BIRLA INSTITUTE OF TECHNOLOGY
MESRA – 835215, RANCHI, INDIA

UG

Name: …………………………………………………. Roll No.: …………………………………………..
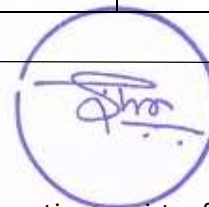
Branch: …………………………………………………. Signature of Invigilator: ……………………

Semester: IVth   Date: 29/04/2022 (MORNING)

Subject with Code: **CH209 ORGANIC CHEMISTRY-III, HETEROCYCLIC CHEMISTRY**

Marks Obtained	Section A (30)	Section B (20)	Total Marks (50)

INSTRUCTION TO CANDIDATE

1. The booklet (question paper cum answer sheet) consists of two sections. First section consists of MCQs of 30 marks. Candidates may mark the correct answer in the space provided / may also write answers in the answer sheet provided. The Second section of question paper consists of subjective questions of 20 marks. The candidates may write the answers for these questions in the answer sheets provided with the question booklet.

2. The booklet will be distributed to the candidates before 05 minutes of the examination. **Candidates should write their roll no. in each page of the booklet.**

3. Place the Student ID card, Registration Slip and No Dues Clearance (if applicable) on your desk. All the entries on the cover page must be filled at the specified space.

4. Carrying or using of mobile phone / any electronic gadgets (except regular scientific calculator)/chits are strictly prohibited inside the examination hall as it comes under the category of unfair means.

5. No candidate should be allowed to enter the examination hall later than 10 minutes after the commencement of examination. Candidates are not allowed to go out of the examination hall/room during the first 30 minutes and last 10 minutes of the examination.

6. Write on both side of the leaf and use pens with same ink.

7. The medium of examination is English. Answer book written in language other than English is liable to be rejected.

8. All attached sheets such as graph papers, drawing sheets etc. should be properly folded to the size of the answer book and tagged with the answer book by the candidate at least 05 minutes before the end of examination.

9. The door of examination hall will be closed 10 minutes before the end of examination. Do not leave the examination hall until the invigilators instruct you to do so.

10. Always maintain the highest level of integrity. Remember you are a BITian.

11. Candidates need to **submit the question paper cum answer sheets before leaving the examination hall**.

BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI

(END SEMESTER EXAMINATION)

CLASS: IMSC   **SEMESTER: IV**
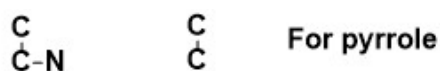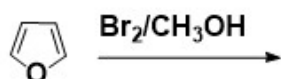
BRANCH: CHEMISTRY   **SESSION: SP/22**

SUBJECT: CH209

TIME: 2 Hrs.   **FULL MARKS: 50**

Part A (Answer any five questions): (5 X 2 = 10)

1. Outline the synthetic route for pyrrole compound which contain the below skeletal units.
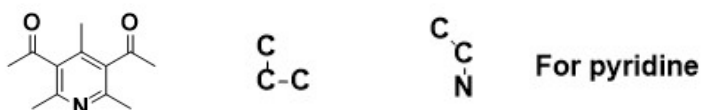
 For pyrrole

2. Predict the product(s) of the following reaction and justify:
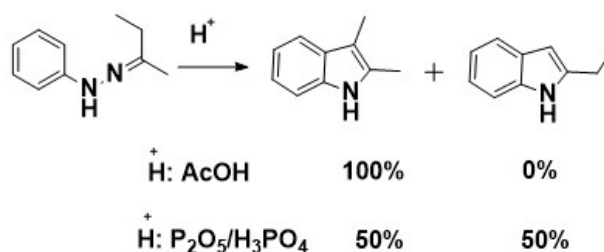

3. Show the steps for the Bischler-Napieralski synthesis of 1-methylisoquinoline starting from acid chloride.

4. Outline the synthesis of the pyridine derivative

 For pyridine

from the compounds having the following skeletal units:

5. Account for the following observation:

H: AcOH   100%   0%

H: P$_2$O$_5$/H$_3$PO$_4$ 50%   50%

6. Apply Fischer indole reaction for the preparation of Indole.

Part B (Answer any five questions): (5 X 2 = 10)

7. In Arrndt-Eistert synthesis two equivalent of diazo methane is required-why? What happens if one equivalent of diazo methane is used?

8. Suggest a route to obtain RNH_2 from R-I (R is primary alkyl group) without using any organometallic reagent.

9. Explain What happens when cyclopentanone is treated with diazomethane?

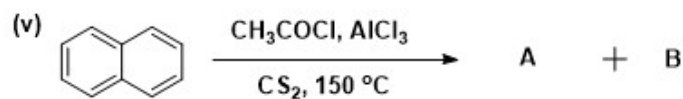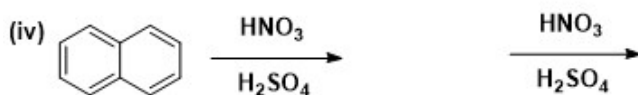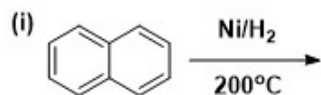10. Rationalize the following reaction with plausible mechanism.
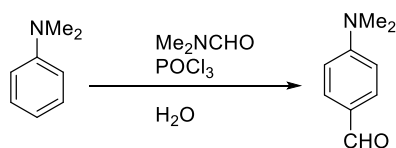
11. Between the following two diazonium cations which one undergoes nucleophilic displacement of nitrogen at a faster rate? Explain.

12. How can you separate a mixture of primary, secondary and tertiary aliphatic amines by Hinsberg method?
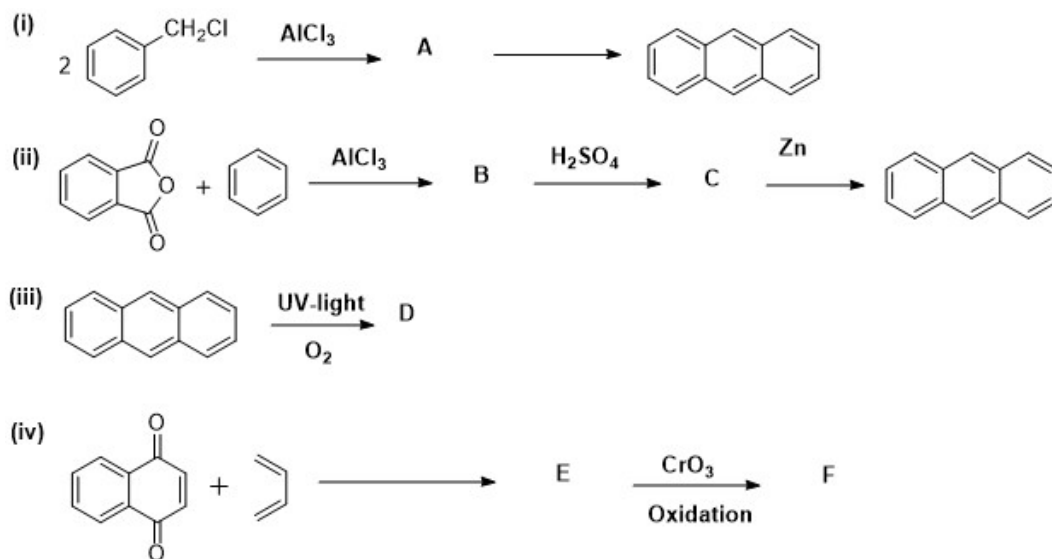
Part C (Answer all these questions) (5 X 2 = 10)

13. Predict the product(s) of the following reaction and justify:

(i)

Ni/H$_2$
200°C

(ii)

O$_3$

(iii)

Na   CO$_2$

(iv)

HNO$_3$ HNO$_3$
H$_2$SO$_4$ H$_2$SO$_4$

(v)

CH$_3$COCl, AlCl$_3$
CS$_2$, 150 °C   A   +   B

Part D (Answer all these questions): (2+3+2+3)

14. Predict the product(s) of the following reaction and justify:

(i)

(ii)

(iii)

(iv)

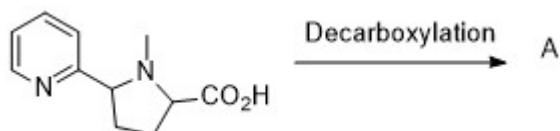**Part D (Answer all these questions): (1 X 4 = 4 + 2+2+2)**

15. A fatal dose for man of Nicotine is _____

16. The structural formula of Cocaine is_____

17. The structural formula of Morphine is_____

18. The structural formula of Hygrine is_____

19. Predict the product(s) of the following reaction:

20. Write one methods each for the synthesis of (a) Citral **or** (b) Neral

21. Write any one methods for the synthesis of Nicotine.

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