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SARDAR PATEL UNIVERSITY

Bachelor of Science (Semester – V) Examination October- 2025

US05CICH51: Advance Organic Chemistry

Date: 04/10/2025, Saturday

Time: 10:00 AM to 01:00 PM

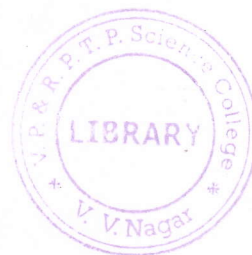
Total: 70 Marks

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

Q-1 Multiple Choice Questions. (All are compulsory)

[10]

1. A mixture of equal parts of two enantiomers, is called...
(a) Meso mixture (c) colloids mixture
(b) racemic mixture (d) alloys mixture
2. How many chiral carbon presents in $\text{CH}_3\text{CH}(\text{Br})\text{CH}_2\text{CH}_3$ structure?
(a) 0 (c) 2
(b) 1 (d) 4
3. Which instrument is used to study optically active compounds?
(a) Refractometer (c) Polarimeter
(b) Oscillator (d) pH meter
4. Complete the reaction: $\text{Me}_2\text{CHOH} + \text{Al-Hg} \xrightarrow{\text{CCl}_4/\text{Reflux}} ? + \text{H}_{2(g)}$
(a) $(\text{Me}_2\text{CHO})_3\text{Al}$ (c) $(\text{Me}_2\text{COOH})_3\text{Hg}$
(b) $(\text{Me}_2\text{CHOH})_2\text{Al}$ (d) $(\text{CH}_3\text{CHO})\text{Al}$
5. Which one is a mild reducing agent?
(a) ozone (c) Sodium borohydride
(b) N-bromosuccinimide (d) Hydrogen peroxide
6. Hypsochromic shift, also known as ...
(a) green shift (c) blue shift
(b) hypo shift (d) red shift
7. Which spectroscopy is also termed as vibrational spectroscopy?
(a) IR spectroscopy (c) ^{13}C NMR spectroscopy
(b) UV spectroscopy (d) ^1H NMR spectroscopy
8. How many IR vibrational modes are in CO_2 ?
(a) 2 (c) 4
(b) 6 (d) 8
9. Protons in same chemical environments are called...
(a) nonequivalent protons (c) Spin-Spin protons
(b) equivalent protons (d) germinal protons
10. How many ^1H NMR signals does $\text{CH}_3\text{CH}_2\text{COOH}$ show?
(a) 1 (c) 3
(b) 2 (d) 5



[4]

(P.T.O.)

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

[20]

1. Describe Geometric isomerism with example.
2. Define term 'Specific rotation'.
3. Define term 'chain isomers' with suitable example.
4. Write a preparation and properties of NaBH_4 .
5. Write a reaction for 'Hunsdiecker reaction'.
6. Write a preparation and properties of 'Diazomethane'.
7. Define term 'Chromophores & Auxochromes'.
8. Enlist the name of detectors used in UV spectroscopy.
9. What are the normal modes of vibration in IR spectroscopy?
10. In ^1H NMR spectrum of compound $\text{C}_2\text{H}_6\text{O}$ shows one signal only, a singlet. Deduce the structure of it.
11. Describe equivalent protons and nonequivalent protons
12. What are germinal protons?



Q-3 Write a note on Polarimeter in detail.

[10]

OR

Q-3 (A) Write a note on racemic modification.

[5]

(B) Discuss Enantiomerism and Optical activity in details.

[5]

Q-4 Write notes on 'Benzoin condensation reaction' and 'Bayer Villiger oxidation reaction'.

[10]

OR

Q-4 Discuss preparations and applications of 'N-bromosuccinamide' and 'Selenium dioxide'.

[10]

Q-5 Write a note on principle, instrumentation and application of UV spectroscopy.

[10]

OR

Q-5 Write a note on principle, instrumentation and applications of IR spectroscopy.

[10]

Q-6 (A) Write a note on Chemical Shift.

[5]

(B) Explain Spin-Spin Coupling and Coupling Constants.

[5]

OR

Q-6 Write a note on ^1H NMR spectroscopy.

[10]

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[2]