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**University Examinations 2016/2017**

FIRST YEAR, FIRST SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN PUBLIC HEALTH AND BACHELOR OF SCIENCE IN COMMUNITY HEALTH AND DEVELOPMENT

**SCS 3110: GENERAL CHEMISTRY**

**DATE: December, 2016 TIME: HOURS**

**INSTRUCTIONS:** *Answer questions* ***one*** *and any other* ***two*** *questions.*

**QUESTION ONE - (30 MARKS)**

1. Define atomic number. (1 Mark)
2. Name the subatomic particles and indicate their changes. (3 Marks)
3. What are isotopes. Give an example. (2 Marks)
4. How many valence electrons does each of the following atoms have? (2 Marks)
5. Na
6. Cl
7. (i) State three characteristics of metals. (3 Marks)

(ii) What are chemical bonds? (1 Mark)

1. Draw the Lewis structure of methane. (2 Marks)
2. Define the term Electronegativity. (1 Mark)
3. Define the term acid and base as per Broston and Lowrly. (2 Marks)
4. Name the functional group of each of the following compounds; (2 Marks)
5. Ethene
6. Ethanol
7. What is a buffer solution? Give an example. (2 Marks)
8. Name the following organic compounds;

  (1 Mark)

  (1 Mark)

  (1 Mark)

1. Complete the equation below; (1 Mark)

 

1. What is radioactivity? (1 Mark)
2. Write a balanced chemical equation for the reaction of propanol with aluminium metal.

(3 Marks)

1. Write the electron configuration of Ca. (1 Mark)

**QUESTION TWO (20 MARKS)**

1. Illustrate hydrogen bonding using water molecule as an example. (4 Marks)
2. Discuss applications of Radioisotopes under the following subheadings; (16 Marks)
3. Biomedical research
4. Medicine
5. Radiotherapy
6. Biochemical analysis

**QUESTION THREE (20 MARKS)**

1. Explain three importance of hydrogen bonding. (6 Marks)
2. By use of equations explain three methods of preparing alkynes. (12 Marks)
3. Complete the equation below;

 $CH\_{3}CH\_{2}$OH + $H\_{2}SO\_{4}$ $\rightarrow $ (1 Mark)

1. What is the name given to the process indicated by the equation in (c) above.(1 Mark)

**QUESTION FOUR (20 MARKS)**

1. Discuss periodic trend in electron affinity and electron affinity down the group and across a period. (6 Marks)
2. Explain the meaning of conjugate acid-base pairs using an example. (6 Marks)
3. Discuss safety measures that one should observe when working with radioactive materials in the laboratory. (8 Marks)