



UNIVERSITY EXAMINATIONS

2ND SEMESTER 2023/2024 ACADEMIC YEAR
THIRD YEAR EXAMINATION FOR THE DEGREE
OF BACHELOR OF EDUCATION (ARTS)

EDCI 333: METHODS OF TEACHING PHYSICS

STREAM: R

TIME: 2 HRS

DAY: FRIDAY (2.30-4.30PM)

DATE: 12/4/24

THIS QUESTION PAPER CONSISTS OF FIVE (5) PAGES

**PLEASE DO NOT OPEN UNTIL THE INVIGILATOR SAYS
SO.**



INSTRUCTIONS: Answer question **ONE** and any other **TWO** questions

QUESTION ONE (30 MARKS)

(a) You intend to teach your Form II Physics students the concept of ‘Electrical Conductivity’ on the topic of ‘Current Electricity’ in which you design the scientific method to classify materials as good conductors, poor conductors and insulators.

- i. Write a suitable statement of the problem (1mk)
- ii. Formulate a suitable working hypothesis for the investigation (1mk)
- iii. Identify the independent variable, the dependent variable and at least two control variables (4mks)
- iv. Outline the three key steps in the procedure (3mks)
- v. Illustrate how you would record the results by citing two materials for each category (2mks)
- vi. From the findings in (v) above write a suitable conclusion for the investigation (1mk)

(b) By citing four reasons, critique four role of Physics in the contemporary society (8mks)

(c) For each of the following test items indicate the level of assessment in the cognitive domain as categorized by Bloom and Krathwohl (1964):

- i. Explain why some materials will float while others sink when roughly placed on the surface of water in a container
- ii. You are provided with several materials. Describe how you would classify the material as magnetic or non-magnetic
- iii. Write a report on ‘The role of Physics in mitigating effects of climate change’
- iv. State Archimedes Principle (4mks)

(d) As a Form I Physics teacher you are teaching the concept ‘Physical quantities, measuring instruments and the SI unit of measure’. By analyzing the statements of intent as outlined in the syllabus, discuss how the student will have achieved one aim of teaching science in

secondary schools and one goal of education in Kenya by the end of the lesson (4mks)

(e) For effective use of the Physics laboratory as a resource for teaching and learning, outline four considerations you would make in designing the gas supply in the laboratory (4mks)

QUESTION TWO (20 MARKS)

(a) You intend to teach the concept 'Ohm's Law' on the topic of 'Current Electricity'. Distinguish how you would plan the key steps in order to develop the lesson using:

- i. Deductive reasoning
- ii. Inductive reasoning (8mks)

(b) Highlight two aspects that characterize the following components of meaningful learning and the implication of each in teaching and learning of Physics

- i. Cognitive - structural view of learning (3mks)
- ii. Associationist view of learning (3mks)
- iii. Discovery learning (3mks)
- iv. Constructivism (3mks)

QUESTION THREE (20 MARKS)

(a) Contrast teacher-centered (expository) and learner-centered (heuristic) approaches to teaching and learning Physics on the following aspects:

- i. Learner involvement
- ii. Knowledge learnt
- iii. Teaching process
- iv. Learning process (4mks)

(b) Examine how each of the following factors are likely to influence the intended educational reforms from the current objective-based to the competency-based curriculum:

- i. Approaches to teaching and assessment (4mks)
- ii. Misconceptions in science (4mks)



- iii. Developments in technology (4mks)
- iv. Learners’ attitude towards science (4mks)

QUESTION FOUR (20 MARKS)

(a) You plan to teach your Form II students a lesson on ‘Effects of a force’ within the topic ‘Forces’.

- i. State two expected learning outcomes appropriate for the lesson (4mks)
- ii. Complete the following sections of an 40-minutes lesson plan (10mks)

Step &Time	Content (Concept/Skill)	Method (Teacher and Learner Activities)	Teaching & Learning Resources

(b) Examine how teaching and learning of Physics develops the following learner abilities:

- i. Verbal knowledge
- ii. Psychomotor skills
- iii. Attitude characteristics (6mks)



QUESTION FIVE (20 MARKS)

(a) As a Form II Physics teacher you plan to teach ‘Types of material in relation to transmission of light – opaque, translucent and transparent’. Identify any three science process-skills and describe how they can be achieved by the end of the lesson (6mks)

(b) Examine ‘Experiment’ as a method of teaching and learning of Physics under the following aspects:

- i. When suitable to use (2mks)
- ii. Key teacher roles before, during and after the experiment (4mks)
- iii. Two strengths (2mks)
- iv. Two limitations (2mks)
- v. Improvement for each of the limitations in iv above (2mks)

