

**UNIVERSITY OF SWAZILAND**  
**FACULTY OF EDUCATION**  
**SUPPLEMENTARY EXAMINATION PAPER 2012**  
**B.Ed. II and PGCE**

**May 2012**

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

**Course number:** EDC 279

**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. Marks for each question or sub-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**.

**Special Requirements**

**SGCSE Physical Science Syllabus 6888 - 2011-2012**

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

## QUESTION 1

**This question is compulsory**

Suppose a teacher used the attached activity for a chemistry lesson on Rates of Reactions. (See UNIT 6.3 attached )

- a) What aim might the teacher have for the lesson? [1]
- b) State three learning outcomes that might be achieved from engaging in the activity? [6]
- c) Modify the activity to focus on exploring the effects of temperature on the rate of a reaction. [12]
- d) Show, with justification how a class may be organised to explore the effects of temperature on rate of reaction. [3]

## QUESTION 2

Two of the aims intended by the SGCSE Physical Science syllabus are

1. *To provide through well designed experimental and practical science, a worthwhile educational experience for all students, whether or not they go on to study science beyond this level and, in particular, to enable them to acquire sufficient understanding and knowledge to:*
  - 1.1 *be suitably prepared for studies beyond SGCSE level in pure sciences, in applied sciences or in science-dependent vocational courses.*
2. *To develop abilities and skills that*
  - 2.3 *are necessary to communicate scientific findings of practical investigations using proper technical scientific terminology.*

(SGCSE Physical Science Syllabus 6888 2011-2012, p4).

With the aid of illustrative examples from the syllabus, **discuss** your views regarding the fulfilment of these aims by the SGCSE Physical Science Syllabus. (See SGCSE Syllabus 6888 provided). [25]

### QUESTION 3

- a) It is usually advisable for teachers to employ varied types of questions when using the question and answer method in teaching. Questions used in the question and answer method may be classified as **convergent**, **divergent** or **evaluative** questions.

Describe the characteristics of each of the three classes of questions and give **two** examples for each type of question from Chemistry. [15]

- b) Discuss standard practical work as a method of teaching chemistry. [10]

### QUESTION 4

Identify and discuss **FOUR** factors that may affect learners in a chemistry class. [25]

### QUESTION 5

- a) Describe and justify an approach you could use to assess a learner's ability to "*make and record observations, measurement and estimates*" (JC Science 2005:9). [5]

- b) Assessment in national science examinations is norm referenced at the junior secondary school level while it is criterion referenced for SGCSE Physical Science.

Contrast criterion referenced assessment and norm referenced assessment, showing the strengths and challenges of using them in national examinations. [10]

- c) Discuss the use of alternative to the practical in in the national examinations for SGCSE Physical Science. [10]

### QUESTION 6

- a) "*Failing to plan for a lesson is planning to fail in teaching the lesson*"

Comment on the statement. [8]

- b) What are the reasons for outlining the following in a scheme of work?

i) Teaching material

ii) Date and Time in number of periods [7]

- c) What is the role of student teaching practice in teacher education? [10]

# UNIT 6.3

In this unit you will learn about factors that affect the rate of any chemical reaction. There are fast reactions such as the burning of wood or the explosion of dynamite or the reaction of potassium metal and water. There are slow reactions such as ripening of fruit or maturing of cheese or rusting of iron which may take months. The table below shows some common reactions and the time they take:

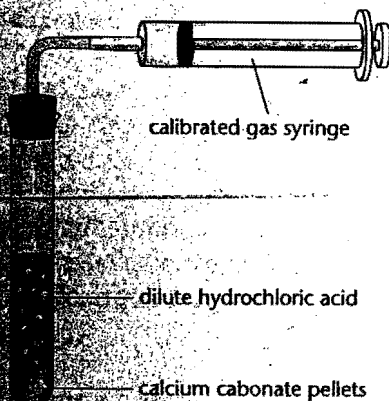
Reaction time	Common examples
seconds	reaction between liquid hydrogen and liquid oxygen, which is used to propel rockets
minutes	oxidation of calcium metal in air
hours	burning of coal in a fire
days	dulling of brass or copper
weeks	rusting of steel
years	yellowing of old documents

The speed at which chemical reactions occur is called the rate of reaction. The study of rates of reaction is called **chemical kinetics**. This is very important in industry. To make profits the yield must be high and the products must be made in a short time. The rate of a reaction is the speed of a reaction. This is usually found by plotting graphs as shown in the next activity.

## Measuring the volume of carbon dioxide released in a chemical reaction

You will need:

stop watch; dilute hydrochloric acid; calcium carbonate pellets; calibrated gas syringe



### Determining the rate of CO<sub>2</sub> gas

Do the following:

1. Set up the apparatus as shown.

2. Start the clock as soon as the reaction begins.

3. Read the volume of gas produced every half minute.

Here are the results obtained by another learner.

Time (minutes)	0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0
Volume of CO <sub>2</sub> (cm <sup>3</sup> )	0	15	24	28	31	33	35	35	35	35	35