

34

Seat No.: _____



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SARDAR PATEL UNIVERSITY

Bachelor of Science (Semester 5) Examination - 2022

US05CICV21: Organic Chemistry

Date: 10th November 2022, Thursday

Time: 10:00 AM to 01:00 PM

Total: 70 Marks

NOTE: Figure to the right indicate full marks of the questions.

Q-1 Multiple Choice Questions

[10]

1. Which of the following is a not a five-membered ring?

(a) Pyridine	(c) Furan
(b) Pyrrole	(d) Thiophene
2. Pyridine undergoes electrophilic substitution with fuming H₂SO₄ at 350°C to

(a) 2-Pyridinesulphonic acid	(c) 4-Pyridinesulphonic acid
(b) 3-Pyridinesulphonic acid	(d) None of these
3. Compounds with different atomic configurations in space but the same atoms bonded to each other are said to as having.

(a) stereoisomerism	(b) functional group isomerism
(c) chain isomerism	(d) position isomerism
4. The number of asymmetric carbons present in the "2-Bromobutanol" is

(a) 1	(c) 3
(b) 2	(d) 4
5. The instrument used to determine the optical activity is

(a) Refractometer	(c) Polarimeter
(b) Oscillator	(d) All of the above
6. N-Bromo succinimide is an importantreagent

(a) Reducing	(c) Methylating
(b) Oxidizing	(d) Brominating
7. Selenium dioxide is an importantreagent

(a) Reducing	(c) Brominating
(b) Oxidizing	(d) Methylating
8. Energies required for the following transitions in increasing order.

(a) $\sigma \rightarrow \sigma^* > n \rightarrow \sigma^* > \pi \rightarrow \pi^* > n \rightarrow \pi^*$	(c) $\sigma \rightarrow \sigma^* < n \rightarrow \sigma^* < \pi \rightarrow \pi^* < n \rightarrow \pi^*$
(b) $\sigma \rightarrow \sigma^* = n \rightarrow \sigma^* > \pi \rightarrow \pi^* > n \rightarrow \pi^*$	(d) $\sigma \rightarrow \sigma^* < n \rightarrow \sigma^* = \pi \rightarrow \pi^* > n \rightarrow \pi^*$
9. Which of the following transitions mainly occur in IR?

(a) Electronic transitions only	(b) Vibrational and rotational and transitions
(c) Rotational transitions only	(d) All the electronic, rotational, vibrational transitions
10. The possible number of peaks in 1H NMR spectrum of "Ethanol" structure is

(a) 1	(c) 3
(b) 2	(d) 4



(P.T.O)

Q-2 Short Answer Question (Attempt TEN out of TWELVE) [20]

1. Compare the basicity of Pyridine with that of Pyrrole.
2. Give a synthesis of Pyrrole.
3. Define term nucleophilic reaction.
4. What is the necessary and sufficient condition for enantiomerism?
5. Draw and specify as R or S nomenclature of $\text{CH}_3\text{CH}(\text{NH}_2)\text{COOH}$.
6. Give the difference between Stereospecific and Stereoselective Reactions.
7. Give synthetic application of Osmium tetroxide.
8. Write a reaction Hoffmann-Loffler reaction.
9. Differentiate term reaction and rearrangement.
10. Enlist various detectors used in UV spectrophotometer
11. What is basic principle of IR spectroscopy?
12. How many ^1H NMR signals do you expect in Benzoic acid.

Q-3 (A) Write a short note on electrophilic substitution in Pyridine. [05]
(B) Write a short note on electrophilic substitution in Pyrrole. [05]

OR

(A) Discuss the structure of Furan. [05]
(B) Write a short note on nucleophilic substitution reaction in Pyridine. [05]

Q-4 (A) Write a short note on Polarimeter. [05]
(B) Write a short note on Diastereomers. [05]

OR

(A) Write a short note on "Stereochemistry of tartaric acid". [05]
(B) Write a short note on enantiomers & meso compounds. [05]

Q-5 (A) Write a short note on N-Bromo succinimide. [05]
(B) Write a short note on Lead tetra acetate. [05]

OR

(A) Write a short note on Pinacol-Pinacolone rearrangement. [05]
(B) Write a short note on Benzilic acid rearrangement. [05]

Q-6 (A) Write the principle of IR spectroscopy and discuss the applications of IR-Spectroscopy. [05]

(B) Write a short note on main parts of ^1H NMR spectrometer. [05]

OR

(A) Explain double-beam system of UV spectrophotometer. [05]
(B) Write a note on instrumentation of IR spectroscopy. [05]

— X —
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