18P410 (Pages: 3) Name……..……

Reg. No……..

FOURTH SEMESTER M.Sc. DEGREE EXAMINATION, APRIL 2020

(CUCSS - PG)

(Regular/Improvement/Supplementary)

CC15P CH4 E06 - NATURAL PRODUCTS &POLYMER CHEMISTRY

(Chemistry)

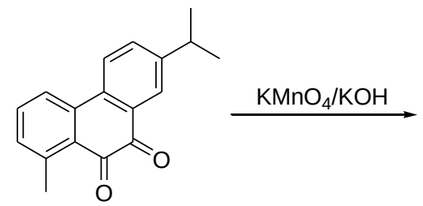
(2015 Admission onwards)

Time: Three Hours Maximum: 36 Weightage

Section A

Answer ***all*** questions. Each question carries 1 weightage.

1. What is the structural difference between chlorophyll-a and –b? How they can be identified in laboratory?
2. Complete and explain the following reaction.



3. What are essential oils? Draw the structure of the major constituents of citronella oil.
4. Explain briefly why cortisone is considered as a steroid compound.
5. Briefly explain what do you understand by ‘aromatherapy’.
6. Draw the structure of copper(II) phthalocyanine. What structural features of phthalocyanines makes it as potential candidate to be used as dyes in organic solar cells?
7. What are liquid crystalline polymers? Give an example.
8. Write down the expression for calculating ‘viscosity average molecular weight’. Explaining the terms, mention its importance.
9. State and explain Flory’s theta temperature?
10. What are spherullites? How they are formed?
11. Illustrating an example, explain what is optical lithography.
12. What are polyurethanes? Give any two of its applications.

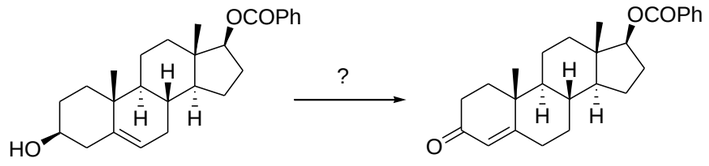
(12 x 1 = 12 Weightage)

Section B

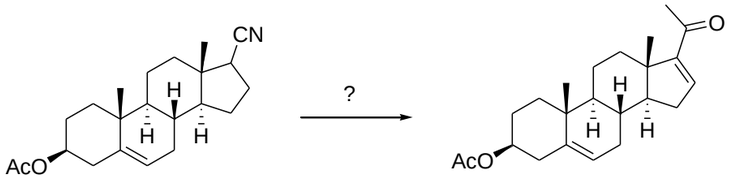
Answer any ***eight*** questions. Each question carries 2 weightage.

13. "Supramolecular chemistry is considered as the chemistry of molecular assemblies and of the intermolecular bond". The statement was given by J-M. Lehn, Nobel laureate of 1987. Validate the statement using any two examples.
14. Identify the reagents/reactants for following conversions and explain the reaction in each case.

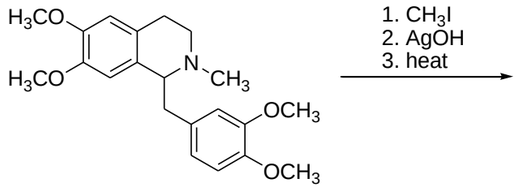
(a)



(b)



15. Chemically what are carotenoids? Describe the physiological action and the method of isolation of carotenoids.
16. What is papaverine? Explain its biosynthesis.
17. Predict the products of the following reaction and rationalize.



18. Briefly explain the structural elucidation of testosterone.
19. What are Ziegler-Natta catalysts? Explain the mechanism and advantages of Ziegler-Natta polymerisation reactions.
20. Explain the kinetics and mechanism of Free radical addition polymerisation.
21. Explain the Flory-Huggins theory of polymer solutions.
22. Explain the mechanism of conductivity and p-doping of polythiophenes.
23. What are cationic metallocenes? Giving an example, explain its mechanism of stereoregulation of polymers.
24. Explain the synthesis, structure and applications of: (i) Polystryrene; (ii) PMMA.

(8 x 2 = 16 Weightage)

Section C

Answer any ***two*** questions. Each question carries 4 weightage.

25. Discuss in detail the structure elucidation of quinine.
26. Based on the structure, explain how the steroids are classified. Explain the structure elucidation of cholesterol.
27. Emphasising suitable examples, give detailed account on each of the following polymerisation techniques: (a) Bulk polymerisation; (b) Solution Polymerisation; (c) Suspension polymerisation; (d) Emulsion polymerisation.
28. (a) Explain the tacticity of polymers. Discuss its significance in the context of properties of polymers.

    (b) Describe the determination of molecular weights of polymers using:

    (i) GPC; (ii) Light scattering studies.

(2 x 4 = 8 Weightage)

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