

**KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY, KUMASI  
COLLEGE OF SCIENCE**

**B.Sc. (Biological Sciences, Environmental Science), Semester Two, 2019/2020  
Year Four**

**BIOL 452 BIODIVERSITY UTILIZATION & CONSERVATION**

- 1a. Why do scientists consider *ex-situ* conservation methods as “insurance policy” for biological diversity? [5 points]
- b. *In-situ* conservation methods such as the creation of national parks, forest reserves, etc. are often preferred to *ex-situ* methods. What is the main reason for this preference? [5 points]
2. What are the main implications of the following theories for the establishment of a forest reserve?
  - i) Island Biogeography Theory [5 points]
  - ii) Metapopulation Theory [5 points]
3. The KNUST Botanic Garden is generally considered to be made up of three habitat types due to perceived differences in the composition of the plant species. An ecologists decided to test this hypothesis by collecting data on the plant species present in the garden and determining their diversity using the Whittaker Diversity Index. After analysis of the data, the researcher obtained an index value of 1.4. Use the information provided to answer the following questions:
  - a) what information does this value give about the number of plant communities or habitats in the Botanic Garden?

- b) the environmental conditions (particularly climate) that prevail in the KNUST Botanic Garden?
- c) sensitivity of the species to the prevailing environmental conditions?
- d) What type/level of biodiversity measurement is the Whitaker Diversity Index, and under what conditions is its use appropriate?
- e) If the use of the Whitaker Diversity Index was not appropriate for the study described above, mention the level of measurement which would have been more appropriate.