KENYATTA UNIVERSITY

UNIVERSITY EXAMINATIONS 2009/2010

INSTITUTIONAL BASED PROGRAMME (APRIL SESSION)

EXAMINATION FOR THE DEGREE OF MASTER OF EDUCATION

ECT 529: DESIGN AND METHODS IN CHEMISTRY

DATE: THURSDAY 2ND SEPTEMBER 2010 TIME: 9.00 A.M. - 12.00 P.M.

INSTRUCTIONS: Answer any three questions.

1. "The process of development and instruction of science knowledge and chemistry in particular can be through induction and deduction." As shown in the given diagram.

   (a) Outline the main steps used to 'accept' a chemical law.

   (b) Comment on the statement that "most instructional procedures in our schools follow the deductive approach.

(c) With examples from the school chemistry syllabus, distinguish between a law and a theory.

(d) What are the main differences in approach when teaching a chemical law and a theory at school level?

(23 marks)

2. A Resource plays an important role in the learning of chemistry.
   (a) Give the process that explains the role of a resource in chemistry instruction.
   (b) Using a chart as a resource: outline the qualities of a 'good' chart for chemistry instruction.
   (c) When teaching a topic "allotropes of carbon" teacher (A) uses charts and Teacher (B) uses models. Determine which teacher has made the better choice.
   (d) Apart from having a choice of a chart or a model to teach the topic on "allotropes of carbon", suggest another possible resource.

(23 marks)

3. Micro-kits are becoming a common instructional resource in chemistry. Compare the use of micro-kits and a conventional chemistry laboratory under the following headings.
   (a) The storage of chemicals
   (b) The economy in the use of chemicals
   (c) The diversity in experimental design
   (d) The rate of working on experiments

(23 marks)

4. "Molecular models form a valuable resource when teaching chemistry at school level." Discuss,
   (a) The suitable type of model you would recommend to be used at:
      (i) Form two level
      (ii) Form four level

(b) The main characteristics of a suitable model for chemistry instruction.

(c) Some key parts (topics) of the chemistry syllabus can receive improved instruction using molecular models.

(d) The main problems teachers face when acquiring molecular models.

(23 marks)

5. Explain the following using suitable examples.

(a) There are <u>two</u> patterns of storing chemicals in a laboratory and both have similar advantages.

(b) Using molecular models requires a careful choice to relate the <u>type</u> of model and the <u>level</u> of learners at school.

(c) There are advantages of improvisation of a range of instructional resources by chemistry teachers.

(d) Developing countries like Kenya have made some effort in producing some resources for chemistry teaching.

(23 marks)

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