



MACHAKOS UNIVERSITY

University Examinations 2020/2021 Academic Year

SCHOOL OF PURE AND APPLIED SCIENCES

DEPARTMENT OF PHYSICAL SCIENCES

FIRST YEAR SECOND TERM EXAMINATION FOR
CERTIFICATE IN ELECTRICAL & ELECTRONICS ENGINEERING

1601/102/AS: APPLIED SCIENCE

DATE: 3/9/2021

TIME: 8.30-10.30 AM

INSTRUCTIONS:

Answer all questions

1.
 - a) Briefly, describe the Periodic Table of Elements (4 marks)
 - b) Define a molecule (2 marks)
 - c) State the differences between elements and compounds (4 marks)
2.
 - a) Briefly explain the meaning of the following properties of metals (6 marks)
 - i. Malleability
 - ii. Ductility
 - iii. Conductivity
 - b) State how metallic bonding influences the three properties in 2 a), above (2 marks)
3.
 - a) List elements as they appear in the electrochemical series (6 marks)
 - b) Write the molecular equation for the reaction between Hydrochloric Acid and Zinc metal (2 marks)
 - c) With a reason state the type of reaction in 3(b) above (2 marks)
4. Using Chlorine and Sodium show how atoms react by electron transfer (3 marks)
5.
 - a) Briefly explain the meaning of polarity in chemical molecules (4 marks)
 - b) With illustration using the water molecule, describe how hydrogen bonding occurs. (5 marks)
6. Using an appropriate example in each case describe the following: -
 - a) Metallic bond (3 marks)
 - b) Covalent bond (3 marks)
 - c) Ionic bond (3 marks)

7. Copy and complete the following table (9 marks)

Element	Atomic No (Z)	Atomic Mass (M)	No. Of Protons	No. of Neutrons	No. of Electrons	Electronic configuration
U	17	35				
V		16				
W		39		19		
X		40				

- a) Describe the circumstances that lead to the existence of Isotopes (4 marks)
- b) Name any two (2) isotopes and draw their atomic structure (2 marks)
8. Outline the main differences between Chemical and Physical Change (4 marks)
9. a) Explain why Sodium Chloride dissolves in water but not in kerosene (4 marks)
- b) Write a balance chemical equation for the reaction between Sulphuric Acid and Sodium Hydroxide (4 marks)
10. With examples, describe the type particles found in compounds, elements and mixtures (9 marks)
11. Briefly explain the difference between a Solution, a Suspension and a Colloid (6 marks)
12. Outline the procedure that you would follow to separate a mixture of water, kerosene, sodium chloride and sand (9 marks)