

17U611

(Pages: 3)

Name: .....

Reg. No.....

**SIXTH SEMESTER B.Sc. DEGREE EXAMINATION, APRIL 2020**

(CUCBCSS-UG)

(Regular/Supplementary/Improvement)

**CC15U CHE6 B10 - ORGANIC CHEMISTRY III**

Chemistry - Core Course

(2015 Admission onwards)

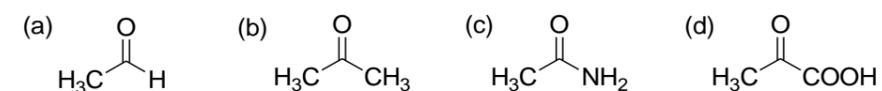
Time: Three Hours

Maximum: 80 Marks

**Section A**

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

1. Arrange the following compounds in the increasing order of their carbonyl stretching frequencies in their IR spectra.



2. Name the internal standard used in NMR spectroscopy.  
3. Name the water insoluble component formed when starch is stirred with water.  
4. What is Benedict's reagent?  
5. Write down the structure of vitamin C.  
6. Give the structure of Diel's hydrocarbon.  
7. What is Million's reagent?  
8. Name the process by which DNA makes a copy of itself during cell division.  
9. Draw the HOMO of allyl radical.  
10. Name the symmetry allowed mode of interaction in cycloaddition reactions.

**(10 x 1= 10 Marks)**

**Section B**

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

11. State and explain isoprene rule.  
12. Write down the structure of piperine. Why it is considered as an alkaloid compound?  
13. What is DNA finger printing? Mention its applications.  
14. Differentiate between Cope rearrangement and Claisen rearrangement reactions.  
15. Differentiate between HDL and LDL. Among them, which causes heart attack and why?  
16. What are peptide hormones? Give an example.  
17. What is mutarotation?

(1)

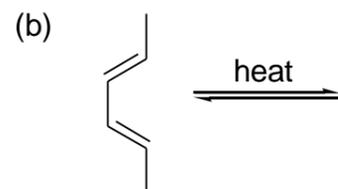
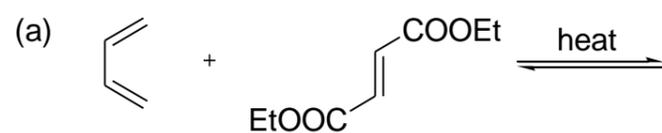
**Turn Over**

18. Explain the chemistry of Hopkins-Cole test for proteins.
19. The *penta*-acetylated product of  $\alpha$ -D-glucopyranose does not give Tollens test. Why?
20. Write down the method of analysis of urine sugar.
21. Predict the signal pattern of the  $\text{CH}_3$  protons in the NMR spectra of the following compounds. (a) Acetaldehyde; (b) Toluene.
22. How will you distinguish between 1,3-pentadiene and 1,4-pentadiene by UV spectroscopy?

(10 x 2 = 20 Marks)

**Section C**Answer any *five* questions. Each question carries 6 marks.

23. What is 'finger print region' in IR spectroscopy? Mention its importance. How will you distinguish the following pairs of compounds using IR spectroscopy?
- (a) Ethyl alcohol and diethyl ether
- (b) Acetic acid and ethyl acetate.
24. Drawing the cyclic structures, predict the reducing sugar among sucrose and lactose. Justify your answer.
25. Explain the fundamental differences between primary and secondary structure of proteins.
26. What are lipids? Explain the significance of the terms 'Saponification number' and 'Iodine number' in the study of lipids.
27. Explain the source, structure and physiological functions of nicotine and quinine.
28. Explain any two methods for the isolation of essential oils.
29. Indicating the stereochemistry, find out of the product of the following reactions. Explain each reaction.



30. Identify and explain the pericyclic reactions involved in the formation of vitamin D in human body.

(5 x 6 = 30 Marks)

(2)

**Section D**Answer any *two* questions. Each question carries 10 marks.

31. Draw the  $\pi$ -molecular orbitals of  $\text{C}_6$  conjugated system. Identifying the FMOs, explain the hexatriene-cyclohexadiene interconversion under thermal as well as photochemical conditions.
32. (i) What do you understand by the term 'chemical shift' in NMR spectroscopy? Draw the  $^1\text{H}$  NMR spectrum of propanoic acid. Indicate also the splitting pattern of various signals.
- (ii) Write a short note on the applications of UV-Vis spectroscopy.
33. (i) Drawing the cyclic structures, explain the structural features that are responsible for the differences in chemical properties of glucose and fructose.
- (ii) Describe the Killiani-Fischer synthesis of glucose from arabinose.
34. Explain:
- (i) Merrifield solid phase peptide synthesis.
- (ii) Structure determination of peptides using Edmann degradation method.

(2 x 10 = 20 Marks)

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