

**UNIVERSITY OF SWAZILAND**  
**FACULTY OF EDUCATION**  
**SUPPLEMENTARY EXAMINATION PAPER**  
**B. Ed. II/PGCE**  
**July 2015**

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

**Course number:** EDC 279

**Time allowed:** 3 hours

**Instructions:**

1. This paper contains FIVE questions.
2. You may choose and answer ANY FOUR questions.
3. Each question is worth 25 marks
4. Marks for each sub-question are indicated at the end of the question.
5. Any piece of material or work that is not intended for marking purposes should be clearly **CROSSED OUT**.
6. Ensure that responses to questions are **NUMBERED CORRECTLY**.
7. This paper comprises three printed pages

**Special Requirements NONE**

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

## QUESTION 1

Refer to the Junior Certificate Science Syllabus 414 section on *Topic 10: Non-metals* below to respond to the questions that follow.

JC SCIENCE Syllabus 414  
October/November 2015 Examination

### 10. Non-Metals

All learners should be able to:

- (a) describe the approximate composition of air (21% oxygen, 0.03% carbon dioxide, 78% nitrogen, and remainder being mixture of noble gases and water vapour).
- (b) prepare and collect hydrogen.
- (c) describe the properties of hydrogen.
- (d) describe the test for hydrogen using a lighted splint.
- (e) state the use hydrogen as a fuel in rockets.
- (f) prepare and collect oxygen by the method of heating potassium permanganate.
- (g) describe the properties oxygen.
- (h) describe the test for oxygen using a glowing splint.
- (i) state the uses of oxygen including its use in hospitals and with acetylene in welding.
- (j) describe combustion.
- (k) describe the conditions necessary for rusting to occur.
- (l) describe methods of rust prevention: paint and other coatings to exclude oxygen.
- (m) prepare and collect carbon dioxide.
- (n) describe the properties of carbon dioxide.
- (o) describe the test for carbon dioxide using lime water.
- (p) state the uses of carbon dioxide in fire extinguishers, fizzy drinks and baking.
- (q) list physical properties of water: melting point, boiling point and density.

- a) Formulate a sub-topic for a possible lesson from this topic [2]
- b) Construct an outline of activities that could be carried out by the pupils and by the teacher for a lesson on the sub-topic formulated in (a) above. [10]
- c) What processes of science and scientific knowledge might learners acquire while performing the activities presented in (b) above. Give specific examples of the elements of science developed. [7]
- d) Write two questions you could use either during the lesson or after the lesson to check for pupils' understanding of learned material. [6]

## QUESTION 2

- a) Discuss the issues to be considered when stating objectives for chemistry instruction. [8]
- b) Suppose you want to use the demonstration method to teach concepts related to the preparation and properties of oxygen as indicated in the learning outcomes f, g and h in *Topic 10: Non-metals*. (See syllabus section provided in Question 1 above).  
What might be the advantages of using the demonstration method for teaching the concepts referred to in learning outcomes f, g and h? [5]
- c) Science is an integral component of the school curriculum. Justifications for teaching science have been viewed in terms of its development of pupils' **affective, cognitive, physical and interpersonal abilities**.  
Show with clear justifications how science fulfils the development of the identified pupils' abilities. [12]

### QUESTION 3

Selecting the most appropriate method for teaching a specified content area is an important step in lesson planning.

- a) State, and justify, **three other** factors that may determine the choice of teaching method for a lesson. [6]
- b) State, and show clearly, what method of teaching you might consider appropriate for teaching the content shown in the following section of the SGCSE Physical Science (6888) Syllabus. [10]

<i>Core</i>	<i>Extended</i>
<i>C6 Stoichiometry</i>	- <i>Deduce the balanced equation of a chemical reaction given relevant information</i>
- ...	- <i>Calculate stoichiometric reacting masses and volumes of gases and solutions, solution concentrations expressed in mol/dm<sup>3</sup> or g/dm<sup>3</sup> (Calculations based on limiting reactants may be set.</i>
- ...	

- c) How might you ensure maximum learning benefit when using the method identified in (b) above? [9]

### QUESTION 4

- a) How might the following factors affect learner motivation to learn chemistry?
- i) Subject matter [6]
- ii) Teacher preparation for lesson [6]
- iii) Role models [5]
- b) Frequently practical work is perceived to lead to, and maintain, learner motivation in Science lessons, however, sometimes practical work fails to motivate learners (Hodson, 1990).

Briefly discuss the reasons why practical work may fail to motivate learners to learn Chemistry. [8]

### QUESTION 5

- a) Describe the approaches used in assessing experimental and investigative skills in SGCSE Physical Science. [15]
- b) Critique these approaches, showing their strengths and weaknesses for Swaziland. [10]