ARANMORE CATHOLIC COLLEGE
YEAR 12 CHEMISTRY - 2012
TEST: ORGANIC CHEMISTRY

NAME: _____ **DATE:** _____

Test

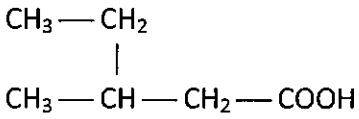
Score

INSTRUCTIONS

1. Time Allowed: 50 minutes
2. Total marks: **50 marks**
3. Part 1 is to be answered on the Multiple Choice Answer Sheet provided.
4. Parts 2 and 3 are to be answered on the question paper.
5. A Chemical data sheet is provided.
6. Graphics calculators are permitted.

PART 1 **MULTIPLE CHOICE** **[5 Marks]**

1. What is the systematic name for the following?

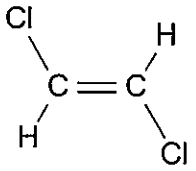


(a) 3-ethylbutanoic acid
(b) 2-methylpentanoic acid
(c) 3-methylpentanoic acid
(d) 1,2-dimethylbutanoic acid

2. Which of the following would not be expected to decolourise an acidified potassium permanganate solution?

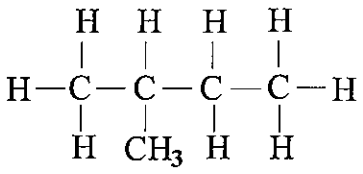
(a) CH_3OH
(b) CH_3CH_2OH
(c) CH_3CH_2CHO
(d) CH_3COCH_3

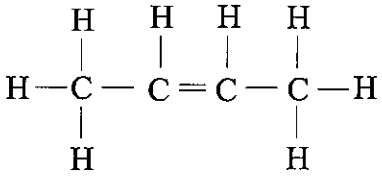
3. The structure drawn here represents one of the isomers of formula $C_2H_2Cl_2$. What is the total number of isomers possible for $C_2H_2Cl_2$?

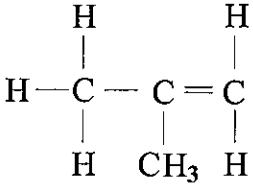


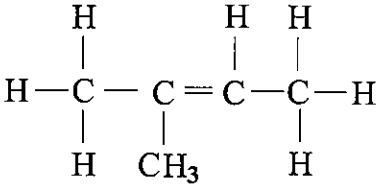
(a) 1
(b) 2
(c) 3
(d) 4

4. Which of the following molecules is a structural isomer of 3-methyl-1-butene?

(a) 

(c) 

(b) 

(d) 

5. Which of the following structures represents a tertiary alcohol?

(a) $(CH_3)_3COH$
(b) $CH_3CH_2CHOHCH_3$
(c) $CH_3CH_2CH_2CH_2OH$
(d) $CH_3CH_2CH_2C(OH)_3$

PART 2: **SHORT ANSWER**

6. For each of the following reactions **draw** the structural formula and write the IUPAC **name** of the major organic product you expect to form.

a) 2-butanol and acidified potassium permanganate Name:
b) 1-propanol and acidified potassium dichromate Name:
c) 1-pentanol and propanoic acid with concentrated sulfuric acid Name:

(6 marks)

7. Butan-1-ol has a boiling point of 117^{O}C while butan-1-amine boils at 78^{o}C. Explain.

(4 marks)

8. For each of the following pairs of solutions describe a simple **chemical** test that could be used to distinguish between the two substances. State the observation that you would make with each solution.

Pairs of Solutions	Describe the Test	Observation for each
2-methyl-2-propanol and 1-butanol		
ethanoic acid and ethanal		

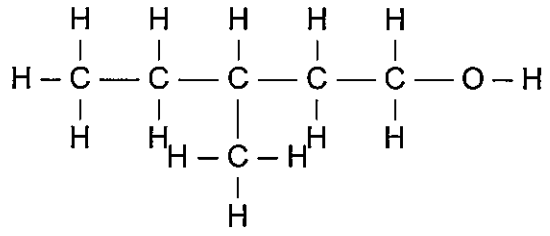
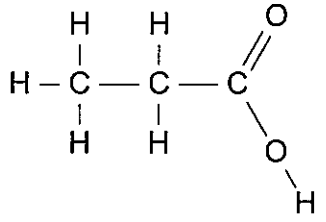
(4 marks)

9. Draw the structure of each of the following:

2-methylbutanal	
ethylmethanoate	

(2 marks)

10. Give the IUPAC name of the following structures.

(2 marks)

PART 3: **2 Extended answers** **[20 Marks]**

11. Citric acid, is a carboxylic acid responsible for the sour taste of lemon juice, contains only carbon, hydrogen and oxygen.

1.383 g of anhydrous (dry) citric acid is burned in dry oxygen to give 1.900 g of CO_2 and 0.518 g of H_2O.

a. Calculate the empirical formula of citric acid.

(7 marks)

b. 3.84 g of citric acid vaporized at 150 ^{o}C was found to occupy 0.700L at 100.0 kPa. Determine the molecular formula of citric acid.

(3 marks)

c. Given that one mole of citric acid reacts with three moles of potassium hydroxide, suggest a structural formula for citric acid.

(2 marks)

12. Show with the aid of diagrams how ethanol is soluble in water but not in ethane.

(8 marks)

END OF PAPER