MACHAKOS UNIVERSITY

University Examinations for 2021/2022

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF MECHANICAL AND MANUFACTURING ENGINEERING

FIRST YEAR FIRST SEMESTER EXAMINATION FOR

CRAFT CERT ELECTRICAL & ELECTRONICS

1601/102/ASAPPLIED SCIENCE

DATE: **TIME:**

INSTRUCTIONS

Answer all questions

INSTRUCTIONS:

a) Write your Registration Number in the Answer Booklet

b) Answer all questions

1. a) i) Describe the difference between strong acid and a concentrated acid, weak acid and a dilute acid (4 marks)

ii) Outline the nature particles in a compounds, mixtures and elements (2 marks)

iii) Tabulate the differences between mixtures and compounds (8 marks)

iv) Write the molecular and ionic equation for the reaction between dilute Hydrochloric Acid and Zinc (4 marks)

v) State with a reason, the type of reaction in 1 (a (iv)) above (2 marks)

2. a) Briefly explain the meaning of the following properties of metals (6 marks)

i. Malleability

ii. Ductility

iii. Conductivity

b) i) Write the list of elements as they appear in the electrochemical series (6 marks)

ii) Using Chlorine and Sodium show how atoms react by electron transfer (3 marks)

c) Explain how polarity occurs in chemical molecules (5 marks)

3. a) With examples describe monoprotic, diprotic and triprotic acids (3 marks)
   b) Describe a laboratory activity to demonstrate that the water molecule is electrically charged (6 marks)
   c) Using a diagram describe how laboratory preparation of Silver Chloride (5 marks)
   d) Write a balance equation for the reaction between; (6 marks)
      i) Iron and Copper (II) Sulphate
      ii) Calcium Carbonate and Sulphuric Acid
      iii) Water and Sodium

4. a) i) Differentiate between a normal and an acid salt (2 marks)
      ii) Using sulphuric acid write two equations to show the formation of the t wo salts in 4(a) above (4 marks)
   b) How is the universal indicator different from normal acid-base indicator? (3 marks)
   c) Describe how the pH scale works (5 marks)
   d) Using diagrams, outline how ionic, covalent and hydrogen bonds occur (6 marks)

5. a) Briefly explain the difference between a Solution, a Suspension and a Colloid (6 marks)
   b) Outline the procedure that you would follow to separate a mixture of water, kerosene, sodium chloride and sand (9 marks)
   c) What is ionization energy and how does it relate to the size of atoms? (5 marks)