

C 1114

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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  $^1\text{H}$  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 ( $\text{CH}_3 - \text{CH}_2$ ) 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  $\lambda_{max}$  : 276 nm.

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

$^1H$  NMR spectra :  $\delta$  (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 electrocyclic 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)