____
- a) Weak Base
b) SP² Hybridized
c) Aromatic
d) All of the above
16. 2-aminoisoquinoline is synthesized from isoquinoline by using which of the reagent?
- a) Ammonia
b) Sodium azide
c) NaNH₂/ Liq. Ammonia
d) None of the above
17. Hydrazoic acid is useful for the conversion of _____
- a) Acid to amide
b) Acid to alcohol
c) Acid to amine
d) All of the above
18. Zinc amalgam with hydrochloric acid is useful for the conversion of _____
- a) Ketone to aldehyde
b) Ketone to alcohol
c) Ketone to alkane
d) Ketone to alkene
19. Wolff-kishner is a _____ type of reduction reaction
- a) Acidic
b) Basic
c) Metal hydride
d) Catalytic hydrogenation
20. Which is unreactive in hydride reduction with NaBH₄?



Q.2 Long Answers (any 2 out of 3) (10 Mark Each)

(20)

- Write a detailed note on Geometrical Isomerism
 - Explain R, S system of nomenclature.
- Discuss the aromaticity and basicity of furan and thiophene
 - Write in detail oppenaur oxidation and backmann rearrangement.
- Explain the following heterocycles along with their synthesis and reactions
 - Quinoline
 - Indole

Q.3 Short Answers (any 7 out of 9) (5 Mark Each)

(35)

- What is Optical activity? Explain enantiomerism and diastereoisomerism with appropriate examples.
- Add a note on the resolution of the racemic mixture.
- Explain conformational isomerism with the example of cyclohexane and n-butane
- Write a note on atropisomerism.
- Explain the nomenclature of heterocyclic compounds with examples
- Write a detailed note on pyrrole including properties, synthesis, reactivity, and uses.
- Compare the basicity of pyridine with pyrrole and aliphatic amine.
- Write the structure and medicinal uses of pyrimidine, purine, azepines, oxazole, and thiazole.
- Give the synthesis of cyclohexa-1,4-diene from benzene with the mechanism.