

**UNIVERSITY OF SWAZILAND**

**FACULTY OF EDUCATION**

**MAIN EXAMINATION PAPER**

**MAY/JUNE 2012**

**B.Ed. III and PGCE F/T**

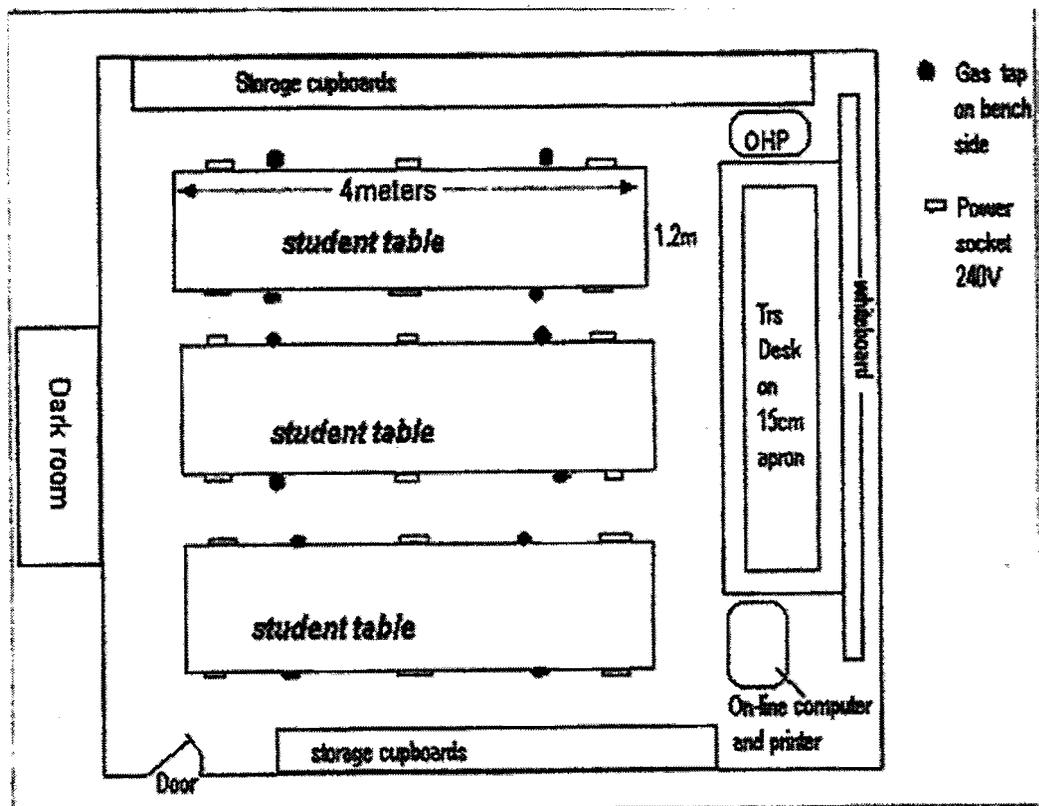
- TITLE OF PAPER** : Curriculum Studies in Physics.
- COURSE NUMBER** : EDC 382
- TIME ALLOWED** : Three (3) hours
- INSTRUCTIONS** :
1. This paper contains FIVE questions.
  2. Question 1 is COMPULSORY. You may then choose ANY THREE questions from questions 2, 3, 4, and 5.
  3. Each question is worth 25 marks
  4. Any piece of material or work which is not intended for marking should be clearly **CROSSED OUT**
  5. Ensure that responses to questions are **NUMBERED CORRECTLY**
- SPECIAL REQUIREMENTS** : **NONE**

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

**Section A. Compulsory.**

**Question 1**

Your Physics class has 24 students and the laboratory has a structural layout as indicated in the diagram below. Electricity sockets and gas taps are fitted to the dropping sides of the wooden tables such that the top surface is bare. You have four periods per week for practical physics. Carefully study the plan of the physics lab and answer the following questions.



- a. What are the advantages of having wooden tables in a laboratory? [2]
- b. Why is a white board preferred to a green board? [2]
- c. What four features do you recommend for the laboratory? [4]
- d. Why are the following necessary in the laboratory design:
  - i. Dark room
  - ii. Raised apron
  - iii. Bare table tops [6]
- e. To what extent does the design of the laboratory facilitate learner-centered teaching methods? [5]
- f. Outline how you would use the following teaching aids:
  - i. OHP to physically demonstrate Faradays laws of electromagnetic induction
  - ii. Computer to analyze current-voltage variation across a circuit component. [2x3]

**SECTION B. Answer any three (3) questions**

**Question 2**

Frequent class and out of class exercises are essential for continuous assessment of students.

- a. Outline the nature of continuous assessment? [4]
- b. How is continuous assessment used to support learning? [10]
- c. Some institutions believe in using continuous assessment instead of terminal examinations. Discuss the pros and cons of this arrangement. [10]

**Question 3**

Discuss the following issues related to the nature of science that seem to be most problematic for many science teachers:

- a. Hypotheses become theories that in turn become laws. [5]
- b. Evidence accumulated carefully will result in sure knowledge. [5]
- c. Science and technology are identical. [5]
- d. Experiments are the principal route to scientific knowledge. [5]
- e. A general and universal scientific method exists. [5]

**Question 4**

- a. Briefly outline any five approaches to teaching science that promote scientific literacy in Swaziland. [10]
- b. How could a teacher check that the children are achieving scientific literacy as a result of the learning experiences in school? [5]
- c. Select and discuss one social issue in which the knowledge of science is necessary for decision-making. [10]

### Question 5

a. Explain what you understand by the term context- based lesson by describing factors that characterize such a lesson [5]

b. How do such lessons (context-based) support students' learning? [5]

c. Two students are having a discussion about an experiment in which the air inside a bell jar is gradually removed. The sound of a ringing bell inside the jar is heard to diminish in intensity during this process.

One student suggests that the frequency  $f$  of a sound wave and the pressure  $p$  are related by the equation:

$$f = kp^2$$

where  $k$  is a constant.

The students designed a laboratory experiment to find out whether the other student was correct. They drew the diagram showing the arrangement of the equipment and wrote an account of how they carried out the experiment. They paid particular attention to the following:

i) the procedure to be followed.

ii) the measurements that would be taken,

iii) how the frequency of the sound would be measured using a cathode –ray oscilloscope,

iv) the control of variables,

v) how the data would be analyzed,

vi) any safety precautions that they took.

As a physics teacher, prepare a marking scheme for the experiment [15]