NAVRACHANA UNIVERSITY
a UGC recognized University

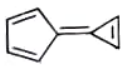
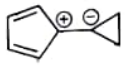
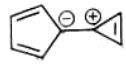
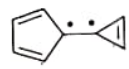
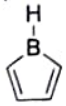
Enrollment #

School: School of Science
Program/s: M.Sc.-Chemistry
Year: 2nd **Semester:** Ist
Examination: End-Semester Examination
Examination year: December - 2022

Course Code: CH130 **Course Name:** **Physical Organic Chemistry** **Total Marks:** 40
Date: 07/12/2022 **Total Pages:** 4
Time: 11:30 am to 1:30 pm

Instructions:
(i) Please write in points
(ii) Use of calculator is allowed
(iii) For Q1 a, Q1 b and Q1 c provide a very brief justification for the choice you make.
Please draw structures neatly.

IQAC COPY

Q. No.	Details	Marks	CO	BT Level
Q.1	**(Question 1a) The number of π electrons in the cyclopentadienyl anion, is [Marks 2]** **(A) 2 (B) 4 (C) 6 (D) 8** **(Question 1b) Compound A shows a large dipole moment. Which structure adequately explain the observation [Marks 2]** (A)  (B)  (C)  (D)  **(Question 1c) Which of the following species is antiaromatic? [Marks 2]**     (I) (II) (III) (IV) (a) I (b) II (c) III (d) IV	**6**	**CO1** **CO3** **CO4**	**1,2,** **3,4,** **5**

MAYRACHANA UNIVERSITY
a UGC recognized University

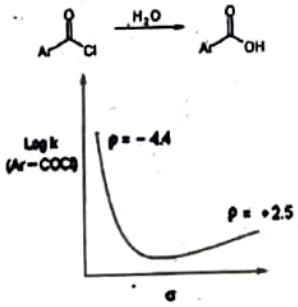
Enrollment #

School: School of Science
Program/s: M.Sc.-Chemistry
Year: 2nd **Semester:** Ist
Examination: End-Semester Examination
Examination year: December - 2022

Course Code: CH130 **Course Name:** **Physical Organic Chemistry** **Total Marks:** 40
Date: 07/12/2022 **Total Pages:** 4
Time: 11:30 am to 1:30 pm

Instructions:
(i) Please write in points
(ii) Use of calculator is allowed
(iii) For Q1 a, Q1 b and Q1 c provide a very brief justification for the choice you make.
Please draw structures neatly.

IQAC COPY

Q.2	**What does the change in slope indicate? Also propose reasonable mechanism(s) based on the nature of the plot.** **Shown below is a Hammett plot obtained for the reaction**  	5	CO1 CO3 CO4	1,2, 3,4, 5
Q.3	**Why Hammett equation fails with aliphatic compounds?**	5	CO1 CO3 CO4	1,2, 3,4, 5
Q.4	**In terms of the H/D kinetic Isotope Effect, explain (1) the more rapid loss of HI from CH_3CH_2I than DI from D_3CCH_2I when strong base is added and (2) the slightly faster rate of S_N1 or E_1 reactions of $(CH_3)_3CCl$ than that of $(CD_3)_3CCl$.**	4	CO1 CO3 CO4	1,2, 3,4, 5

NAVRACHANA UNIVERSITY
a UGC recognized University

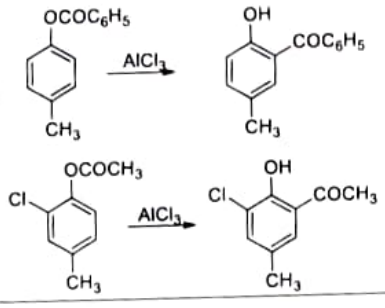
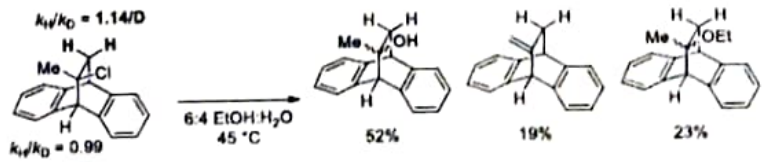
Enrollment #

School: School of Science
Program/s: M.Sc.-Chemistry
Year: 2nd **Semester:** Ist
Examination: End-Semester Examination
Examination year: December - 2022

Course Code: CH130 **Course Name:** **Physical Organic Chemistry** **Total Marks:** 40
Date: 07/12/2022 **Total Pages:** 4
Time: 11:30 am to 1:30 pm

Instructions:
(i) Please write in points
(ii) Use of calculator is allowed
(iii) For Q1 a, Q1 b and Q1 c provide a very brief justification for the choice you make.
Please draw structures neatly.

IQAC COPY

Q.5	**How cross over experiment can distinguish between intra molecular and inter molecular reactions. You may use the following Fries rearrangement to make your point.** 	5	CO1 CO3 CO4	1,2, 3,4, 5
Q.6	How does bonding Molecular Orbital different from antibonding molecular orbital? What is the unique feature of MO treatment of molecules compared to valance bond or other methods? **OR** What are the different ways to trap Reactive Intermediates in organic chemistry?	5	CO1 CO3 CO4	1,2, 3,4, 5
Q.7	**Based on the Kinetic Isotope effect (K_{C-H}/K_{C-D}) values of the two types of C-H bond explain the product distribution of the products** 	5	CO1 CO3 CO4	1,2, 3,4, 5

NAVRACHANA UNIVERSITY
a UGC recognized University

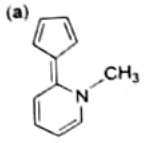
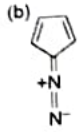
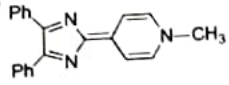
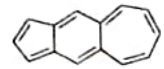
Enrollment #

School: School of Science
Program/s: M.Sc.-Chemistry
Year: 2nd **Semester:** Ist
Examination: End-Semester Examination
Examination year: December - 2022

Course Code: CH130 **Course Name:** **Physical Organic Chemistry** **Total Marks:** 40
Date: 07/12/2022 **Total Pages:** 4
Time: 11:30 am to 1:30 pm

Instructions:
(i) Please write in points
(ii) Use of calculator is allowed
(iii) For Q1 a, Q1 b and Q1 c provide a very brief justification for the choice you make.
Please draw structures neatly.

IQAC COPY

Q8	In the MO Diagram of Methane, how many electrons are involved? Why was elements of same symmetry mapped to each other in the construction of the Molecular Orbital. **OR** A single resonance structures is shown below for each of several molecules. Consider other resonance structures and identify those that would be expected to make a major stabilizing contribution to the molecule in question. (a)  (b)  (c)  (d) 	**5**	**CO1** **CO3** **CO4**	**1,2,** **3,4,** **5**

**********End of Question Paper**********