

(Pages : 4)

K – 2610

Reg. No. : .....

Name : .....

**Third Semester B.Sc. Degree Examination, March 2021**

**Career Related First Degree Programme under CBCSS**

**Chemistry**

**Complementary Course for Biochemistry and Industrial Microbiology**

**CH 1331.7 : BIO-ORGANIC CHEMISTRY**

**(2019 Admission Regular)**

Time : 3 Hours

Max. Marks : 80

**SECTION – A**

Answer **all** questions. Answer in one word to maximum of two sentences.

Each question carries **1** mark.

1. What is the internal standard used in  $^1\text{H}$  NMR spectroscopy?
  2. What is meant by plane polarized light?
  3. Draw the structure of L-glyceraldehyde.
  4. What is a racemic mixture?
  5. What are nucleophiles?
  6. What is meant by heterolytic bond fission?
  7. Predict the total number of peaks in the  $^1\text{H}$  NMR spectrum of acetone.
  8. What are the monomers of nylon-6,6.
  9. How many optical isomers are possible for D-glucose?
  10. Draw the structure of  $\beta$ -D-glucopyranose.
- (10 × 1 = 10 Marks)**

P.T.O.

## SECTION – B

Short answer type

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

11. What are epimers? Give examples.
12. What are the industrial application of cellulose?
13. What are thermosetting polymers? Give an example.
14. What are the advantages of vulcanized rubber?
15. Which is more stable 1-butene or 2-butene? Justify your answer.
16. What is steric effect? Explain.
17. Which conformation of cyclohexane is more stable? Why?
18. Draw the *E* – and *Z*– configurations of 1-chloro but-2-ene.
19. What are block copolymers? Illustrate with an example.
20. What is  $R_F$  value? What is its significance?
21. List the factors affecting chemical shift value.
22. What is spin-spin coupling?
23. What are stokes lines in Raman spectra?
24. What are the applications of HPLC?
25. Draw the Newman projection formula for the most stable conformation of ethane.
26. What is *meso*-form? Explain.

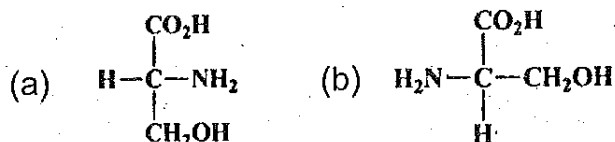
(8 × 2 = 16 Marks)

SECTION – C

Short essay type

Answer **any six** questions. Each question carries **4** marks.

27. Write a note on structure of cellulose.
28. Explain mutarotation with an example.
29. Assign R and S designation for the following compounds.



30. Distinguish between fiber, elastomer and plastics.
31. What is meant by weight average molecular mass of polymers? Explain the experimental determination of weight average molecular mass of polymers.
32. Write a short note on the formation and stability of carbocations.
33. What are enantiomers? How they can be separated?
34. Discuss about relative and absolute configuration.
35. Write a note on chiral drugs.
36. Draw and explain  $^1\text{H}$  NMR spectrum of 1,1,2-tribromoethane.
37. Differentiate between adsorption and partition chromatography.
38. Raman spectroscopy is often considered to be complementary to IR spectroscopy.

Explain.

(6 × 4 = 24 Marks)

## SECTION – D

Answer **any two** questions. Each question carries **15** marks.

39. Write note on:
- (a) Bio-degradable polymers.
  - (b) Step growth polymers.
  - (c) Number average molecular mass of polymers.
40. Discuss the following electron displacement effects and their significance.
- (a) Inductive effect.
  - (b) Electromeric effect.
  - (c) Mesomeric effect.
41. Discuss:
- (a) Interconversion of glucose to fructose.
  - (b) Classification of carbohydrates.
42. Discuss:
- (a) Conformational analysis of n-butane.
  - (b) E-Z system of nomenclature of geometrical isomers.
43. Write short notes on:
- (a) Thin layer chromatography and its applications.
  - (b) Ion exchange chromatography and its applications
44. Discuss:
- (a) Principles of  $^1\text{H}$  NMR spectroscopy.
  - (b) Comparison between Raman and IR spectroscopy.

**(2 × 15 = 30 Marks)**