

UNIVERSITY OF SWAZILAND

FACULTY OF EDUCATION

MAIN EXAMINATION PAPER DECEMBER 2012

B. Ed. 11 AND PGCE F/T

TITLE OF PAPER: Curriculum studies in Physics 1

COURSE NUMBER: EDC 282

TIME ALLOWED: Three (3) hours

INSTRUCTIONS:

1. This paper contains five questions.
2. Question 1 is **COMPULSORY**. You may then choose **ANY THREE** questions from questions 2, 3, 4, 5.
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**

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

QUESTION 1**COMPULSORY**

- a. The correct use of units is a necessary skill in physics for investigating relationships between variables and making correct references to quantities.
- A pupil realizes that 1 Joule can be expressed as 1 Nm and hence gives the unit of a moment of force in Joules. Identify the pupil's problem and show how you could help him/her formulate the correct concept. (4)
 - SGCSE uses the SI system of units. Why is it necessary for the scientific community to have SI system? (4)
 - Measurement is one of the first skills that a learner of physics must be able to do. Briefly analyze the fundamental role of measurement skills for all physics learning. (6)
- b. Suppose you are asked to persuade parents to talk to their children about the importance of Physics as a school subject. Outline what you would say under the following headings:
- What physics is about; (3)
 - The relevance in our day to day lives. (8)

(25 marks)

Question 2

- With the help of a simple illustration, explain what you understand by the term analogy. (6)
- What two concepts are being taught by the analogy "soldier?" (4)
- If a student understands clearly how soldiers operate, list two concepts which are likely to confuse the student from the analogy of the 'soldier' if not properly explained.(4)
- Explain five tests an analogy should fulfill /pass to be a useful analogy. (10)

(25 marks)

QUESTION 3

Form 5 students have been working on experiments in their Physics lessons. Design an experiment to find the acceleration due to gravity using a simple pendulum. In your design the following should be included:

- Aim of the experiment;
- Apparatus including the drawing;
- The method;

- d. Table of results;
- e. Theory and calculation;
- f. Precaution(s) students must take care of.

(25 marks)

QUESTION 4

Below you are given two instructional objectives:

4.1 Identifies the parts on a diagram for an electric circuit.

4.2 Labels the parts on a diagram for an electric circuit.

a. Which of the two objectives above most clearly conveys instructional intent? Suggest reasons for your answer. (8)

b. Describe clearly how instructional objectives can be used in marking and reporting on pupils' performance. (10)

c. The importance of instructional objectives in teaching is undisputable.

i. Explain why instructional objectives are important. (3)

ii. Discuss briefly FOUR criticisms against instructional objectives. (4)

(25 marks)

Question 5

Shulman viewed the structure of the subject matter knowledge as characterized by the substantive and syntactic knowledge.

a. What do you understand by the substantive structure of a discipline (5)

b. How does the knowledge of substantive structure of physics help the designers, researchers and implementers of science education curriculum? (10)

c. How does the knowledge of the subject matter of teaching physics help one to be an effective teacher of physics? (10)

(25 marks)