UNIVERSITY OF MINES AND TECHNOLOGY, TARKWA

SECOND SEMESTER EXAMINATIONS, MAY 2018

COURSE NO: **MR 172**
COURSE NAME: **MINERAL CHEMISTRY**
CLASS: **MR I** TIME: **3HRS**

Name**:** _____Index Number: _____

ANSWER ALL QUESTIONS

1. a) How did Rutherford arrive at his planetary model using JJ Thompson's Plum Pudding Model? (**5 marks**)

   b) Explain the modern view of an atom (**5 marks**)

   c) Explains Bohr's atomic model and its application (**5 marks**)

   d) List and explain the **four** main quantum numbers (**5 marks**)

2. a) Explain the following terms

   (i) Heterogeneous Equilibrium
   (ii) Homogeneous Equilibrium
   (iii) Vapour Pressure
   (iv) Activation Energy
   (v) Reaction Quotient
   (vi) Transition State
   (vii) Dipole
   (viii) Dispersion Force
   (ix) Dipole Force
   (x) Solubility Product of Equilibrium (2 marks each)

   b) Decide whether a precipitate of **$BaSO_4$** will be formed when **50 cm^3** of **0.0010 M $BaCl_2$** solution is mixed with **450 cm^3 of 1.0 x 10^{-5} M Na_2SO_4** solution. (**10 marks**)

3. Write notes on the following terms

   a) Electrical Double Layer (**5 marks**)

   b) Contact Angle and Wettability (**5 marks**)

   c) Stern Graham Model (**5 marks**)

   d) Gouy Chapman Model (**5 marks**)

   e) Helmholtz Model (**5 marks**)

   f) Zeta Potential (**5 marks**)

4. a) Explain the Collision Theory (**5 marks**)

   b) Explain the practical ways that the rate of a chemical reaction can be increased. (**5 marks**)

   c) Explain the role of catalyst in a chemical reaction (**5 marks**)

   d) Compare and Contrast covalency and electrovalency (**5 marks**)

Examiners: Dr. E. A. Agorhom/*Dr. S. Asare-Asher*