Technical University of Mombasa

Faculty of Applied and Health Sciences

DEPARTMENT OF **PURE AND APPLIED SCIENCES**

DIPLOMA IN ANALYTICAL CHEMISTRY
(DAC 10M)

ACH 2307 : ORGANIC CHEMISTRY III

SPECIAL/SUPPLEMENTARY: EXAMINATIONS
SERIES: FEBRUARY 2013
TIME: 2 HOURS

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INSTRUCTIONS:

You should have the following for this paper
-   *Answer booklet*
This paper consists of *FIVE* questions.
Answer Question **ONE (compulsory)** and any other **TWO** questions
This paper consists of 3 PRINTED pages

Question ONE

a) Describe the main characteristics of step growth polymerization   **(5marks)**
b) Give two examples of
    (i)   Condensation polymer
    (ii)   Addition polymer
                                                  (4marks)
c) Describe vulcanization process of rubber   **(5marks)**
d) State the main advantages of vulcanized rubber over natural rubber.   **(6marks)**
e) Briefly explain what you understand by tacticity and illustrate by simple diagrams tacticity of

polystyrene.   **(10marks)**

Question TWO

a) Define functionality and give example of a polymer that is formed by monomers with a

functionality of 2 and 3 include their structures.   **(9marks)**
b) Briefly explain what you understand by the following
    (i)   Biodegradable
    (ii)   Natural polymer
    (iii)   Synthetic polymer
                                                  (3marks)
c) Give examples of
    (i)   Natural
    (ii)   Synthetic
                                                  (8marks)

Question THREE

Discuss any FIVE factors that affect Ig of a polymer.   **(20marks)**

Question FOUR

a) State the precursors (ingredients) of the following types of industrial polymerization processes.
(i)   Suspension
(ii)   Bulk
(iii)   Emulsion
(iv)   Solution
                                                  (7marks)
b) What are the advantages and disadvantages of suspension industrial polymerization process.

      (11marks)
c) List an example of a stabilizer that is used in suspension polymerization and draw its structure.

      (3marks)

Question FIVE

a) The concentration of cholesterol dissolved in $CHCl_3$ is 6.15g per 100ml. A solution of the above

solution is put into a 5cm polarimeter tube causing observed rotation of -200.
Calculate
(i)   Its specific rotation   **(2marks)**
(ii)   Predict its observed rotation if the same solution is placed in a 10cm tube. **(2marks)**
(iii)   Predict observed rotation if 10ml of this solution is diluted to 30ml and placed in a 20cm

        tube.   **(3marks)**
b) Define the following terms.
(i)   A plane polarized light
(ii)   Enantiomer
(iii)   Recemic mixture
(iv)   Diastereomer

                                                                                                        (6marks)
c) (i)   Draw conformation isomers of n Butane and name them.   **(3marks)**
(ii)   Discuss their stability with respect to one another.   **(4marks)**