NAME: ……..……..

SCHOOL:……

DATE: .....

ORGANIC CHEMISTRY 2

INSTRUCTIONS TO CANDIDATES

*Answer **ALL** questions in this paper in the spaces provided.*

1. Explain how a sample of CH_3CH_2OH could be distinguished from a sample of CH_3COOH by a chemical test (2mks)

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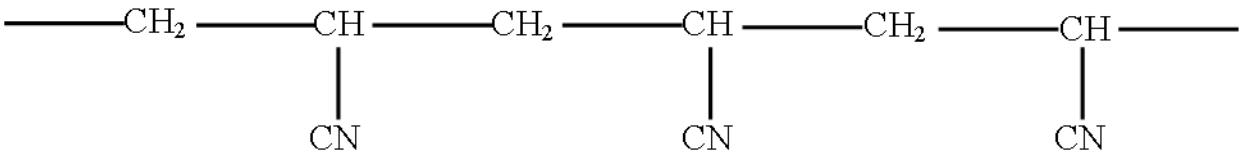
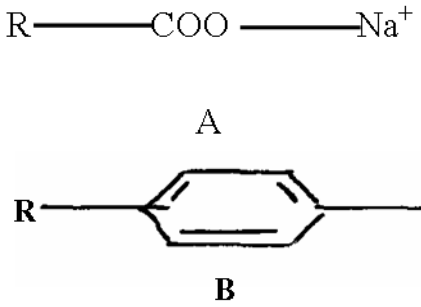
2. A polymer has the following structure



A sample of this polymer is found to have a molecular mass of 5194. Determine the number of monomers on the polymer (H = 1.0, C = 12.0, N = 14.0)

(2mks)

3. The structure shown below represent two cleansing agents A and B.



A

B

Which cleansing agent would be more suitable for washing in water containing magnesium sulphate? Explain (2mks)

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4. (a) **Draw** the structural formulae of propane and propan - 2- ol (2marks)

Propane: Propan – 2 – ol:

(a) **Give** the chemical test for distinguishing propane from propene. (1mark)

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5. An organic compound **G** whose empirical formula is HCO_2 has molar mass of 90. It reacts with ethanoic in the presence of a few drops of concentrated sulphuric (VI) acid forming another compound J with a pleasant smell.

(a) **Determine** the molecular formula of compound G

(2marks)

(b) **To which** class of homologous series do compound **G** and **J** belong?

G: ……

J: ……

6. In a reaction, an alcohol J was converted to hex-I-ene.

(i) Give the structural formula of the alcohol J. (1mk)

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(ii) Name the reagent and conditions necessary for the reaction in (i) above. (2mks)

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7. The boiling points of the first six alkanols are given in the following table.

No of atoms	1	2	3	4	5	6
Boiling points ^{0}C	64	78	97	117	132	154

a) What conclusion can be drawn from the information given in the table above. (1mk)

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b) The boiling points of the first six alkanes are much lower compared to those of the alkanols given in the above table. Explain. (1mk)

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c) Give the name of the alkanol with five carbon atoms. (1mk)

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8. a) What is vulcanization of rubber? (1mk)

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b) State two properties that vulcanized rubber possesses as a result of vulcanization.

(2mks)

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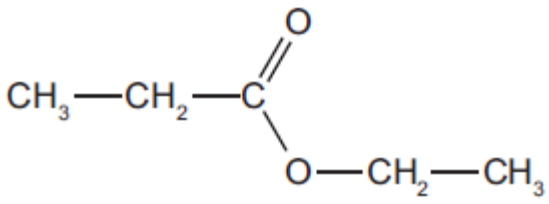
9. Hydrolysis is used in chemistry to break down complex molecules into simpler ones.

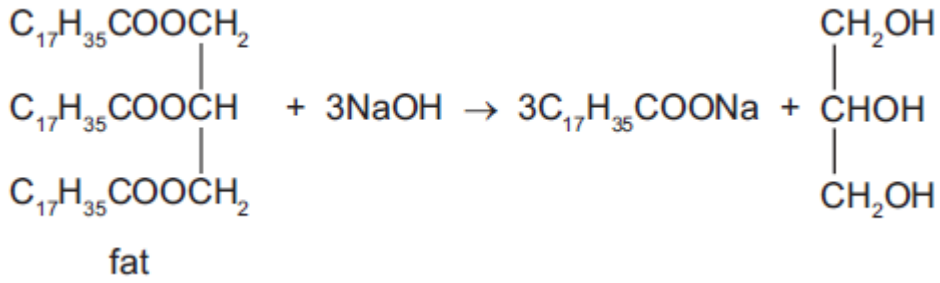
(i) Give the names and formulae of the two compounds formed when the ester ethyl propanoate is hydrolysed.



Name ..... name.....

Formula formula

(ii) Fats are naturally occurring esters. They can be hydrolysed by boiling with aqueous sodium hydroxide.



What type of compound has the formula $C_{17}H_{35}COONa$ and what is its main use?

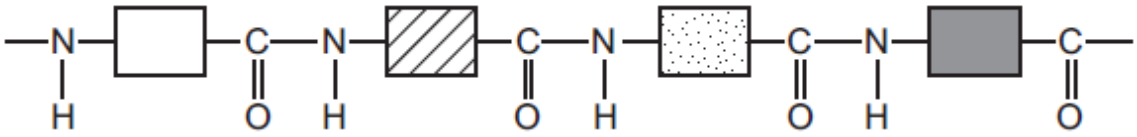
Type of compound..... [1]

Use..... [1]

(iii) Name a synthetic polyester.

..... [1]

(b) The structure of a typical protein is drawn below.



(i) What is the name of the polymer linkage?

..... [1]

(ii) Draw the structural formula of a man-made polymer with the same linkage.

[3]

(iii) A protein can be hydrolysed to a mixture of amino acids which are colorless. Individual amino acids can be identified by chromatography. The *R*f value of the amino acid glycine is 0.5. Describe how you could show that glycine was present on a chromatogram.

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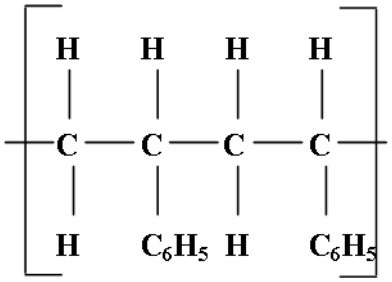
..... [3]

[Total: 14]

10. The following is a small section of polystyrene polymer. Study it and answer the questions that follow.



(a) Draw the structure of the monomer unit of polystyrene. (1mk)

(b) Calculate the number of monomers used to form the polystyrene polymer of relative molecular mass of 18,096. (H=I=, C=12)

(2mks)