

**UNIVERSITY OF SWAZILAND****FACULTY OF EDUCATION****MAIN EXAMINATION PAPER 2005****B. Ed. III AND PGCE F/T**

**Title of paper :** Curriculum Studies in Chemistry

**Course number :** EDC 379

**Time allowed :** 3 hours

- Instructions :**
1. This paper contains SIX questions
  2. Question 1 is COMPULSORY. You may then choose ANY THREE questions from questions 2, 3, 4, 5 and 6
  3. Each question is worth 25 marks
  4. Any piece of material or work which is not intended for marking purposes should be clearly CROSSED OUT
  5. Ensure that responses to questions are NUMBERED CORRECTLY

**Special Requirements**

Chemistry Section of the O' Level Science (Physics/Chemistry) syllabus  
Chemistry Textbook

**THIS PAPER SHOULD NOT BE OPENED UNTIL PERMISSION HAS BEEN GRANTED BY THE INVIGILATOR**

## QUESTION 1

**This question is compulsory.**

Teachers who succeed in their teaching generally organise themselves and writing out detailed schemes of work and daily lesson plans for their instruction.

- a) Prepare a detailed **two-week** scheme of work on the topics 5: Ionic bonding and topic 6: covalent bonding (see attached syllabus). Remember that six, forty-minute lessons per week are recommended for science subjects. [15]
- b) Describe **three** benefits of preparing a detailed scheme of work for science teaching. [6]
- c) What key pre-requisite concepts should learners have to be able to understand the concepts dealt with in the two topics given in (a) above? [4]

## QUESTION 2

- a) *By adding to the range of teaching techniques, learning experiences and relevant starting points we provide, we will engage interest and motivation of a wider range of pupils. There are also many peripheral reasons why girls in particular opt out of science. (Versey, 1990: 10).*
- i) What might teachers do regarding the following that could engage the interest and motivation of girls in a chemistry class?
- a) Teaching techniques.
  - b) Learning experiences.
  - c) Relevant starting points. [9]
- ii) What peripheral reasons might be responsible for girls opting out of science? Explain your answer. [9]
- b) *Throughout the world there is growing realization that the science presently taught is not relevant.... (Clark, 1997:62)*
- In what ways might a science curriculum be considered “not relevant”? [7]

### QUESTION 3

- a) *Any curriculum innovation has its goals and objectives. Implicit in such goals and objectives is the assumption that desirable goals are feasible.* (Ogunniyi, 1997: 11)
- i) What does “innovation” in curriculum development mean? [2]
  - ii) Besides the identification of objectives, what other **three** main processes take place in curriculum development? [3]
  - iii) Briefly describe what each of the three processes referred to in 3 a) (ii) above involves, indicating how each one is linked to the rest of the curriculum development processes. [9]
- b) Discuss the importance of involving the following stakeholders when developing a school science curriculum.
- i) learners
  - ii) parents
  - iii) employers
  - iv) teachers [11]

### QUESTION 4

Resources are an important addition to science equipment and apparatus in the teaching of science.

- a) What do you understand by a “teaching resource”? [3]
- b) Discuss the contributions teaching resources might add to facilitating a science lesson. [10]
- c) Suppose you have access to atomic models and an overhead projector at *your school*. Describe **two** strengths of **each one** of these resources for teaching concepts in O’ level organic chemistry topics (see syllabus provided). Use specific examples of concepts to illustrate your points [12]

### QUESTION 5

In an article on *Student understating of ionic bonding: molecular versus electrostatic framework* Taber (1997), concludes that;

“.... *Alternative conceptions about ionic bonding are widespread among learners who have been taught about chemical bonding at school or college.*” (p. 94).

- a) What might be the source(s) of pupils' misconceptions in chemistry? [4]
- b) What strategies might a chemistry teacher use to identify misconceptions that pupils may possess? [6]
- c) Suppose the following misconception was found to be prevalent among Form 4 pupils.  
*Covalent bonds are broken when a substance changes its state.*  
 Discuss, with the help of (an) appropriate example(s), how you might assist these pupils develop the appropriate conception regarding chemical bonds and the change of state. [5]
- d) The following strategies can be useful in helping pupils learn chemical concepts:  
 i) Analogies  
 ii) Advance organisers.  
 Explain, with the help of examples, how **each** of these strategies might facilitate concept development during the teaching of chemistry. [10]

### QUESTION 6

The language of instruction plays an important role in concept development. However, the use of a second language for instruction may cause learning problems for many pupils.

- a) What language related problems might be experienced by learners when learning science in the English language? [12]
- b) What might be the,  
 i) benefits and  
 ii) limitations  
 of using siSwati as a language of instruction for chemistry? [13]