C 1114 (Pages : 3) Name.....

Reg. No.....

SIXTH SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION
MARCH 2021

Chemistry

CHE 6B 10—ORGANIC CHEMISTRY—III

Time : Three Hours Maximum : 80 Marks

Section A (One Word)

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

1. How many absorption peaks are present in the ^1H NMR spectrum of pentan-3-one ?
2. ———— is an example of aldopentose.
3. The monosaccharides which differs only in the configuration of C-2 are known as ————.
4. The base pair of Adenine in DNA is ————.
5. ———— is a non-reducing sugar.
6. ———— structure of protein is unaffected during denaturation.
7. ———— is an example of [3, 3] sigmatropic rearrangement.
8. Monomer of natural rubber is ————.
9. Deficiency disease of Vitamin C is ————.
10. The process by which DNA duplicate creating two exactly identical molecules is known as ————.

(10 × 1 = 10 marks)

Section B (Short Answer)

Answer at least **five** *questions.*
Each question carries 4 *marks.*
All questions can be attended.
Overall Ceiling 20.

11. Write any *four* IR frequencies of benzoic acid.
12. How will you distinguish the presence of ethyl group ($CH_3 - CH_2$) in a NMR spectrum ?

Turn over

13. Write an evidence to show that glucose contains a straight chain of six carbon atoms.

14. Draw the cyclic structure of glucose.

15. What is inversion of cane sugar ?

16. What is the general structure of amino acids ?

17. Define iodine number.

18. Draw the structure of a female sex hormone.

19. Write the differences between DNA and RNA.

20. State isoprene rule.

21. What are alkaloids ? Give the structure of any *two*.

22. With FMO explanation show that Diels-Alder reaction is thermally allowed and photochemically forbidden.

(5 × 4 = 20 marks)

Section C (Paragraph)

Answer at least **four** *questions.*
Each question carries 7 marks.
All questions can be attended.
Overall Ceiling 28.

23. How will you convert glucose to fructose ?

24. How will you distinguish the following molecule by IR spectroscopy : (i) Ethanol and acetone ; and (ii) Benzaldehyde and phenol ?

25. Describe solid phase peptide synthesis of a dipeptide.

26. Draw the cyclic structure of maltose and sucrose.

27. What are biological functions of lipids ?

28. Explain Transcription and translation.

29. Write examples of [1, 3], [1, 5] and [3, 3] sigmatropic rearrangements.

30. What is vulcanization and how does it change the properties of rubber ?

(4 × 7 = 28 marks)

Section D

Answer any **two** *questions.*
Each question carries 11 *marks.*

31. Identify the compound :

    Molecular formula : $C_8H_8O_2$, UV λ_{max} : 276 nm.

    IR spectra : 3100, 3018, 2968, 1699, 1602, 1496 cm^{-1}.

    ^1H NMR spectra : δ (ppm) 3.7 (2 H) singlet, 6.8 – 7.2 (5 H) multiplet – 11.2 (1 H) singlet.

32. Describe the structure of nucleotides and DNA.

33. Draw the molecular orbitals of 4n and $4n + 2$ system and explain the «iectro cyclic reactions of butadiene and hexatriene systems.

34. How hormones are classified ? Explain the secreting organ, biological function and structure of one example of each group.

(2 × 11 = 22 marks)