

15P410

(Pages: 2)

Name.....

Reg. No.....

**FOURTH SEMESTER M.Sc. DEGREE EXAMINATION, MARCH 2017**

(CUCSS - PG)

(Chemistry)

**CC15P CH4 E06 – NATURAL PRODUCTS & POLYMER CHEMISTRY**

(2015 Admission)

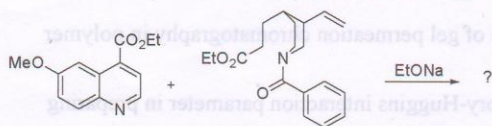
Time: Three Hours

Maximum: 36 Weightage

**Section A**

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

1. What are carotenoids? Among  $\alpha$ ,  $\beta$  or  $\gamma$ -carotenes, which one is optically active and give its structure.
2. Predict the product and explain the following reaction.



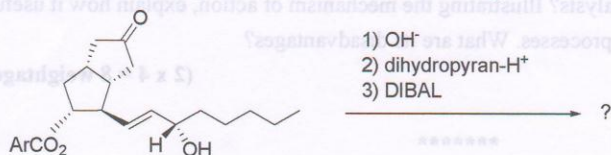
3. What is isoprene rule? Illustrate using an example.
4. What is the structural difference between prostaglandin  $E_2$  and prostaglandin  $F_{2\alpha}$ ?
5. What are alkaloids? Give an example.
6. Mention the common structural linkage seen in flavonoid compounds. Give the structure of chalcones and flavones.
7. What are liquid crystalline polymers? Give an example.
8. Give the Flory-Rehner equation and explain the terms.
9. What are spherulites?
10. The X-ray diffraction patterns of most polymers contain sharp as well as broad and diffuse bands. Account for the observation.
11. Preparation of nylon 6,6 is usually carried out under inert atmosphere of  $N_2$  or  $CO_2$ . Why?
12. What do you mean by autoacceleration in polymerisation techniques?

(12 x 1 = 12 weightage)

**Section B**

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

13. Write down the product formed in the following reaction and explain the reactions.



14. What are supramolecular systems? Illustrating an example, describe how the supramolecular systems exhibit molecular recognition.
15. Explain the method of isolation of lemon grass oil. Give the structures of the important constituents present in it.
16. Giving a suitable example, explain how Hofmann exhaustive methylation reaction is useful in structural elucidation of alkaloids.
17. Briefly explain the structural elucidation of oestrone.
18. Explain the structural similarity of chlorophylls and phthalocyanines.
19. Explain the synthesis of PMMA and polyurethanes. Write down any two applications of each.
20. What are conducting polymers? Explain the structural features that help polypyrroles in acting as a conducting polymer.
21. Describe the principle and instrumentation of gel permeation chromatography in polymer fractionation.
22. Explain the importance of knowing the Flory-Huggins interaction parameter in preparing polymer solutions.
23. What are bulk polymerisation and solution polymerisation? Compare their advantages and disadvantages.
24. Explain the mechanism of polymerisation of caprolactam.

(8 x 2 = 16 weightage)

### Section C

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

25. Explain the structural elucidation of atropine.
26. (a) Explain the chemistry involved in the conversion of cholesterol into testosterone.  
(b) Based on the structure, explain how the terpenoids are classified. Explain the methods of isolation of terpenoids.
27. Explain the kinetics and mechanism of: (a) Free radical addition polymerisation (b) Ionic polymerisations (c) polycondensation.
28. (a) Explain the tacticity of polymers. Discuss its significance in the context of properties of polymers.  
(b) What are Ziegler-Natta catalysts? Illustrating the mechanism of action, explain how it useful in controlling polymerisation processes. What are its disadvantages?

(2 x 4 = 8 weightage)

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