



MACHAKOS UNIVERSITY

University Examinations 2019/2020 Academic year

SCHOOL OF EDUCATION

DEPARTMENT OF EDUCATIONAL COMMUNICATION AND TECHNOLOGY

AUGUST SESSION EXAMINATION FOR

**DOCTOR OF PHILOSOPHY IN EDUCATIONAL COMMUNICATION AND
TECHNOLOGY**

ECT 920: ADVANCED INSTRUCTIONAL METHODS IN PHYSICS

DATE: 21/12/2019

TIME: 8.30-11.30 AM

INSTRUCTIONS

ANSWER QUESTION ONE AND ANY TWO OTHERS.

QUESTION ONE (30 MARKS)

- a) Critically explain four strategies of meaningful learner Engagement and how they relate to the theory of multiple intelligence. (12 marks)
- b) Illustrate with concrete steps ways in which the phases of a learning cycle can be applied to a named Practical Activity in Physics. (9 marks)
- c) Demonstrate three ways in which the Experiment method differs from Simulation/ Gaming. (9 marks)

QUESTION TWO (20 MARKS)

Discuss five ways in which the project method differs from field investigation.

QUESTION THREE (20 MARKS)

Some Scientists have proposed that the goal of science is to: generate the most powerful research programme (Iakatosianism); appreciate the historical reality and change our view of nature (Kuhnneanism); generate solutions to human problems. (Pragmatism); contribute to technological development (modernism). Discuss your position on these views for the teaching of Physics.

QUESTION FOUR (20 MARKS)

Evaluate and illustrate three ways in which ICT may enhance the teaching of Physics.

QUESTION FIVE (20 MARKS)

How useful is the Vee-diagram as a tool for planning for a practical assessment? Discuss this with reference to a named topic in Physics?



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ECT 918: ADVANCED INSTRUCTIONAL METHODS IN BIOLOGY.

DATE: 19/12/2019

TIME: 9.00-12.00 PM

INSTRUCTIONS

ANSWER QUESTION ONE AND ANY TWO OTHERS.

QUESTION ONE (30 MARKS)

- a) Critically explain four strategies of meaningful learner Engagement and how they relate to the theory of multiple intelligence. (12 marks)
- b) Justify three ways in which the phases of a learning cycle can be applied to a named Practical Activity in Biology. (9 marks)
- c) Explain three ways in which Experiment method differs from Group discussion. (9 marks)

QUESTION TWO (15 MARKS)

Evaluate five ways in which the project method is advantageous to the field investigation.

QUESTION THREE (15 MARKS)

Some Scientists have proposed that the goal of science is to: generate the most powerful research programme (Iakatosianism); appreciate the historical reality and change our view of nature (Kuhnneanism); generate solutions to human problems. (Pragmatism); contribute to technological development (modernism). Discuss and Illustrate how these views would be integrated into the planning for teaching Biology.

QUESTION FOUR (15 MARKS)

Defend and illustrate three ways in which ICT may enhance the teaching of Biology.

QUESTION FIVE (15 MARKS)

Evaluate the use of the Vee-diagram as a tool to plan for a practical assessment with reference to a named topic in Biology?



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ECT 923: CONTEMPORARY AND EMERGING ISSUES IN PHYSICS.

DATE: 21/12/2019

TIME: 12.00-3.00 PM

INSTRUCTIONS

ANSWER QUESTION ONE AND ANY TWO OTHERS.

QUESTION ONE (20 MARKS)

- a) Critically explain ISSUES emerging from the new Competence-Based Curriculum in the following areas:
- i. The readiness of the Physics Teacher. (3 marks)
 - ii. The competence of the trainers. (3 marks)
 - iii. Transition between levels of Education. (3 marks)
 - iv. Teacher Education pre-service programme. (3 marks)
- b) Assess four ways in which the teaching of Physics can promote Industrial Development. (8 marks)

QUESTION TWO (15 MARKS)

Defend your suggestion for five ways in which the quality of the Physics teacher can be developed.

QUESTION THREE (15 MARKS)

Explain five ways in which research in Physics Education has promoted the growth of Physics.

QUESTION FOUR (15 MARKS)

Some Science Educators advocate for a focus on Problem-Solving and Process-Skills approach to science teaching; while others advocate for innovative speculation. Discuss how these views would be integrated into the planning for teaching Physics.

QUESTION FIVE (15 MARKS)

Discuss and illustrate three ways in which the Government may enhance the teaching of Physics.



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ECT 924: CONTEMPORARY AND EMERGING ISSUES IN BIOLOGY.

DATE: 19/12/2019

TIME: 2.00-5.00 PM

INSTRUCTIONS

ANSWER QUESTION ONE AND ANY TWO OTHERS

QUESTION ONE (25 MARKS)

- a) Critically explain ISSUES emerging from the new Competence-Based Curriculum in the following areas:
- i. The readiness of the Biology Teacher. (3 marks)
 - ii. The competence of the trainers. (3 marks)
 - iii. Transition between levels of Education. (3 marks)
 - iv. Teacher Education pre-service programme. (3 marks)
- b) Discuss four ways in which the teaching of Biology can promote Socio-economic Development. (8 marks)

QUESTION TWO (15 MARKS)

Suggest and defend five ways in which the policy on the development of the Biology teacher can be developed.

QUESTION THREE (15 MARKS)

Illustrate five ways in which research in Biology Education has promoted the growth of the subject.

QUESTION FOUR (15 MARKS)

Some Science Educators advocate for a focus on Problem-Solving and Process-Skills approach to science teaching; while others advocate for innovative speculation.

Evaluate the strength of each view in relation to the teaching of Biology.

QUESTION FIVE (15 MARKS)

Suggest and illustrate three ways in which the Government may enhance the teaching of Biology.