



MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY

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UNIVERSITY EXAMINATIONS 2023/2024

THIRD YEAR SECOND SEMESTER EXAMINATION FOR DEGREE OF BACHELOR OF SCIENCE
IN EDUCATION SCIENCE

ECT 3353: PHYSICS SUBJECT METHODS

DATE: APRIL 2024

TIME: 2 HOURS

INSTRUCTIONS: Answer Question ONE and any other TWO questions.

QUESTION ONE (30 MARKS)

a) You've been assigned to teach physics to form 1 K at Meru School. Prepare an eighty minutes' practical lesson on **measurement** to be taught on Monday starting at 8.20 am

(8 marks)

b) Match each of the following 21st century skills against the key physics concepts and the delivery methodology to be used by the teacher to teach the concepts to the learners.

(7 marks)

21 st century skill	Physics concept	Teaching methodology
Critical thinking.	charges	Learner centred
Creativity	Linear motion	Flipped
Problem solving	Waves	Cooperative learning
Perseverance	density	Inquiry base learning
Communication and Collaboration skills	heat	Problem based learning
Information literacy	Matter	Teacher centred
Technology skills and digital literacy	Refraction	Small group instruction



- c) Explain a thought of criteria a physics teacher could use to appraise whether a teaching method is good and effective. (4 marks)
- d) After conducting an experiment on determining the relationship between mass and weight a learner plotted the results that generated a curve. Guide the learner how to use the same results to generate a straight line graph. (4 marks)
- e) What are the four merits a physics teacher must consider when constructing a test? (4 marks)
- f) Differentiate between the concept of *catering for individual differences* and *guided learning*. (3 marks)

QUESTION TWO (20 MARKS)

- a) State and explain three specific physics subject learning areas you would teach the learners from outside the classroom. (8 marks)
- b) By giving relevant examples explain five strategies a physics teacher would use to enhance inquiry based teaching and learning in physics learning areas (12 marks)

QUESTION THREE (20 MARKS)

- a) Why do you think the learners should be taught the national goals of education guiding the teaching and learning of physics? (6marks)
- b) Explain what a competency based qualified professional teacher should do to generate a comprehensive physics marking scheme in response to any test to be undertaken by learners. (14 marks)

QUESTION FOUR (20 MARKS)

- a) Discuss ways in which a physics teacher would use the project based teaching and learning methodology to boost learners' views of their inner potential and that of the community in utilizing physics for development (12 marks)
- b) Justify the need for a physics teacher trainee to undertake:
 - i. Job shadowing (4 marks)
 - ii. Community service as part of their competency based training. (4 marks)



QUESTION FIVE (20 MARKS)

- a) Why do you think demonstration technique of teaching and learning is critical in generating relevant knowledge, skills, and attitudes in learners? (6 marks)
- b) Discuss various techniques a physics teacher would use to design a lesson to maintain interest and promote learner's success (7 marks)
- c) A cylinder of mass 5 kg and a radius of 50 cm is held on a step of 40 cm high. Clearly discuss how you would teach the learners to determine the amount of force required to raise the cylinder over the step. Take $g = 10\text{N/Kg}$. (7 marks)

