



Date:
Registration number:

ST. JOSEPH'S COLLEGE (AUTONOMOUS), BENGALURU-27
M.Sc. (ORGANIC CHEMISTRY) - III SEMESTER
SEMESTER EXAMINATION: OCTOBER 2021
(Examination conducted in January-March 2022)
OCH 9319 – NATURAL PRODUCTS, HETEROCYCLIC
CHEMISTRY AND HETEROGENEOUS CATALYSIS

Time- 2 ½ hrs

Max Marks-70

This question paper contains TWO printed pages and THREE parts

Part A

Answer any SIX of the following questions

(6 x 2 = 12)

1. How is camphor synthesized commercially?
2. Write the name and structure of starting material which trimerizes to give 1,3,5-triazine.
3. What do you mean by heterogeneous catalyst? Give an example.
4. Write the structure of bambaykol. What is its biological significance?
5. What do you mean by anchoring of catalyst? Give one advantage.
6. How are pheromones used in pest control?
7. Write the chemical reaction of synthesis of 1,4-thiazine using its corresponding dione as starting material.
8. How do you obtain vitamin B₁₂ from cobyrinic acid?

Part B

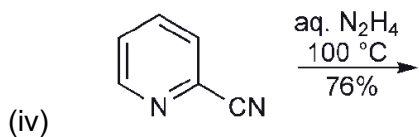
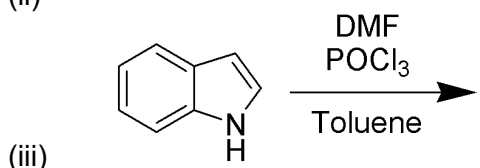
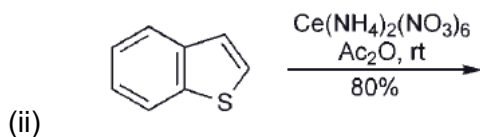
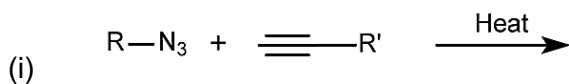
Answer any FOUR of the following questions

(4 x 12 = 48)

9. (a) Write the pathway for the conversion of arachidonic acid to prostaglandin E₁.
(b) Give the evidence for structural elucidation of abietic acid.
10. (a) Discuss the mechanism of copper-catalyzed azide-alkyne method of synthesis of 1,2,3-triazole. Comment on the electrophilic substitution reactions of 1,2,3-triazole using any two suitable examples.
(b) Between quinoline and isoquinoline, which is more basic and why? Write the products formed on reaction of quinoline with (i) peracetic acid (ii) alkaline KMnO₄.
11. (a) Write biosynthetic pathway for the synthesis of quinine.
(b) Write the steps involved in the biosynthetic pathway for morphine.
12. (a) Arrange the diazines, triazines and tetrazines in increasing order of their basic strength. Give reason in support of your answer. Give one example of Diels-Alder reaction for each of diazine, triazine and tetrazine.
(b) What do you mean by supported catalyst? Using a suitable example, discuss the need of a supported catalyst. Also mention the factors affecting its activity.
13. (a) Write the biosynthetic pathway for the synthesis of α -pinene.
(b) Explain the steps involved in the synthesis of haemin in vivo.

14. (a) What do you mean by TS-1 catalyst? How do you synthesize it using sol-gel method? Give an example of organic chemical reaction catalysed by it.

(b) Complete the following reactions:



(4 + 8)

Part C

Answer any TWO of the following questions

(2 x 5 = 10)

- Outline the mechanism for the synthesis of benzofuran using *o*-hydroxybenzaldehyde as a starting material.
- How would you carry out the oxidation of indole in presence of *N*-bromosuccinimide (NBS)?
- Write a mechanism for the conversion of 2,2'-dimethyl-1-cyclohexanol to 1,2-dimethyl cyclohex-1-ene.
