



**MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY
(MMUST)**

UNIVERSITY EXAMINATIONS

2023/2024 ACADEMIC YEAR

THIRD YEAR FIRST SEMESTER EXAMINATIONS

**FOR THE DEGREE OF
BACHELOR OF EDUCATION (SCIENCE)**

MAIN EXAM

COURSE CODE: ESM 323

TIME: 2 HOURS

COURSE TITLE: PHYSICS EDUCATION

DATE: 7/12/2023

TIME: 3:00-5:00PM

INSTRUCTIONS TO CANDIDATES

Question 1 is Compulsory and carries 25 marks. Answer ANY OTHER three Questions each carrying 15 marks

MMUST observes ZERO tolerance to examination cheating

This Paper Consists of 2 Printed Pages. Please Turn Over.

QUESTION ONE

(25Marks)

- a) Define the following terms as used in physics education (5 Marks)
- i) Science
 - ii) Teaching Strategy
 - iii) Science Laboratory
 - iv) Objective Test
 - v) Metacognitive Knowledge
- b) The first step in scientific method is to make observation on something that you would like to learn about. State any **two** ways of making good observation in physics practical work. (2 Marks)
- c) What is the difference between dynamic and static views of science? (2 Marks)
- d) With reference to ongoing curriculum reforms in Kenya, state **two** physics related learning areas/subjects which learners should take before joining senior school Physics. (2 Marks)
- e) Due to gravitational force, matter in space at a certain height is attracted downwards towards the center of the earth. A student noticed that smoke which is matter goes up. Briefly explain why smoke was seen going against the law of gravitation. (2 Marks)
- f) Relate the first **four** general physics learning objectives to national goals of education. (8 Marks)
- g) Explain how reusing of physics learning resources is an environmental conservation strategy. (4 Marks)

QUESTION TWO

(15 Marks)

- a) Given the Eureka can, beaker, beam balance, spring balance, measuring cylinder, retort stand, stone, thread and water to confirm Archimedes principle,
- i. Describe how the learner will set up the experiment. (3 marks)
 - ii. Explain how the learner can acquire any **three** basic science skills in this practical work. (6 Marks)
- b) Describe any **three** factors to consider when preparing to teach introduction to physics in form one. (6 Marks)

QUESTION THREE

(15Marks)

- a) Use the following information to develop a single competency-based physics lesson plan.
Use administrative details of your choice. (11Marks)

Given **Strand:** Force and Energy

Sub Strand: Static Electricity

Specific Learning outcome: By the end of the lesson, the learner should be able to charge objects using rubbing method

Suggested Learning Experiences: The learner is guided to:

- Charge plastic, wooden and metallic objects by rubbing.
- Discuss with peers in a group the applications of rubbing as a method of charging objects.

Learning Resources: Plastic and metallic rods, pieces of paper, woolen clothe/material, gold leaf electroscope and any other relevant materials.

Assessment Methods: Observation, Oral questions and Performance assessment

Core Competencies:

- Communication and Collaboration as they work in groups
- Learning to learn: As they charge different materials through rubbing.

Values:

- Respects: As they respect each other's opinion when discussing
- Responsibility: As they handle different apparatus carefully

- b) What is the difference between inductive and deductive approaches in teaching physics?

(4 Marks)

QUESTION FOUR

(15 MARKS)

- a) Explain any **four** ways of using demonstration effectively in a physics lesson.(8 Marks)
- b) State any **four** digital hardware devices which you can use in physics fieldwork lesson.
(4 Marks)
- c) Give any **three** factors that a teacher should consider when planning a standardized physics test.
(3 Marks)

QUESTION FIVE

(15Marks)

- a) State any **four** of the physics skills that the learner can develop from using the internet.
(4 Marks)
- b) Highlight any **five** physics laboratory laser safety rules.
(5 marks)
- c) Explain **three** reasons why context should be considered when preparing to teach a physics lesson.
(6 Marks)