



GARISSA UNIVERSITY

UNIVERSITY EXAMINATION **2017/2018** ACADEMIC YEAR **ONE**
SECOND SEMESTER EXAMINATION

SCHOOL OF INFORMATION SCIENCE

FOR THE DEGREE OF BACHELOR OF COMPUTER SCIENCE

COURSE CODE: CHE 104e

COURSE TITLE: ORGANIC CHEMISTRY I

EXAMINATION DURATION: 3 HOURS

DATE: 10/04/18

TIME: 9.00-12.00 PM

INSTRUCTION TO CANDIDATES

- The examination has SIX (6) questions
- Question ONE (1) is COMPULSORY
- Choose any other THREE (3) questions from the remaining FIVE (5) questions
- Use sketch diagrams to illustrate your answer whenever necessary
- Do not carry mobile phones or any other written materials in examination room
- Do not write on this paper

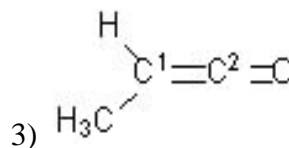
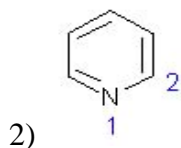
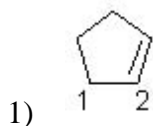
This paper consists of TWO(2) printed pages

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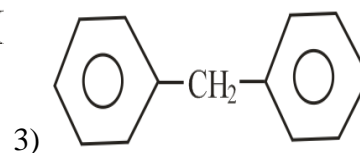
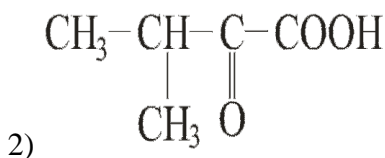
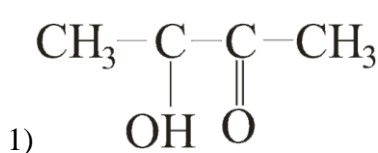


QUESTION ONE (COMPULSORY)

a) What are the hybridizations of atoms 1 and 2 respectively in the following structures? **[3 Marks]**



b) Using IUPAC nomenclature name of the following organic compounds (3 Marks)



c) Explain and write Wurtz reaction for preparation of alkanes? **[2 marks]**

d) Explain why Boiling points of isomeric alkanes goes on decreasing with increased branching **[2 marks]**

e) Why do alkenes undergo electrophilic addition and not electrophilic substitution reaction **[2 marks]**

f) Explain why Alkynes do not exhibit geometrical isomerism while alkenes do so **[2 marks]**

g) Describe the mechanism of nitration of chlorobenzene. **[3 marks]**

h) Why does benzene undergo electrophilic substitutions reactions easily and nucleophilic substitutions with difficulty **[2 marks]**

i) Explain why Solubility of alcohols in water decreases with increase in molecular mass of the alcohol **[2 marks]**

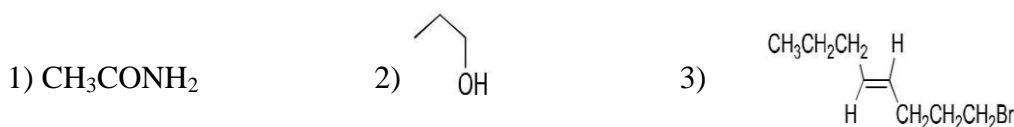
j) Why do Carbonyl compounds mainly show nucleophilic addition reactions? **[2 marks]**

k) How can you distinguish an alcohol and a carboxylic acid **[2 marks]**



QUESTION TWO

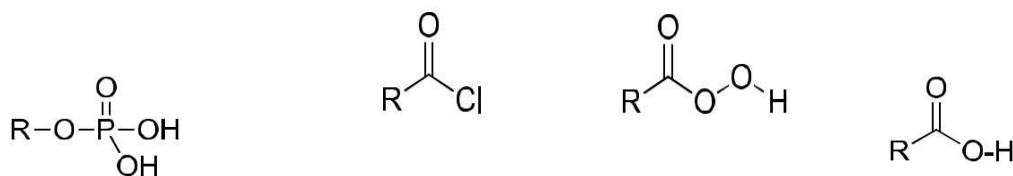
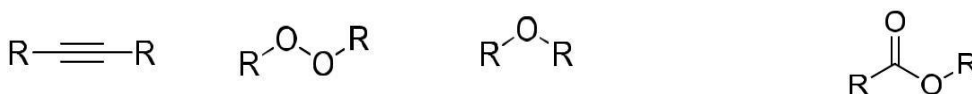
- a) Give two methods for the preparation of alcohols and give chemical equation for each preparation [4 marks]
- b) Why amines have lower boiling points than those of alcohols or carboxylic acids? [2 marks]
- c) Describe why the boiling point of an alkyl halide is higher than that of corresponding alkane [2 marks]
- d) Why do aldehydes and ketones have high dipole moments? [2 marks]
- e) Why do amines react as nucleophiles [2 marks]
- f) Name the following organic compounds using IUPAC nomenclature [3 marks]



QUESTION THREE

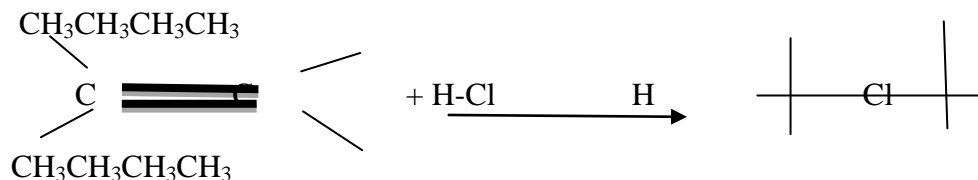
- (a) Name the classes of compound that the following molecules belong to (E.g. alkane, amide, etc)

[8 marks]



- (b) Explain the mechanism of the following addition reactions (including curve arrows)

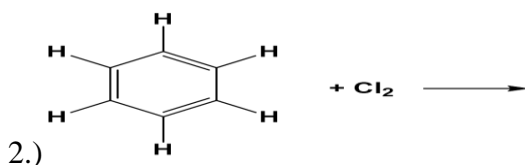
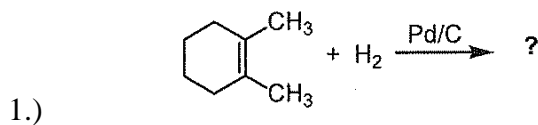
[7 marks]



QUESTION FOUR

a) Write the major product of the following reactions

[8 marks]



b) Draw and name two molecules that are structural isomers

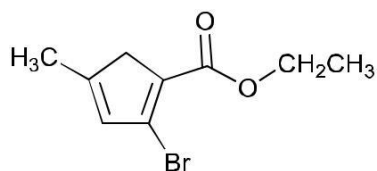
[4 marks]

c) Name two methods of preparation of carboxylic acids giving chemical reactions for each [3 marks]

QUESTION FIVE

(a) For the following molecule, calculate the number of

[7 marks]

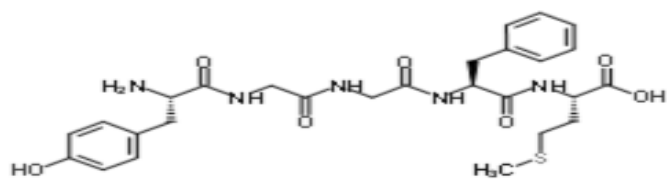


- i. Carbon atoms
- ii. π bonds
- iii. Sp² hybridized carbons
- iv. Sp hybridized atoms
- v. Lone pairs (non bonding pairs) of electrons
- vi. The C-O-C bond angle
- vii. Carbons in the ring

(b) Met-enkephalin, an endorphin serves as natural pain reliever that changes or removes the perception of nerve signals, Label all functional groups present in the structure below of met-enkephalin

[8 marks]

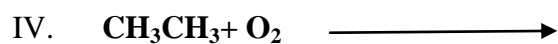
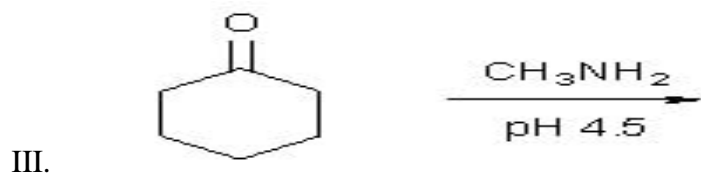
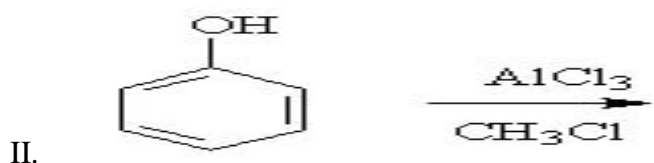
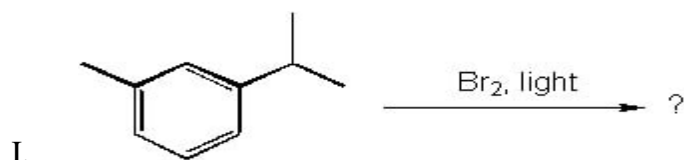




QUESTION SIX

(a) What is the major product of the following reaction?

[8 marks]



(b) Explain the mechanism and the product of the addition reaction below

[7 marks]

