UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Second Semester – Spring 2023

Roll No. .....

Paper: Chemistry II Organic Chemistry **Course Code: CHEM-107** **Time: 3 Hrs.** **Marks: 60**

THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

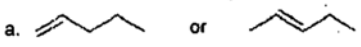
Q.1. Answer the following short questions: (15x2=30)

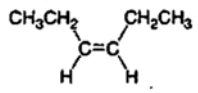
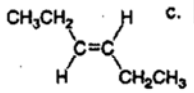
i. Draw the resonance structures of naphthalene.

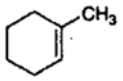
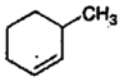
ii. Acetoacetic ester gives ferric chloride test which is typical test for phenol?

iii. Activating groups are ortho para directing, while deactivating are Meta directing?

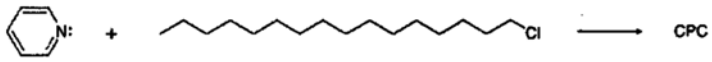
iv. Which alkene in each pair is more stable?

a.  or

b.  or 

c.  or 

v. CPC (cetylpyridinium chloride), an antiseptic found in throat lozenges and mouthwash, is synthesized by the following reaction. Draw the structure of CPC.



vi. Write down the mechanism of nitration in benzene

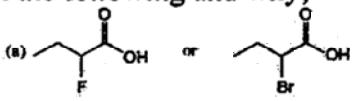
vii. Wurtz reaction is not suitable for tertiary alkyl halides, give reason?

viii. Define tautomerism with examples.

ix. Use the principles of resonance theory to explain why carbocation A is more stable than carbocation B.

x. Why carboxylate ion are more stable than the alkoxide ion?

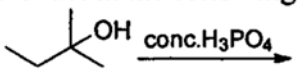
xi. Which is more acidic in the following and why;

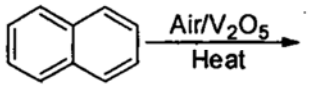


xii. Arrange the leaving groups from good to bad leaving group;

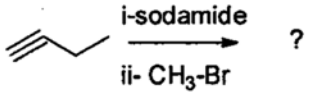
R-Cl, R-F, R-SO_3H, R-OH, R-H_2O^+

xiii. Expect the major and minor product in the following;

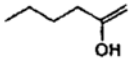


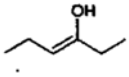


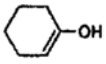
xiv. Identify the product;



xv. Draw the keto tautomer of each enol.

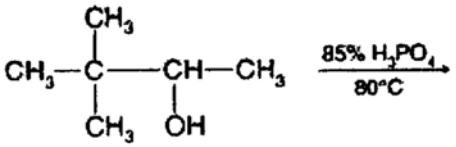
a. 

b. 

c. 

Answer the following questions:

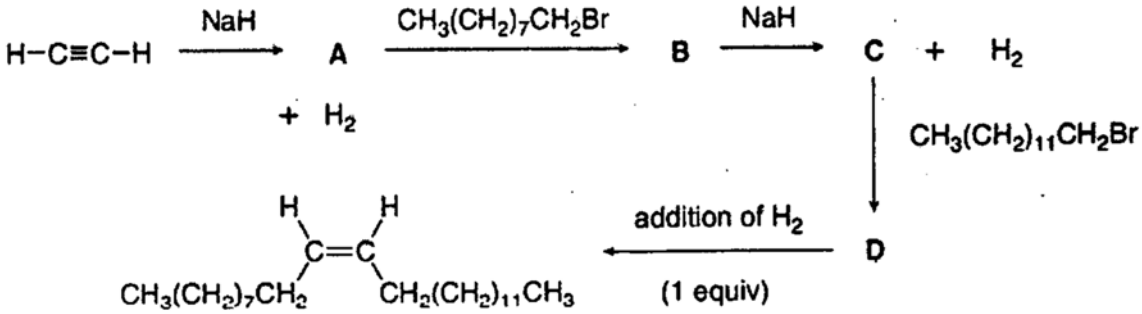
Q. 2. a) What is Reimer-Tiemann reaction explain with mechanism. (5)
b) Identify the major and minor products and explain the mechanism;(5)



3,3-Dimethyl-2-butanol

Q.3.a) Write two synthetic routs to synthesize naphthalene. (5)
b) Draw all the hyper conjugating structures of tertiary carbocation.(5)

Q.4.a) Muscalure, the sex pheromone of the common housefly, can be prepared by a reaction sequence that uses two nucleophilic substitutions. Identify compounds A–D in the following synthesis of muscalure. (5)



muscalure

b) Give the products that would be formed when each of the following alcohols is subjected to acid-catalyzed dehydration. If more than one product would be formed, designate the alkene that would be the major product. (5)