

LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034



M.Sc. DEGREE EXAMINATION – CHEMISTRY

SECOND SEMESTER – APRIL 2022

PCH 2601 – BIOMOLECULES AND NATURAL PRODUCTS

Date: 24-06-2022

Dept. No.

Max. : 100 Marks

Time: 09:00 AM - 12:00 NOON

Part – A

Answer ALL Questions.

(10 × 2 = 20)

1. Show the anomeric and configurational carbon with Fischer's projection of D-glucose.
2. Write the functions of lipids.
3. What is Donnan effect?
4. Briefly write the chemical property of amino acid due to carbonyl group.
5. State the biological functions of hormones.
6. Draw the molecular structure of vitamin B₁₂.
7. What is Zeisel's test?
8. Give the structure of morphine and mention any two of its functions.
9. State special isoprene rule.
10. What is Tilden's reagent? Mention its use.

Part – B

Answer any EIGHT Questions.

(8 × 5 = 40)

11. What are glycosides? How is phenyl-β-D-glucopyranoside synthesized?
12. Draw a Fischer projection, a Haworth projection and a chair conformation for sucrose.
13. What is β-oxidation? How is palmitic acid oxidized?
14. Describe size exclusion or gel filtration chromatography used in protein separation.
15. Illustrate the steps involved in urea cycle.
16. Discuss the synthesis of cortisone.
17. Draw the molecular structures of adrenaline, thyroxine, aldosterone, oestrogen and androgen and mention the physiological function of each one of them.
18. Explain the general methods of structural determination of alkaloids.
19. Elucidate the structure with a method of synthesis for atropine.
20. Discuss the general methods of determining the structure of cadinene.
21. Elucidate the structure of squalene.
22. Explain the synthesis of β-carotene.

Part – C

Answer any FOUR Questions.

(4 × 10 = 40)

23. Discuss the sequence of reactions involved in TCA cycle.
- 24a. Write the functions of phospholipids. (5)
b. Explain the transcription process of enzyme catalysed synthesis of RNA and DNA. (5)
- 25a. How are proteins separated using electrophoresis method? (5)
b. Explain the oxidation of α-tocopherol highlighting the 6-hydroxy chroman system. (5)
- 26a. Write the structure of β-carotene and explain its antioxidant action. (5)
b. Discuss the role of olefinic reagents and the oxidative degradation in determining the structure of alkaloids. (5)
27. Discuss the chemical methods of determining the structure of papaverine with a suitable method of synthesis.
28. Elucidate the structure of vitamin A and propose a method of synthesis.

@@@@@@