

**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 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** IGCSE Physical Science Syllabus (0652)

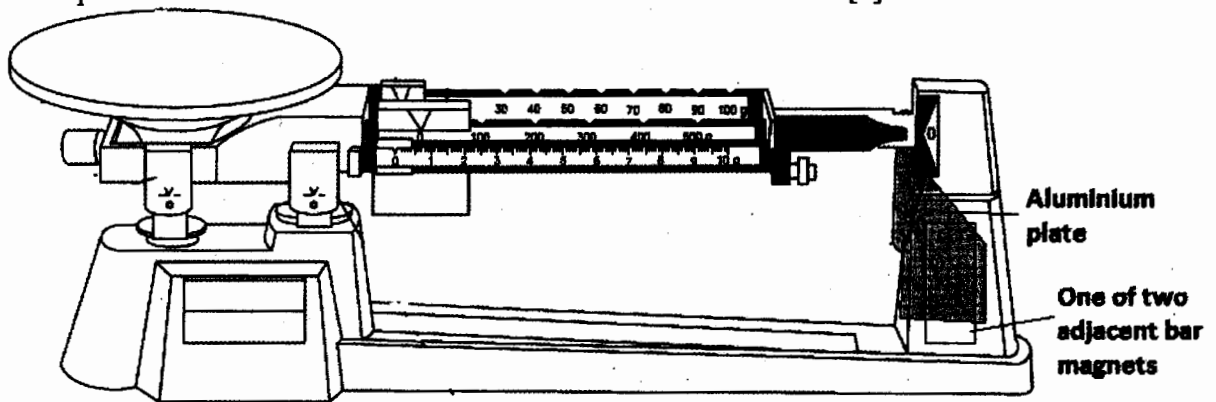
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**Question 1 This question is compulsory and carries 40 marks.**

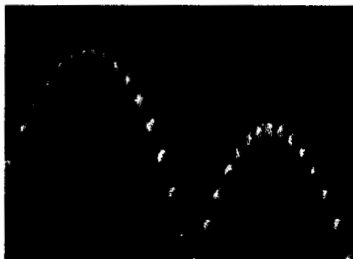
A textbook explains electromagnetic induction using the equation

$\varepsilon = -N \frac{d\phi}{dt}$ . Your non-math student fails to understand the meaning of this equation and asks that you practically demonstrate the meaning of this equation.

- a. Given a galvanometer, enameled copper wire and a bar magnet, draw annotated diagrams to show how you would practically demonstrate that:
- i. induced emf is in a particular direction [4]
  - ii. magnitude of induced emf depends on the rate of flux linkage [4]
  - iii. energy is conserved in electromagnetic induction [4]
  - iv. the number of turns influences emf [4]
- b. Explain to a Form 4 class how the following principles are applied in the triple beam balance:
- i. electromagnetic induction in the frictionless damping system [4]
  - ii. Principle of moments [4]



- c. Give a correct analysis and correction of the common textbook misconception that *'electricity flows like water in a hose pipe, from high to a low pressure point.'* [6]
- d. Draw velocity-time graphs to summarise the vertical motion in the following kinematic situations:
- i. Golf ball bounces three times on a hard surface with less height at each rebound



- ii. A paratrooper jumps from a plane at 3000m above the ground and deploys his parachute after freely falling for 20 seconds. [5]

**Question 2.**

You students are confused about the meaning of certain paired concepts:

**Pair 1:**        *heat and temperature*

**Pair 2:**        *thermal gradient and potential difference*

Through discussions, you suspect that the source of the confusion is from notes given by their former teacher. Design a method you could use to help your students confront this misconception. [20]

**Question 3.**

You are made in charge of a physics club at your school. Your club receives a donation of old non-functional radios and televisions from a local electronics company. Design a program of activities for the physics club where they can use the 'electronics junk' to learn physics beyond the syllabus. [20]

**Question 4**

Your rural school student says in class, 'Sir, physics is only possible in town schools where they have more gadgets. Here in the rural areas; we don't even have electricity, how can physics be useful to us?' Plan a program of activities to make Physics relevant for rural contexts. [20]

**Question 5**

You are teaching the topic 'What is Science' to a Form One class. Design four simple activities which the class can do in rotating groups such that at the end of a double period, they would be able to outline the characteristics and limitations of science as a human endeavour. [20]