**MOI UNIVERSITY**

OFFICE OF THEDEPUTY VICE CHANCELLOR

(ACADEMIS, RESEARCH AND EXTENSION)

**UNIVERSITY EXAMINATIONS 2016/2017 ACADEMIC YEAR**

FIRST YEAR FIRST SEMESTER EXAMINATION

**FOR THE DEGREE OF**

**BACHELOR OF EDUCATION**

**IN**

**TECHNOLOGY EDUCATION**

**COURSE CODE:**  TEC 111

**COURSE TITTLE:**  CHEMISTRY FOR TECNOLOGIES

**INTRUCTION TO CANDIDATES**

ANSWER QUESTION ONE ANSWER ANY TWO QUESTIONS

1

1. Give any characteristics of protons (2mks)
2. Calculate the mass that is lost when an atom of cabon-12 is formed from protons, electrons and neutrons (3mks)
3. List all the possible values of *l* and *m* for n=2 (3mks)
4. State the Pauli’s exclusive principle (1mk)
5. Write down the electron configuration and give their respective blocks of the following elements: S and Ca (Atomic numbers: S=16, Ca=20 (3mks)
6. Esters are known for their sweet smells. Draw the structure of methyl butanoate and state its use (3mks)
7. What is the basic difference between a chemical and refinery process (2mks)
8. What is cracking? Give two operating conditions for cracking (4mks)
9. Differentiate between glass and ceramics (2mks)
10. Polymers can be classified according to their properties, discuss the elastomers (3mks)
11. Describe how vulcanized rubber is formed from the isoprene units and give its advantage over ordinary rubber (5mks)

2

1. Define the term atomic orbital (1mk)
2. State any four characteristics of cathode rays (4mks)
3. Give atomic number, mass number and chemical representation of tritium, an isotope of hydrogen (2mks)
4. Write notes on principle of quantum number “n” (3mks)
5. Wrie any four quantum numbers for each electron in nitrogen atom (4mks)
6. Magnesium has three significant natural isotopes: 78.70% of all magnesium atoms have an atomic weight of 23.985 a.m.u, 10.13% have an atomic weight of 24.986 a.m.u and 11.17% have an atomic mass weight of 25.983 a.m.u. how many protons and neutrons are present in each of these three isotopes? What is the average weight of the atomic weight? (4mks)
7. Give two defects of Bohr’s theory (2mks)

3.

* 1. State the modern periodic table law (1mk)
  2. Give four characteristics of transition metals (4mks)
  3. Draw the Lewis structure for
     1. Fe3(PO4)
     2. NO3-  (2mk)
  4. Illustrate how SP3d1 hybridization accur (PCL5) and account for its shape (4mks)
  5. Water is unusual in its ability to form an extensive hydrogen bonding network. (5mks)
  6. Explain
  7. State two properties of metalloids (2mks)

4

1. Give any two unique characteristic of carbon in orraganic chemistry (2mks)
2. Name the following organic structures

1. Give any four main materials used in the manufacture of Portland cement (2mks)
2. What are the main advantages of catalytic cracking over thermal cracking? (2mks)
3. Give four examples of copolymers (2mks)
4. Distinguish between block copolymer and graft copolymer (2mks)
5. Quiana is a synthetic polymer that can be used to make fabric that mimics the texture of silk. It can be prepared from the following monomers
   1. Draw the structure of Quiana? (1mk)
   2. Is Quiana a poyster, a polyamide, a polycarbonate or a polyurethane? (1mk)
   3. Is Quiana a step-growth polymer or a condensation polymer? (1mk)
   4. Is Quiana an addition polymer or a condensation polmer? (1mk)
6. Using condensation polymerization explain how Poly (ethylene terephthalate)(PET)is formed (4mks)