

NATIONAL UNIVERSITY OF LESOTHO

DEPARTMENT OF SCIENCE EDUCATION

B. SC. ED. SUPPLEMENTARY EXAMINATIONS

SCE 3251 – 08 SECONDARY LABORATORY WORK IN PHYSICS

AUGUST 2023

MARKS: 100

TIME: 3 HRS

Instructions: - There are Five Questions in this Paper

Answer **Any FOUR** Questions

Each question carries 25 marks

Question 1

(a) Design a practical work to determine the density of an irregularly shaped solid. The following points are the guidelines.

- Aim(s)/objective(s)
- Materials
- Procedure
- Expected results
- Conclusion

[15]

(b) State and describe three skills you would want your students to develop through engaging in the practical work in (a) above.

[6]

(c) Describe your role as a teacher during the practical work in (a) above.

[4]

Question 2

(a) Mention two factors a teacher must consider when administering a Physics practical test.

[2]

(b) List three skills a Physics practical test assesses.

[3]

(c) A Physics teacher set a practical test on Hooke's law.

(i) List all the apparatuses needed to perform the experiment on Hooke's law.

[4]

(ii) Candidates are to fill out a table of load and extension. Describe how each is to be determined.

[4]

(iii) Set five marks cognitive question(s) that could be asked in this experiment.

[3]

(iv) Draw a marking scheme for the question(s) in (iii) above.

[3]

(d) In a Physics practical test on a period of a pendulum, candidates are ordered to measure time for twenty swings.

(i) Explain why they use more than one swing.

[2]

(ii) Describe how the number of swings and time taken should be used to determine the period of a pendulum.

[2]

- (iii) State and explain one issue that could indicate malpractice in this practical test. [2]

Question 3

A teacher claims that he is forced to do a demonstration in teaching a particular Physics concept.

- (a) Explain what demonstration is in science teaching. [1]
- (b) Outline two disadvantages of demonstrations. [2]
- (c) Describe why a teacher may be forced to demonstrate in teaching LGCSE Physics. Provide two examples. [6]
- (d) Referring to a topic (or concept) in LGCSE Physics, discuss how the Predict-Observe-Explain-Explore strategy may be used to engage students in a case where demonstrations are used. [16]

Question 4

Part of the LGCSE Physical Science 0181 syllabus is shown.

P2.1 (b): Thermal expansion of solids, liquids and gases		
1. perform experiments to illustrate the thermal expansion of solids, liquids and gases		
2. explain expansion in terms of particle motion	3. describe the relative order of magnitude of the expansion of solids, liquids and gases in terms of motion and arrangement of molecules	
4. identify and explain some of the everyday applications and consequences of thermal expansion		

- (a) Draw a lesson plan for an eighty minutes lesson involving practical work addressing the P2.1(b):1. [20]
- (b) Describe the importance of planning a lesson, particularly one involving practical work. [5]

Question 5

- (a) A Physics teacher claims that students should not be allowed to perform experiments on current electricity for their safety.
- (i) State one health hazard in performing practical work on the current electricity. [1]

- (ii) Suggest how the teacher could let students perform the practical work safely. [6]
- (b) With the help of elaborate examples, describe three other topics (or concepts) in LGCSE Physics that could pose health hazards to students when performing practical work. [9]
- (c) State two Physics laboratory materials and how they should be stored so that they do not get destroyed. [4]
- (d) Suggest how grouping students could minimise health risks associated with laboratory work in Physics. Support your answer with example(s) of laboratory work. [5]