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School of Chemical and Life Sciences (SCLS)
M. Sc. Chemistry
Semester I Examination, 2023

Paper Name: Organic Chemistry I
Time: 3 hours

Paper Code: MCHCC102
Maximum Marks: 60

Note: This paper has 3 sections A, B, and C, Attempt all the three sections

Section A: *Answer* ***all*** *the questions;* ***Section B****: Answer* ***any 2*** *out of 4;* ***Section C:*** *Answer* ***all*** *the questions, each question has an* ***internal choice***

Abbreviations Used

CLO- Course Learning Outcome, PLO- Program learning Outcome, BTL- Bloom Taxonomy Level: BT level 1-Remember; BT level 2-Understand; BT level 3-Apply; BT level 4-Analyse; BT level 5-Evaluate, BT level 6-Create

SECTION A

Very Short Type Questions (*Attempt All*) **(10X1.5= 15 marks)**

Q. No	Explain the following with suitable examples	BTL	CLO	PLO
A 1.	Nonclassical carbocations	1 /2	3	1-3
A 2.	Gauche effect	1-3	3	1-3
A 3.	Prelog's rules	2/3	3	1-3
A 4.	Bonding in fullerenes	2/3	1	1-2
A 5.	Benzyne intermediate	2/3	3	1-3
A 6.	Hard and soft acids	2/3	2	1-3
A 7.	Optical activity of biphenyls	2-4	2	1-3
A 8.	Ambident nucleophiles	3	4	4-5
A 9.	Taft equation	2/3	5	4-5
A 10.	Non-benzenoid compounds	2/3	2	1-3

SECTION B

Long type Questions (Attempt *any two*) **(2X10= 20 Marks)**

B 1.	What do you mean by primary and secondary kinetic isotopic effects, explain with suitable examples.	4-6	5	5-7
B 2.	Describe in detail Hammond's postulates and the Hammett equation.	2-4	3	3-4
B 3.	What are substitution reactions? Explain the various types of substitution reactions with suitable examples.	4-6	4	4-6
B 4.	Describe in brief the effect of conformations on reactivity. Draw an energy profile diagram for conformations of cyclohexane.	4-6	3	4-5

SECTION C

Short-type Questions (Attempt *all* questions), Each question has an internal choice **(5X5=25 marks)**

C 1. Discuss with mechanism of acidic and basic hydrolysis of esters. 2-4 2/4 1-4

OR

What are inclusion compounds? Write about **any two** inclusion compounds of the following-

i) Cyclodextrins ii) Catenanes iii) Rotaxanes.

C 2. Explain the concept of neighbouring group participation with suitable examples. 3-5 3-4 3-4

OR

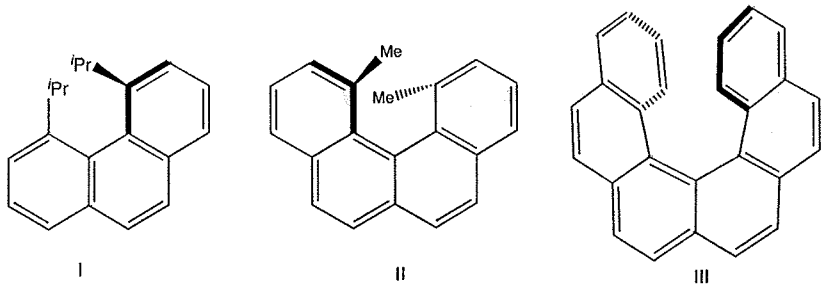
Describe in detail the structure, preparation, and reactions of carbenes.

C 3. (a) What do you understand by helicity or helical chirality? 3-5 3 3-4

OR

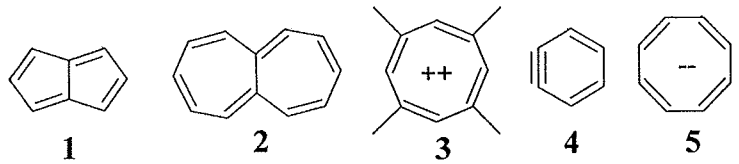
What do you understand by optical purity?

(b) Also specify the configuration for ***any two*** of the following molecules.

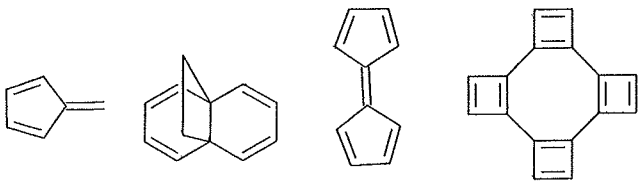


I II III

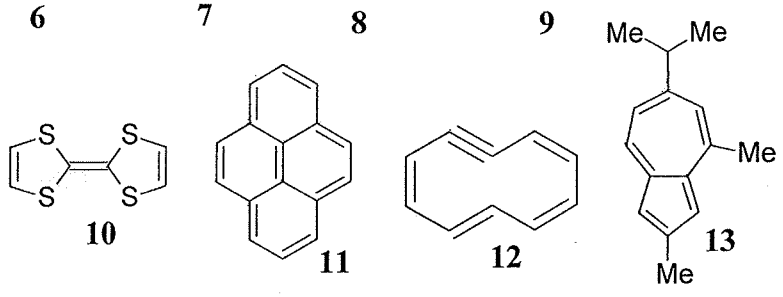
C 4. Categorize the following species as aromatic, homo-aromatic, non-aromatic and anti-aromatic **(Any Ten):** 5/6 2 1-4



1 **2** **3** **4** **5**



6 **7** **8** **9**



10 **11** **12** **13**

C 5. Give the reaction and Mechanism of ***any one*** of the following 5/6 4-6 5-7

i. Sommelet Hauser rearrangement
ii. Smiles rearrangement

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