Technical University of Mombasa

Faculty of Engineering Technology

DEPARTMENT OF **BUILDING AND CIVIL ENGINEERING**

DIPLOMA IN BUILDING AND CIVIL ENGINEERING
(DBCE)

ACH 2140: CHEMISTRY

SPECIAL/SUPPLEMENTARY: EXAMINATIONS

SERIES: DECEMBER 2012

TIME: 2 HOURS

<u>**INSTRUCTIONS:**</u>

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) Differentiate between addition and condensation polymerization. **(8marks)**
b) State SEVEN properties of rubber that make it a good material for construction. **(7marks)**
c) Give TWO examples of polymer that is made by
    (i)   Condensation polymerization
    (ii)   Addition polymerization **(4marks)**
d) Indicate the monomers that are used in the above (IC) examples of polymers **(6marks)**
e) Define
    (i)   Monomer
    (ii)   Polymer
    (iii)   Polymerization
    (iv)   Covalent bonding
    (v)   Homopolymer. **(5marks)**

Question TWO

a) Give an example of a monomer that has a functionality of 1,2 and 3 **(6marks)**
b) (i)   What do you understand by tacticity
   (ii)   Using PVC explains THREE types of tacticity **(10marks)**
c) State TWO conditions for H-bond formation. **(4marks)**

Question THREE

a) Explain the trends of the following periodic table properties across a period and down a group
    (i)   Atomic size
    (ii)   Ionic Size
    (iii)   Electronegativity
    (12marks)
b) State and explain three factors that influence formation of low **(8marks)**

Question FOUR

a) Give FIVE methods that can be used to prevent failure of a paint film **(5marks)**
b) State TEN characteristics of a good paint. **(10marks)**

Question FIVE

a) State THREE properties of
    (i)   Acids
    (ii)   Bases
    (6marks)
b) 80g of NaOH was mixed with excess H_2SO_4 acid
    (i)   Calculate mass of Na_2SO_4 that is formed after complete reaction.
    (ii)   What name is given to this type of reaction
             (RAM of   Na-23g O-16g H - 1g S- 32g) **(5marks)**
c) Write equation for reaction of rain water with atmospheric carbon dioxide. **(2marks)**

d) The product obtained in C above was passed though a rock containing $CaCO_3$
    (i)   Write equation to show how it will react with $CaCO_3$. **(2marks)**
    (ii)   What would be pH range of solution obtain in C(i) above
e) (i)   State TWO requirements for a rusting process of iron. **(2marks)**
    (ii)   Give equation for the initial process of rusting of iron. **(1mark)**