Or

10. (a) Describe the secondary structure of DNA with an appropriate illustration. 5

(b) Write down the structures of the following: 2+3=5

(i) 2′-deoxyadenosine

(ii) Adenosine 5′-monophosphate

★★★

UG (CBCS) EVEN SEMESTER EXAMINATION, 2024

EDUCATION
(B.Sc. B.Ed.)

8th Semester

Course No. : BSCH – 801
(Organic Chemistry)

Full Marks : 50
Pass Marks : 20

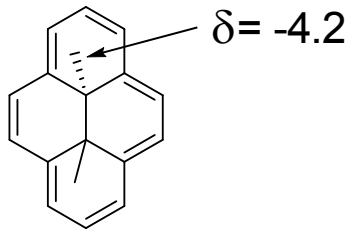
Time : 2 hours

The figures in the margin indicate full marks for the questions

(*Answer five questions*)

1. (a) The signal for the CH-protons in the proton NMR spectrum of benzyl alcohol appears at δ = -4.6, Calculate the difference in frequency, expressed in Hz, between this and the TMS signal in a 300 MHz NMR spectrum. 3

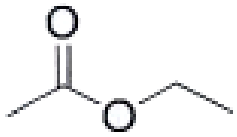
(b) "In dimethyl derivative of pyrene, the methyl groups appear at δ = - 4.2, lower in frequency than TMS." Explain. 3



(c) Which of the following nuclei exhibit NMR phenomenon? 2

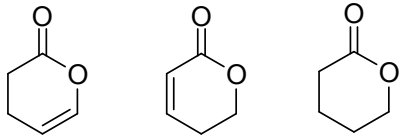
^{11}B , ^{12}C, ^{14}N, ^{16}O, ^{19}F, ^{31}P

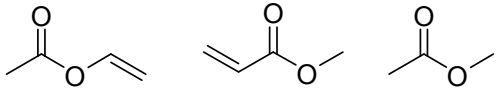
(d) Predict the multiplicities of the signals in the proton NMR spectra of ethyl acetate. 2

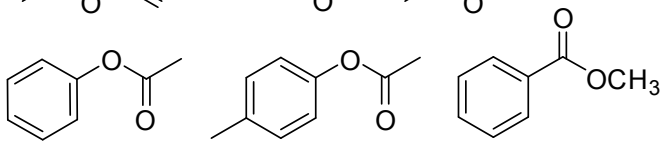


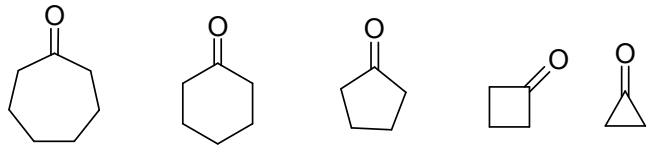
Or

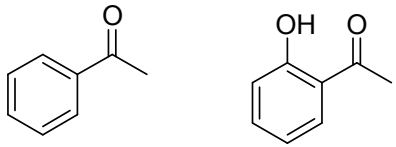
2. Provide the relevant justifications and arrange the followings in ascending order of C=O stretching. 2x5=10

(i) 

(ii) 

(iii) 

(iv) 

(v) 

(b) Define the following terms : 4

(i) Endogenous and Exogenous compounds;

(ii) Agonists and Antagonists;

(iii) Bacteriostatic and Bactericidal;

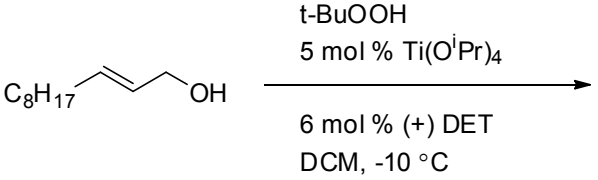
(iv) In vivo and in vitro.

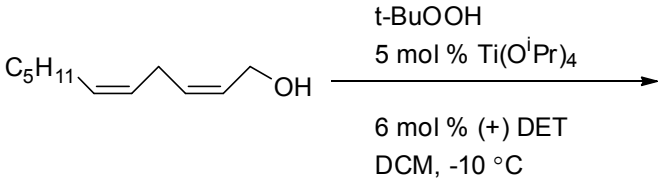
(c) Define the term "antibiotics". 1

Or

8. (a) *"In nucleophilic addition with organometallic or metal hydride reagents on chiral aldehydes or ketones, the existing chiral center brings about asymmetric introduction."* Explain. 5

(b) Write down the product for the following reactions 2+3=5

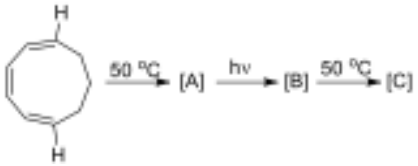




9. (a) What is Carboxypeptidase A? Mention one reaction catalyzed by Carboxypeptidase A. 2+3=5

(b) How does NAD^+ oxidize a substrate? Provide mechanism. 5

5. (a) The following reactions proceed through electrocyclic ring closure-ring opening-ring closure sequence. Identify the structure and stereochemistry of A, B and C respectively. 5



(b) What are suprafacial and antarafacial bond formation? Explain with suitable diagram. 2

(c) Complete the following reaction and predict the stereochemistry of the products. 3

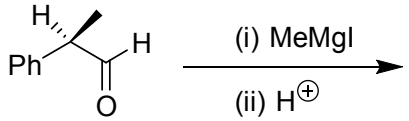
Or

6. (a) "[1, 5]-sigmatropic hydrogen under thermal condition takes place via suprafacial migration whereas [1, 7] sigmatropic hydrogen shifts under same condition takes place via antarafacial migration." Explain. 5

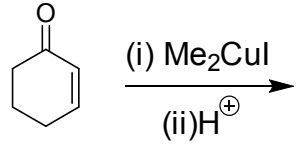
(b) The pyrolysis of meso-3,4-dimethyl-1,5-diene gives selectively E, Z-2, 6-octadiene. What is the name of the reaction? Explain the specific stereochemical outcome. 5

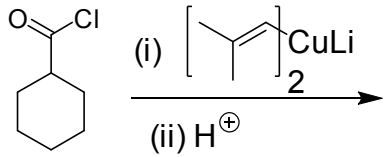
7. (a) What do you mean by pharmacokinetic phase? Discuss the different steps in Pharmacokinetic phase. 1+4=5

3. (a) Discuss the stereoselectivity of Grignard reagent with carbonyl compounds for the following reaction. 5



(b) Predict the products for the following reactions and provide mechanisms. 2+3=5

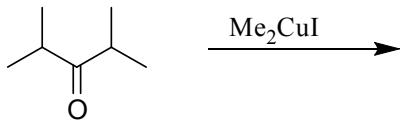




Or

4. (a) How will you correlate the reactivity of organometallic compounds with their ionic character? 3

(b) Write down the product for the following reaction. Provide mechanism. 2



(c) How does allylic and benzylic Grignard reagents react with carbonyl compounds? Provide suitable examples. 5