

UNIVERSITY OF SWAZILAND

FACULTY OF EDUCATION

MAIN EXAMINATION PAPER

B. Ed. III/PGCE

May 2015

Title of paper: Curriculum Studies in Chemistry

Course number: EDC 379

Time allowed: 3 hours

Instructions:

1. This paper contains FIVE questions.
2. Answer Question 1 and then choose and answer **any three** questions from Questions 2, 3, 4 and 5.
3. Marks for each question are indicated at the end of the question.
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**
6. The examination paper comprises three pages and a two-page attachment

Special Requirements

Two support sheets labelled:

For Question 1(a)

For Question 1(b)

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

QUESTION 1

This question is compulsory

- a) Attached is a practical activity: *Activity 5.5 Investigating water pollution* that may be carried out by a Form 3 class. The syllabus details on the topic are also attached.
- i) Suggest a sub-topic for a lesson that may include the practical activity referred to in (a) above. [1]
 - ii) Describe **two** resources you might use to support learning during the lesson referred to in (a) (i) above. [4]
 - iii) Discuss how the attached activity demonstrates relevance of school science. [10]
- b) Attached is Question 12 that has been taken from a Physical Science examination paper, together with the corresponding examiners' comments on candidates' responses to the question.
- Infer from the examiner's comments possible language related problems the candidates that responded to the attached question might have had? [10]

QUESTION 2

- a) What functions do concepts play in the teaching and learning of Chemistry? [10]
- b) Learning Chemistry can sometime be challenging for learners.
- Discuss **five** aspects of Chemistry you may consider to be the sources of chemistry learning challenges for learners. [15]

QUESTION 3

“Having more women scientists, and having them in positions of responsibility, is important, and not merely to achieve equity... We must therefore strengthen the role of women in mainstream science and technology.” (O’Connor, 2003: 173).

Discuss O’Connor’s statement to reflect the following aspects:

- Why it is important to have more women scientists in positions of responsibility
- The challenges that have to be overcome
- The role of chemistry teachers in promoting women participation in science fields

[25]

QUESTION 4

The language of instruction plays an important communicative role in learning Chemistry. However, learners in Swaziland may experience problems in learning Chemistry in English- a second language, as well as with the language of Chemistry.

- a) Using relevant examples, describe the communicative role of the language of instruction in the teaching and learning of chemistry
[6]

- b) Discuss the challenges learners may experience from:

- Learning chemistry in a second language (English) [8]
- The language of Chemistry [11]

QUESTION 5

Curriculum evaluation in an important aspect of curriculum development

Discuss evaluation and its role in the development of a Science curriculum. [25]

For Question 1(a)

5. Organisms in Their Natural Environment

Learners should be able to:

- (a) list the three features which enabled life on earth-water, air and energy
- (b) state that the Sun is the principal source of energy to all living systems
- (c) describe linear feeding relationship of organism in a given habitat
- (d) Introduce collecting equipment, nets, quadrants along with basic rules to be followed when collecting specimens recording of data
- (e) Define-Ecology, habitat/ecosystems
- (f) Identify the major vegetation on earth and its global distribution using an atlas (Tropical Rain Forests, Grassland Deserts, Coniferous Forest)
- (g) describe the use and misuse of fertilizers and pesticides
- (h) state the human activities which bring about pollution: motor car exhaust, industrial/household smoke, dust from industries, Insecticides, fertilizers, Litter-plastics, non rotting wastes
- (i) define conservation as sustainable use of non-renewable and renewable resources

Activity 5.5 Investigating water pollution

You will need the following materials for your investigation: beaker or jam jar, red and blue litmus paper.

1. Visit a local river or stream where people fetch water.
 - (a) Find out if there are any activities nearby to the water source that may lead to pollution. Record your observations.
 - (b) Is the water clean? Explain your answer.
2.
 - (a) Half fill a beaker with the water from your source. Test the water with blue and red litmus paper and record your results.
 - (b) What conclusions about the purity of the water can you draw from your results?
 - (c) Look more closely at the water in the beaker. Does it look as clean as it did from a distance? Take some of this water to school and observe it using a hand lens or microscope.
 - (d) Do you think the water is pure? Explain your answer.
 - (e) Do you think this water is fit for drinking? Explain.
3.
 - (a) Describe another way of finding out whether the water is pure.
 - (b) What would be the result of your findings?

ACTIVITY



For Question 1(b)

14

12 Fig. 12.1 is a flow diagram that shows the reaction of the hydrocarbon ethene.

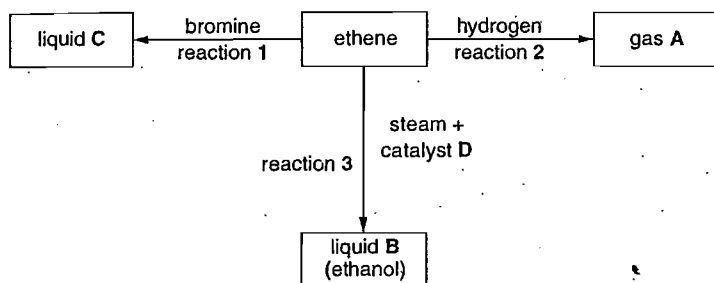


Fig. 12.1

(a) Name

- (i) gas A,
- (ii) liquid C,
- (iii) catalyst D, [3]

(b) State the use of reaction 1 in organic chemistry.

..... [1]

(c) Liquid B (ethanol) can also be prepared by using another method known as fermentation.

Briefly describe fermentation, including the symbol equation for fermentation.

..... [3]

For
Examiner's
Use

Question 12

(a) Fairly done. Most responses were irrelevant names for the letters.

Correct response: A - ethane;
B - dibromoethane;
C - phosphoric acid;

(b) The most common responses were "testing for alkanes and alkenes", "testing for ethane", "testing for ethane".

Correct response: test for saturation/alkenes/C-C double bonds/ double bonds in hydrocarbons.

(c) Most candidates described home fermentation (tibiliso) without reference to scientific concepts/ content. Some mentioned that yeast would react with sugar. A few candidates mentioned that the sugar decomposed or used the already made ethanol. Most of the equations were not balanced. Some candidates used the word equation for the description.

Correct response: -starch source;
-enzymes involved;
-final equation;
 $C_6H_{12}O_6 \longrightarrow 2C_2H_5OH + 2CO_2$