

**THE CHARUTAR VIDYA MANDAL UNIVERSITY****M.Sc. (Organic Chemistry) – SEMESTER 4****APRIL 2023 (REGULAR) EXAMINATION****Course Title: Natural Products****Course Code: 101330401****Total Printed Pages : 02****Date: 18/04/2023****Time: 02.00 pm to 04.00 pm****Maximum Marks: 60****Instructions:**

- Attempt all questions.
- Numbers to the right indicate full marks for each question.
- Make suitable assumptions wherever necessary.

- Q.1** Answer the following multiple choice questions. (04)
- (I) Number of isoprene units present in sesquiterpenoids is \_\_\_\_\_.  
(a) 3 (b) 4 (c) 5 (d) 6
- (II) Hofmann exhaustive methylation involves loss of \_\_\_\_\_.  
(a)  $\alpha$ -hydrogen (b)  $\beta$ -hydrogen  
(c)  $\gamma$ -hydrogen (d)  $\delta$ -hydrogen
- (III) When conc.  $H_2SO_4$  and acetic anhydride is added to solution of Cholesterol in chloroform, it gives \_\_\_\_\_ colour.  
(a) green (b) blue (c) yellow (d) red
- (IV) \_\_\_\_\_ chiral centers present in Vitamin H.  
(a) 0 (b) 1 (c) 2 (d) 3
- Q.2** Answer in brief and to the Point (08)
- (I) Give the chemical evidences for the presence of ureide nucleus in Biotin
- (II) Discuss the functionality of oxygen atoms in Morphine.
- (III) Calculate the double bond equivalent for  $\beta$ -Carotene.
- (IV) Explain steps involved in Barbier-Wieland degradation.
- Q.3** (a) Give the chemical evidences for the presence of (06)
1. thioether functionality in Biotin.
  2. nature of oxygen atoms in Pyridoxine.
- (b) Write the synthesis of following. (06)
1. Vitamin-B<sub>6</sub>
  2. Vitamin-C
- OR**
- (b) Riboflavin upon reaction with sodium hydroxide in the presence of light (06) gives lumi-lactoflavin, Discuss the structure of lumi-lactoflavin. .
- Q.4** (a) Give evidences to prove that the nitrogen end of the nitrogen containing (06) bridge  $-CH_2-CH_2-N-CH_3$  is attached to C<sub>9</sub> or C<sub>10</sub> of the phenanthrene ring in Morphine.
- (b) Write the synthesis of following. (06)
1. Tylophorine
  2. Cincholoiponic acid
- OR**
- (b) Give the evidence for the point of linkage of quiloline part to the second (06) half in Cinchonine.

- Q.5** (a) Discuss Campbell and Soffer's work for establishing position of double bond in  $\alpha$ -Cadinene. (06)
- (b)  $\beta$ -Eudesmol upon sulphur dehydrogenation gives eudalene as one of the product. Discuss the structure of eudalene along with its synthesis. (06)

**OR**

- (b) Answer the following. (06)
1. Give the evidences for the symmetric structure of  $\beta$ -Carotene.
  2. Write the synthesis of  $\beta$ -Eudesmol.
- Q.6** (a) Give the evidence for the position of hydroxyl in Cholesterol. (06)
- (b) Give proof for the position of angular methyl groups present in Cholesterol. (06)

**OR**

- (b) Give the synthesis of the following. (06)
1. Oesterone
  2. Cortisone

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**THE CHARUTAR VIDYA MANDAL UNIVERSITY**  
**MASTER OF SCIENCE (ORGANIC CHEMISTRY) – SEMESTER 4**  
**APRIL 2023 (REGULAR) EXAMINATION**

**Course Title: Medicinal Chemistry**

**Course Code: 101330402**

**Total Printed Pages: 02**

**Date: 20/04/2023**

**Time: 2:00 pm to 4:00 pm**

**Maximum Marks: 60**

**Instructions:**

- Attempt all questions.
- Numbers to the right indicate full marks for each question.
- Make suitable assumptions wherever necessary.
- Draw the neat and clean diagram with pencil where it is needed.

- Q.1 Answer the following multiple choice questions. (04)**
- (I) When 'Renin' is released in human body? (04)  
(a) As temperature of the body decreases  
(b) As blood pressure decreases  
(c) As blood pressure increases  
(d) As temperature of the body increases
- (II) For an orally active drug, we have the data,  $F=0.80$ ,  $V_d=40L/70Kg$ ,  $t_{1/2e}=12$  hours,  $t_{1/2a}=1$  hour,  $MEC=10$  microgram/ml, and  $TC=25$  microgm/ml. Which of the following dose schedule is most effective and non-toxic for the patient?  
(a) 100 mg 3 times a day (b) 250 mg 3 times a day  
(c) 600 mg 4 times a day (d) 300 mg 4 times a day
- (III) Which of the following strategies is NOT used for lead optimization?  
(a) SAR study (b) Bio-isoelectric replacement  
(c) Do not change stereochemistry (d) functional group optimization
- (IV) Which of the following is / are correct sentence(s)?  
(i) Sedatives and Hypnotics do not produced sleep.  
(ii) Sedatives produced mild depression without causing drowsiness  
(iii) In emotion strain anti anxiety agents used  
(a) (i) & (ii) (b) Only (i) (c) (ii) & (iii) (d) Only (iii)
- Q.2 Answer in brief and to the Point. (08)**
- (I) Discuss any four routs of drug administration.
- (II) Draw a diagram and explain mix and split method of combinatorial synthesis of peptides.
- (III) Give the synthesis of Rimantadine.
- (IV) What are systolic and diastolic blood pressure? Explain the type of blood pressure based on its measurements.
- Q.3 (a) What are chemical messengers? Explain the signalling through neurotransmitters. (06)**
- (b) Answer the following. (06)  
(1) Discuss drug excretion.  
(2) Define receptor and discuss any two types of receptors.

**OR**

- (b) Answer the following. (06)  
(1) What is agonist? Discuss different types of agonists.  
(2) Discuss pharmacokinetics concept of drug with respect to time.

- Q.4** (a) What is antihypertensive drug? Give detail classification of antihypertensive drug. (06)  
(b) What are sedatives and hypnotics? List out the different classes of them and discuss SAR of Barbiturates in detail. (06)

**OR**

- (b) List out classes of antidepressant drug, discuss any one of them in detail and give the synthesis of Imipramine. (06)
- Q.5** (a) Define and classify antineoplastic agents. Give detail explanation of mustards. (06)  
(b) Compare virus and bacteria based on their structure, method of reproduction, types and the diseases caused by them and its treatment. (06)

**OR**

- (b) Answer the following. (06)  
(1) Define Antiviral drug, give its classification based on the treatment of protocol.  
(2) How COVID-19 is replicated?
- Q.6** (a) What is antibiotic? Give its classification. Discuss mode of action of drug which is inhibitor of protein synthesis for bacteria. (06)  
(b) Write a note of the following. (06)  
(1) Computer assisted drug design.  
(2) Gram (-ve) bacteria with its structure

**OR**

- (b) Answer the following. (06)  
(1) Give the synthesis and applications of cefuroxime.  
(2) Discuss the composition of peptidoglycan.

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# THE CHARUTAR VIDYA MANDAL UNIVERSITY

**M.Sc. (Organic Chemistry) – SEMESTER 4**

**APRIL 2023 (REGULAR) EXAMINATION**

**Course Title: Stereochemistry of Organic Compounds**

**Course Code: 101330403**

**Total Printed Pages : 02**

**Date: 24/04/2023**

**Time: 02.00 pm to 04.00 pm**

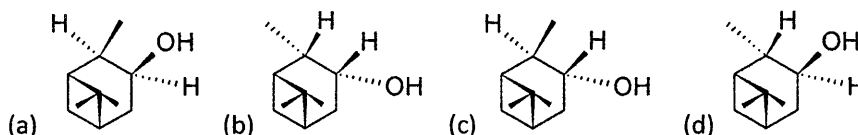
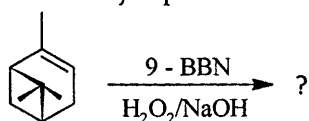
**Maximum Marks: 60**

**Instructions:**

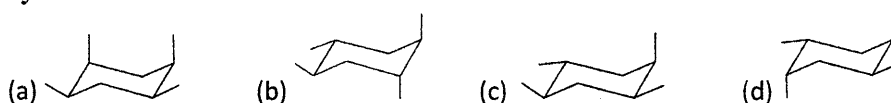
- Attempt all questions.
- Numbers to the right indicate full marks for each question.
- Make suitable assumptions wherever necessary.

**Q.1** Answer the following multiple choice questions. **(04)**

(I) What is the major product in following reaction?



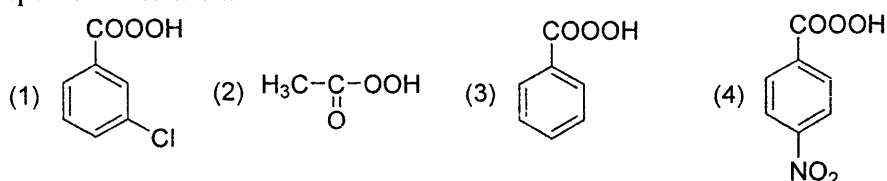
(II) Which of the following is the most stable conformer of 1,2,4,5-tetramethylcyclohexane?



(III) Which of the following characteristic is not correct for the resolving agents?

(a) readily available (b) unstable (c) low toxic (d) optically pure

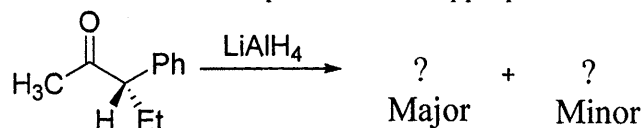
(IV) Arrange the following peracid in increasing order according to their rate of epoxide formation.



(a) 4>1>3>2 (b) 3>2>4>1 (c) 4>3>1>2 (d) 3>1>4>2

**Q.2** Answer in brief and to the Point **(08)**

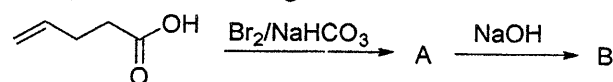
(I) Give the structure of products with appropriate mechanistic steps.



(II) Discuss the conformation analysis of n-pentane.

(III) Explain the pyramidal inversion via citing example of 1,3-dimethyl piperidine

(IV) Complete the following reaction with its mechanism.



**Q.3** (a) Illustrate the term chiral auxiliary; demonstrate the use of S-Proline and SAMP as chiral auxiliaries in asymmetric synthesis. (06)

(b) Write a note on Sharpless epoxidation. (06)

**OR**

(b) "Aldol condensation is a diastereoselective reaction" justify the statement. (06)

**Q.4** (a) Describe experimental method for resolution of racemic mixture of DL-Alanine. (06)

(b) Discuss the conformation analysis of n-propionaldehyde and meso-2,3-bromobutane. (06)

**OR**

(b) What is resolution? List the general methods for resolution and explain the resolution by chromatography technique. (06)

**Q.5** (a) Draw the conformations of the following. (06)

1. Cyclononane    2. Menthol    3. Hexachloro cyclohexane

(b) Write a note on 2-alkyl ketone effect, double anomeric effect and rabbit ear effect. (06)

**OR**

(b) Discuss the conformational analysis of 1-decalone and 9-methyl decalin. (06)

**Q.6** (a) Explain neighbouring group participation by heteroatoms and  $\pi$ -bond. (06)

(b) Answer the followings. (06)

1. Explain different methods for the epoxide ring opening with their mechanism.
2. Explain the stereochemistry of  $\text{S}_{\text{N}}1$  reaction.

**OR**

(b) Answer the followings. (06)

1. Explain the regioselectivity of elimination reaction.
2. Explain internal elimination reaction of ester.

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**THE CHARUTAR VIDYA MANDAL UNIVERSITY**  
**M.Sc.(ORGANIC CHEMISTRY) – SEMESTER 4**  
**APRIL 2023 (REGULAR) EXAMINATION**

**Course Title: Topics in Organic Chemistry**

**Course Code: 101330409**

**Total Printed Pages : 04**

**Date: 26/04/2023**

**Time: 02:00 pm to 04:00 pm**

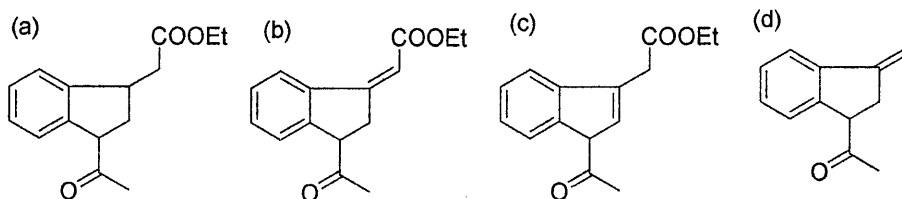
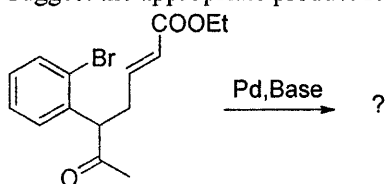
**Maximum Marks: 60**

**Instructions:**

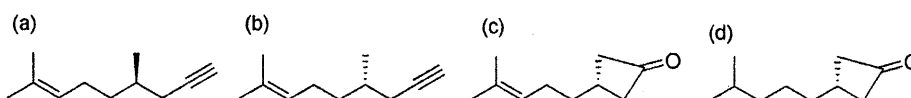
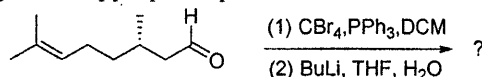
- Attempt all questions.
- Numbers to the right indicate full marks for each question.
- Make suitable assumptions wherever necessary.

**Q. 1** Answer the following multiple choice questions. **(04)**

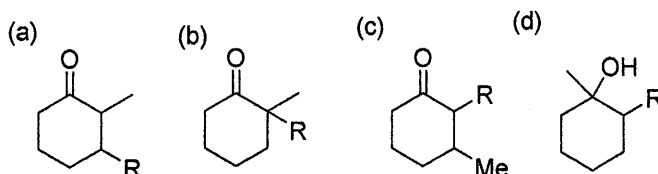
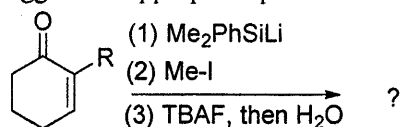
(I) Suggest the appropriate product for the following reaction.



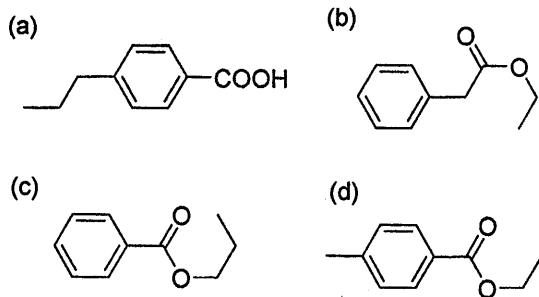
(II) Suggest the appropriate product for the following reaction.



(III) Suggest the appropriate product for the following reaction.

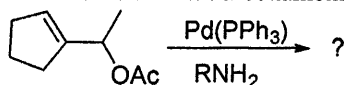


(IV) A compound with molecular formula  $C_{10}H_{12}O_2$  showed a strong IR band at  $1720\text{cm}^{-1}$ , a peak at  $m/z$  122 in the mass spectrum and the following  $^1\text{H-NMR}$  signal  $\delta$  8.1-8.0 (2H, m), 7.5-7.3 (2H, m), 4.3 (2H, t), 1.8 (2H, sextet) and 1.0 (3H, t). The structure of the compound is \_\_\_\_\_.

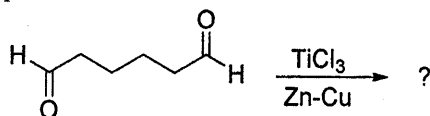


**Q.2** Answer in brief and to the Point. (08)

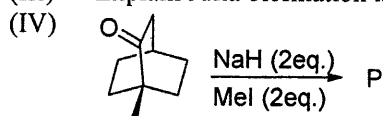
(I) Complete the reaction with mechanism.



(II) Complete the reaction with mechanism.



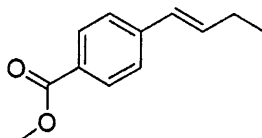
(III) Explain Julia olefination is stereo selective.



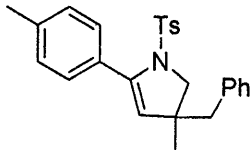
The number of peaks exhibited by the major product **P** in its broadband proton decoupled  $^{13}\text{C}$ -NMR spectrum are \_\_\_\_\_.

**Q.3** (a) Explain Oxidative addition, Reductive elimination and Migratory insertion. (06)

(b) (1) Select cross-coupling reaction that can produce product below. Explain the answer with mechanism. (06)



(2) Explain & introduce the reaction using catalytic cycle.

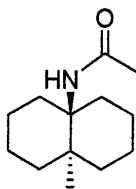


**OR**

(b) Explain the hydroformylation using catalytic cycle and Explain carbopalladation. (06)

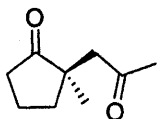
**Q.4** (a) Explain the Sharpless asymmetric dihydroxylation reaction with suitable example and catalytic cycle. (06)

(b) (1) Give the synthesis of following molecule by Ritter reaction with mechanism. (06)



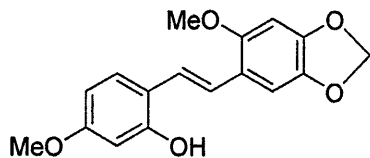


(2) Give the synthesis of following molecule by Nef reaction with mechanism.



OR

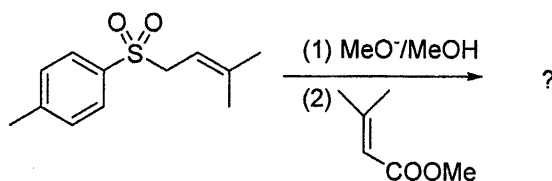
(b) (1) Give the synthesis of following molecule by McMurry reaction with mechanism. (06)



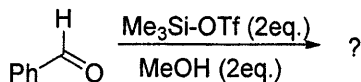
(2) Write a note on Luche reduction.

Q.5 (a) Complete the following reaction with mechanism. (06)

(1)

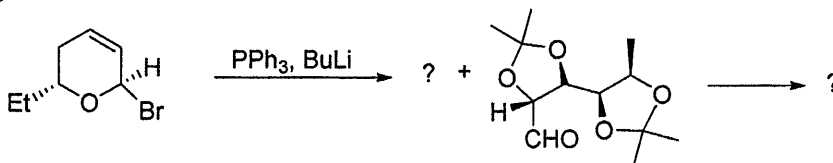


(2)

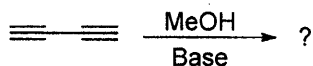


(b) Complete the following reaction with mechanism. (06)

(1)



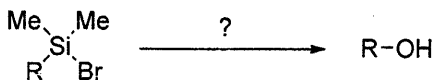
(2)



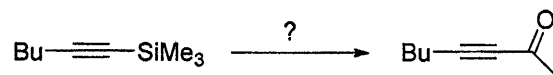
OR

(b) Complete the following reaction with mechanism. (06)

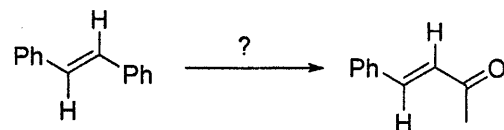
(1)



(2)

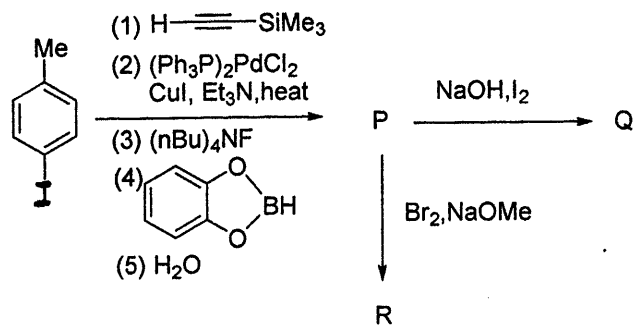


(3)

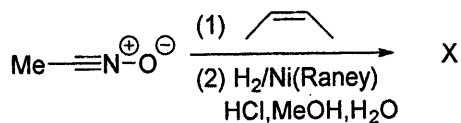


Q.6 (a) Complete the following reaction with mechanism. (06)

(1)

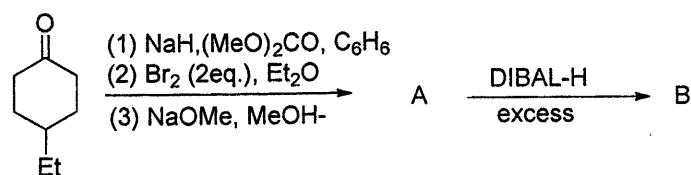


(2)

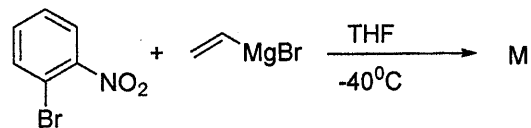


(b) Complete the following reaction with mechanism. (06)

(1)



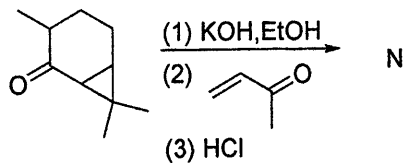
(2)



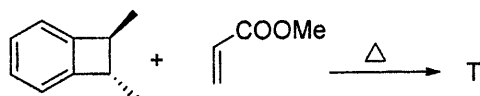
OR

(b) Complete the following reaction with mechanism. (06)

(1)



(2)



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