

UNIVERSITY OF ESWATINI
FACULTY OF EDUCATION
RE-SIT EXAMINATION PAPER
PGCE-FT/IDE-PGCE

March 2021

Course Code/Title of paper: CTE529 Curriculum Studies in Chemistry I
IDE-CTE529 Curriculum Studies in Chemistry I

Time allowed: 3 hours

Instructions:

1. This paper contains FIVE questions.
2. Question 1 is COMPULSORY. You may then choose and answer ANY THREE questions from Questions 2, 3, 4, 5.
3. Marks for each question and sub-question are indicated at the end of each question/sub-question.
4. Any piece of material or work that is not intended for marking purposes should be clearly **CROSSED OUT**.
5. Ensure that responses to each question have the same number as the question and are not intercepted by responses to other questions.

Special Requirements Information sheets:

Appendix I: EGCSE Physical Science Syllabus section

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

QUESTION 1

This question is compulsory

- a) While teaching Chemistry a teacher used the equation given below:



- i) Suggest a **topic** and a **sub-topic** for a lesson the teacher might be teaching. [2]
 - ii) What is missing from this equation? [2]
 - iii) Write **three** learning outcomes for the teacher's lesson so that different cognitive levels of Bloom's taxonomy are represented. [6]
 - iv) Write **one structured** assessment item (question) worth **5 to 10 marks** for assessing learning from the lesson **and** include a marking guide for the item. [5]
- b) Standard practical is one approach that can be used to conduct practical work in Chemistry lessons.

Discuss this approach to practical work *and* show its strengths and weaknesses in teaching Chemistry. [10]

[25]

QUESTION 2

Science, as a discipline, has characteristics that enable its teaching to fulfil the development of learners' affective, cognitive and psychomotor abilities.

- a) What characteristics does science "possess" that enables its teaching to develop learners' affective, cognitive and psychomotor abilities? [3]
- b) Describe, with the aid of examples from the school chemistry curriculum, how the characteristics of science named in (a) can facilitate development of affective, cognitive and psychomotor abilities. [22]

[25]

QUESTION 3

- a) The use of practical work in teaching chemistry serves several aims.

Two of the aims of practical work are:

- To teach learners scientific (chemistry) knowledge
- To help learners develop laboratory skills

Give **TWO** justifications for **each aim** that show how practical work can achieve the stated aims. Use illustrative examples to support your answer. [8]

- b) Study the syllabus content for Topic C6.0 Stoichiometry (see Physical Science (syllabus section attached as Appendix 1).
- i) State **TWO** teaching methods you might consider suitable for maximizing the learning of the content dealt with in the topic “Stoichiometry”. [2]
- ii) Discuss the strengths of **each of the identified methods** regarding teaching the content in stoichiometry, as reflected in the syllabus section provided. [8]
- c) Describe four factors that influence the choice of teaching methods for a lesson. [7]
- [25]

QUESTION 4

- a) State **four** functions of resources in chemistry learning and teaching. [8]
- b) Suppose you wished to use Moly-mod models (also known as atomic/molecular or ball and stick models) to teach concepts from the Chemistry syllabus sub-topic given below, taken from the Topic **C14.0 Organic chemistry**:

C14.4 Homologous series

All learners should be able to:

1. Describe the homologous series as a family of similar compounds with similar properties due to the presence of the same functional group
2. Describe the general characteristics of a homologous series

- i) What might be the strengths of Moly-mod models for learning and teaching the content given in sub-topic C14.4 Homologous series? [9]
- ii) What precautions might you take when using atomic/molecular models when teaching? [8]

QUESTION 5

- a) Assessment of learning is an important step in the education of learners in Chemistry.
What functions might assessment play in learning and teaching of Chemistry? [10]
- b) “Construct related validity” is an important concept in assessment.
How does the Examinations Council of Eswatini maximise the attainment of construct related validity in the EGCSE Physical Science examinations? [7]
- c) EGCSE Physical Science examination assesses practical skills through a practical test or an alternative test.
Describe how each of the approaches assesses practical skills. [8]

End of examination questions

Appendix 1

EGCSE Physical Science syllabus section (for use with Question 3)

C8.0 Stoichiometry

All learners should be able to:

1. use the symbols of the elements and write the formulae of simple compounds found in the syllabus
2. deduce formulae of simple compounds from relative numbers of atoms present
3. determine the formula of an ionic compound from the charges of the ions present
4. construct word equations and simple balanced chemical equations
- 5 deduce the balanced equation of a chemical reaction given relevant information
6. define relative atomic mass (A_r), relative molecular mass (M_r) and relative formula mass (RFM)
7. calculate M_r and RFM as the sum of the relative atomic masses
8. calculate the percentage of mass of components of a compound
9. use the mole and the Avogadro's Constant
10. use molar gas volume taken as 24 dm^3 at room temperature and pressure
11. calculate stoichiometric reacting masses and volumes of gases and solutions, solution concentrations expressed in mol/dm^3 or g/dm^3
(Calculations based on limiting reactants may be examined. Questions on the gas laws and the conversions of gaseous volumes to different temperatures and pressures will not be examined.)
12. calculate the empirical formulae of a compound
13. deduce the molecular formulae from the empirical formulae given the molar mass
14. determine limiting reactants in a chemical reaction