UNIVERSITY OF SWAZILAND

FACULTY OF EDUCATION

EXAMINATION PAPER 2009

B. Ed. III AND PGCE F/T

TITLE OF PAPER : Curriculum Studies in Physics

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

SPECIAL REQUIREMENTS

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

Question 1. Compulsory

In a Form One activity to learn 'What is science?' students are required to investigate the quickest way to empty a bottle of water. They are provided with an empty 2litre coke plastic bottle, a drinking straw, water and a stop watch. Through the activity, they are expected to make hypotheses, design and test their hypotheses, taking and recording appropriate measurements until they can make a conclusion.

a. Design a flowchart of the chain of reasoning that could be used by the class to reach a conclusion. [5]
b. Outline **four** processes which the students experience in this activity in order to answer the question 'what is science'. [5]
c. Design an experimental procedure which the students could use to deduce the fastest way to empty a bottle of water. [5]
d. In what ways can this activity show two limitations that exist in the methods of science?
e. In the study of scientific revolutions, what is a paradigm shift? [5]
f. Select one example from the history of science to demonstrate the idea of a paradigm shift. [5]

Question 2

Contemporary science and society are in a state of constant debate about who determines the direction of scientific research. Discuss. [25]

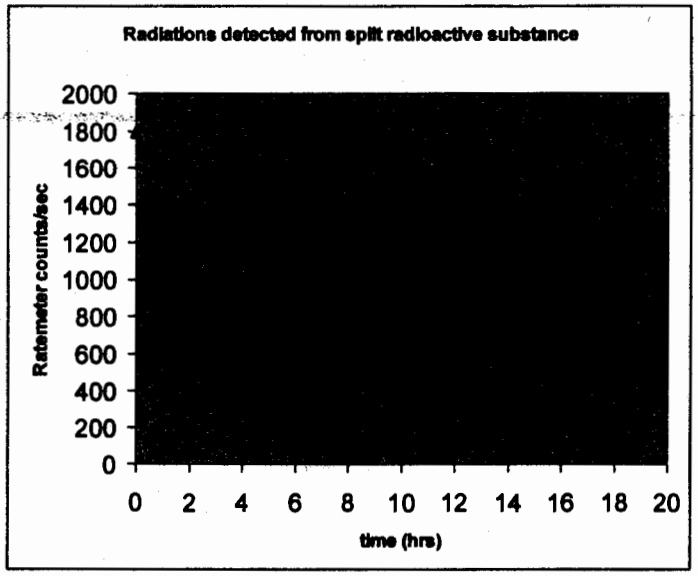
Question 3

a. What is scientific literacy? [10]
b. Critically analyze the importance of public literacy in science in Swaziland.[15]

Question 4

Assessment of practical work is critical for measurement of the achievement of learning outcomes. Outline a detailed framework for teaching and assessing the development of practical physics skills in one term. [25]

Question 5



The graph shows data from measurements of the activity of a radioactive source. Your Physics class will use this graph to investigate information about radioactivity and general exponential behavior.

a. Outline the precautions you will take in conducting the experiments. [5]

b. Show how you will lead the class to deduce the following:

i. Half life
ii. Radioactive Decay constant
iii. Background radiation count
iv. Time constant

[20]