



**LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034**

**M.Sc. DEGREE EXAMINATION – CHEMISTRY**

**SECOND SEMESTER – APRIL 2018**

**17/16PCH2ES01– BIOMOLECULES AND NATURAL PRODUCTS**

Date: 25-04-2018

Dept. No.

Max. : 100 Marks

Time: 01:00-04:00

**Part-A**

*Answer ALL questions.*

**(10 × 2= 20)**

1. How do epimers and anomers differ?
2. How are lipids classified?
3. How is dialysis of protein carried out?
4. What are DNA intercalators? Give an example.
5. List any two biological importance of vitamin-A and give its sources.
6. How do food materials act as antioxidants?
7. How will you ascertain the methoxy groups in alkaloids?
8. Give the structure of morphine and mention any two functions of it.
9. State the special isoprene rule and gem-dialkyl rule.
10. Name the methods of extraction of terpenoids.

**Part-B**

*Answer any EIGHT questions.*

**(8 × 5 = 40)**

11. Explain the synthesis of phenyl-β-D-glucopyranoside.
12. Draw a Fischer projection, a Haworth projection and a chair conformation for sucrose.
13. Discuss any two methods of separation and purification of proteins.
14. Draw and explain the Watson-Crick model of DNA.
15. Give the structure and biological functions of vitamin-B<sub>12</sub> and folic acid.
16. Explain the functions of various steroidal and non-steroidal hormones.
17. How are the food stuffs protected by natural antioxidants? Discuss with any two examples.
18. Explain the general methods of structural determination of alkaloids.
19. Elucidate the structure with a method of synthesis for cocaine.
20. Explain any one chemical method to identify hydroxyl and carbonyl functional groups in terpenoids.
21. How is the presence of conjugated double bond identified in zingiberene?
22. Write the synthesis of vitamin-A.

**Part-C**

*Answer any FOUR questions.*

**(4 × 10= 40)**

23. Discuss the sequence of reactions involved in the conversion of glucose into lactate.
- 24a. Explain the process of β-oxidation of fatty acids.
  - b. How are proteins classified based on the complexity of their structure? **(5+5)**
- 25a. Describe the complete and systematic synthesis of proteins by nucleic acids. **(7+3)**
  - b. Explain urea cycle.
- 26a. How is androsterone synthesized from 5α-choletanyl-3β-acetate? Mention its functions. **(5)**
  - b. Explain the antioxidant and pro-oxidant properties. **(5)**
- 27a. How would you determine the structure of papaverine? **(6)**
  - b. How is heptaphylline synthesized? **(4)**
- 28a. Write the structural elucidation of squalene. **(5)**
  - b. How are the positions of side chain, angular methyl group and two double bonds identified in abietic acid? **(5)**

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