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# KIBABII UNIVERSITY

UNIVERSITY EXAMINATIONS  
2017/2018 ACADEMIC YEAR

SECOND YEAR SECOND SEMESTER  
SUPPLEMENTARY EXAMINATIONS

FOR THE DEGREE OF B.ED (SCIENCE)

**COURSE CODE:** SCH 212

**COURSE TITLE:** BASIC ORGANIC CHEMISTRY

**DURATION:** 2 HOURS

**DATE:** 11/10/2018

**TIME:** 3-5PM

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## INSTRUCTIONS TO CANDIDATES

- Answer **QUESTION ONE** (Compulsory) and any other two (2) Questions.
- Indicate **answered questions** on the front cover.
- Start every question on a new page and make sure question's number is written on each page.

This paper consists of 4 printed pages. Please Turn Over



KIBU observes ZERO tolerance to examination cheating

### QUESTION ONE (30 MARKS)

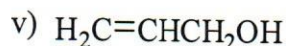
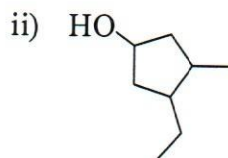
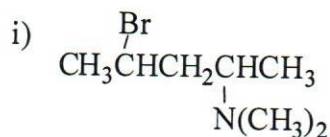
a) Draw the structures of the following compounds (5 marks)

i) 1,1,2-trimethylcyclopentane ii) propan-1-ol

iii) diethylamine iv) 2-butene

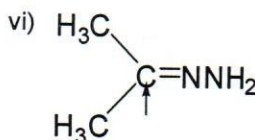
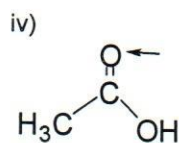
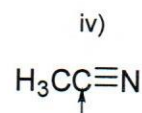
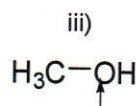
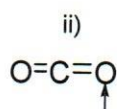
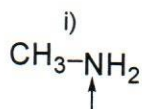
v) 2-chlorohex-3-yne

b) Give the IUPAC names of the following (5 marks)



c) Draw the trans and cis isomers of  $\text{C}_4\text{H}_8$  and give their names (3 marks)

d) What is the hybridization of the indicated atom in each of the molecules below (3 marks)



e) Which of the following molecules have a dipole moment of zero? (3 marks)



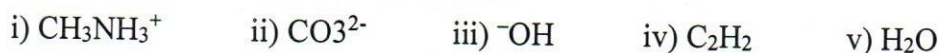
f) Draw the condensed structures of a compound that contains only carbon and hydrogen atoms and that has:

i) Three  $\text{sp}^3$  hybridized carbons (1 mark)

ii) One  $\text{sp}^3$  hybridized carbon and two  $\text{sp}^2$  hybridized carbons (1 mark)

iii) Two  $\text{sp}^3$  hybridized carbons and two  $\text{sp}$  hybridized carbons (1 mark)

g) Draw Lewis structures of the following: (5 marks)



h) Arrange the following alkyl halides in order of decreasing reactivity in an  $\text{S}_\text{N}1$  reaction



- ii) trigonal planer
- iii) trigonal pyramidal
- iv) tetrahedral
- v) linear

**QUESTION FOUR (20 MARKS)**

a) Draw the E and Z isomers of the following molecules.

**(6 marks)**

- i) 1-bromo-2-chloropropene
- ii) 2-bromo-3-chlorobutene
- iii) 1,2-dichloroethene

b) Draw Lewis structures for the four alcohols with molecular formula  $C_4H_{10}O$ . Classify each as a  $1^\circ$ ,  $2^\circ$  or  $3^\circ$  alcohol and give their names **(8 marks)**

c) Which of the following carbocations would you expect to rearrange? Show and name the types of rearrangements that lead to products **(6 marks)**

