



# MACHAKOS UNIVERSITY

University Examinations 2016/2017

SCHOOL OF PURE AND APPLIED SCIENCES

DEPARTMENT OF PHYSICAL SCIENCES

FIRST YEAR SECOND SEMESTER EXAMINATION FOR  
CERTIFICATE IN ELECTRICAL AND ELECTRONICS ENGINEERING  
CERTIFICATE IN MECHANICAL ENGINEERING  
CERTIFICATE IN CIVIL ENGINEERING  
SUPPLEMENTARY EXAMINATION  
BCE BT 101- APPLIED SCIENCE II CHEMISTRY

DATE: 1/9/2017

TIME: 2:00 – 4:00 PM

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## INSTRUCTIONS:

Answer Question One and Any Other Two

1. Calculate:

a) Total number of atom present in:

i.  $6 \text{C}_{12}\text{H}_{22}\text{O}_{11}$

ii.  $4 \text{Ba}(\text{HCO}_3)_2$  (4 marks)

b) Number of protons, neutrons and electrons in potassium and chlorine.

Element	Atomic Number	Atomic Mass
Potassium	19	39
Chlorine	17	37

(4 marks)

2. Draw a diagram to show the possible structure of an atom containing 12 neutrons and has atomic number 11. (3 marks)
3. Use dots and crosses to show how element X atomic number 12 combines with element Y atomic number 9 to form a compound. (3 marks)
4. a) Define valency. (1 mark)
- b) Element P has atomic number 1 and Q has atomic number 7. Give 3 properties of the compound formed when P combines with Q. (3 marks)
- c) State the valences of P and Q. (2 marks)
5. a) Complete the table below.

Particle	No. Electrons	No. Neutrons	No. Protons	Mass Number
P <sup>2+</sup>	–	12	12	–
Q	35	45	–	–
R <sup>-</sup>	18	–	–	32
S	–	–	13	27

(8 marks)

- b) Write down the electronic arrangement of P<sup>2+</sup> using s p d f orbitals. (2 marks)