

UNIVERSITY OF SWAZILAND
FACULTY OF EDUCATION
DEPARTMENT OF CURRICULUM AND TEACHING

FINAL EXAMINATION PAPER 2006

B. Ed. III AND PGCE

TITLE OF PAPER : Curriculum studies in Physics II
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, 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

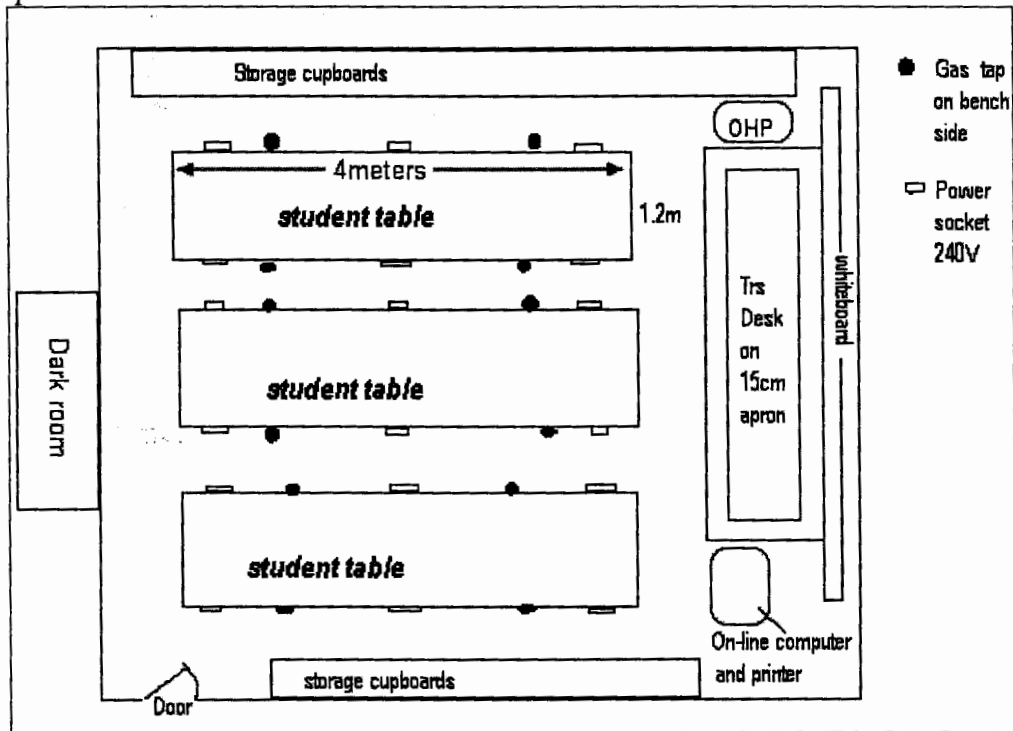
SPECIAL REQUIREMENTS: NONE

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 the laboratory? [2]
- b. Why is a whiteboard preferred instead of the traditional green board? [2]
- c. What four safety 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 this laboratory facilitate learner-centered teaching methods? [5]
- f. Outline how you could use the following teaching aids
 - i. OHP to physically demonstrate Faradays laws of electromagnetic induction
 - ii. Computer to analyse current –voltage variation across a circuit component. [2x3]

SECTION B. Answer any three (3) questions.

Question 2

- a. What are the purposes of practical work in school physics? [10]
- b. The alternative-to-practical examination is regarded as one way of assessing practical skills:
 - i. What advantages are served by the alternative-to-practical examination? [5]
 - ii. Outline two pedagogical approaches you could use to prepare students for an alternative to practical examination. [5]
 - iii. How do public examinations guarantee validity and reliability of assessment in practical skills? [5]

Question 3

The environment is a good context for learning physics. Using appropriate sketches analyse **each** of the following situations and outline in detail, a relevant physics concept that can be learnt by a Form 5 physics pupil.

- a. A javelin thrower first runs and throws it at an angle into the air. Javelin lands pointed into the ground some distance away [5]
- b. Playground swings (*umjiken*) always come to rest at the same position [5]
- c. During a light drizzle on a sunny afternoon, a rainbow is seen in the sky. [5]
- d. Wireless transfer of pictures from cell phone to a computer [5]
- e. One can estimate the position of a lightning strike by the time lapse between the flash and the sound of thunder. [5]

Question 4

- a. Discuss the meaning of relevant physics education for a developing country. [15]

Question 5

Explain the following aspects of the nature of science and the scientific worldview.

- a. The universe is understandable [5]
- b. Science demands evidence [5]
- c. Science explains and predicts [5]
- d. Science is a complex social activity. [5]
- e. There are generally accepted ethical principles in the conduct of science [5]

Question 6

The following is an **excerpt** from an IGCSE physics specimen paper. (May/June 2000)

- a. Outline five (5) scientific skills that are tested by the examination question? [10]
- b. Draw up a detailed marking scheme that could be used to mark the question. [15]

4 The apparatus shown in Fig. 4.1 is used in a heat experiment.

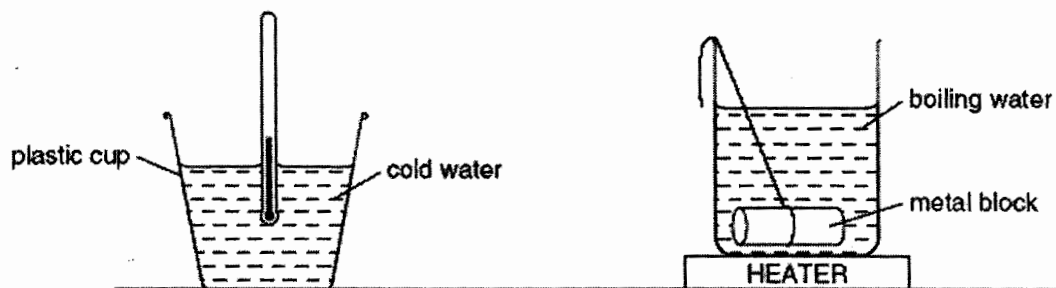


Fig. 4.1

A piece of metal at the boiling temperature of water is transferred to a mass of cold water. Initially, the cold water is at a temperature of T_C . The hot metal raises the temperature of this water to T_H . The rise in temperature, θ , is determined from the relation $\theta = T_H - T_C$. The experiment is repeated so as to obtain five sets of readings for different masses of cold water.

(a) Draw up a table, for use in your laboratory notebook, in which you can record

m , the mass of cold water used,

T_C , the temperature of the cold water,

T_H , the maximum temperature reached by the cold water,

θ , the rise in temperature of the cold water.

[3]

(b) Fig. 4.2 on page 9 is a graph showing how θ varies with m , the mass of cold water used.

(i) Why has a smooth line been drawn through the points?

.....
.....
.....

[2]

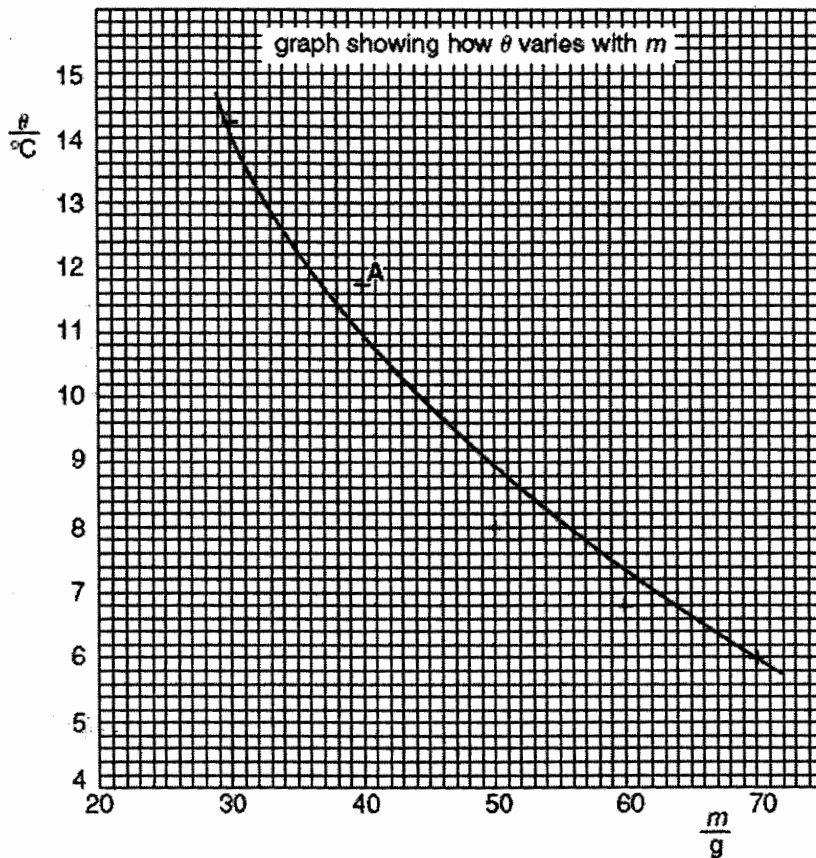


Fig. 4.2

(ii) The graph point that is labelled A does not lie on the graph line. (You can assume that the graph line is correctly drawn.) Complete the following statements about the value of θ and of m at the point A.

1. If the value of θ were °C smaller, the point A would lie on the line.

2. If the value of m were g smaller, the point A would lie on the line.

[2]

(iii) In (ii) above which is the most likely reason, 1 or 2, for the point A not being on the line? Give a reason for your choice.

choice: Tick **one** box.

1.

2.

reason:

.....

..... [4]

"Reproduced by permission of the University of Cambridge Local Examinations Syndicate."