

UNIVERSITY OF ESWATINI

Faculty of Education

Department of Curriculum and Teaching

Main Examination Paper

Semester 2 2021

PGCE

Title of Paper: **Curriculum Studies in Physics II**

Course Number: **CTE 534 / CTE334**

Time allowed: **Three Hours (3hrs)**

Information and INSTRUCTIONS

1. This paper contains TWO Sections
2. Section 1 is **COMPULSORY** and carries 40 marks.
3. Choose any **THREE** questions from Section 2. Each question carries 20 marks.
4. CROSS OUT any written material not intended for marking should be.
5. Ensure that **EACH** page clearly shows the question answered.

Do NOT BE OPEN THIS PAPER UNTIL INSTRUCTED BY THE INVIGILATOR

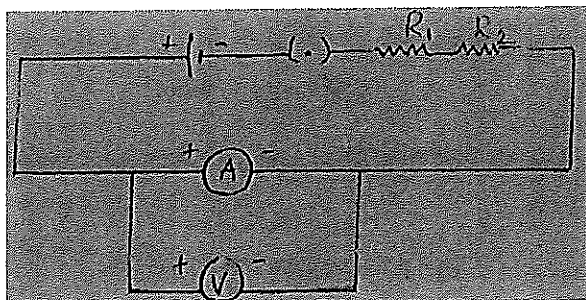
SECTION ONE

Answer all questions in this section.

1. Which of the following is the best definition of a theory?
 - A. An educated guess to explain specific observations or what you think might happen
 - B. A proven fact
 - C. A belief held by many people over a long period that is not supported by evidence.
 - D. An idea that is currently accepted and is supported by a lot of evidence
2. Which of the following does the theory of gravity explain?
 - A. Why living things are adapted to survive in their environments.
 - B. How the Universe started as a small, infinitely dense mass.
 - C. Why Australia is moving north at the rate of a few centimetres per year.
 - D. Why planet Earth orbits the Sun
3. Which one of the following is not a desirable aim of science at high school
 - A. To know the principles and facts of science and their application
 - B. To gain the knowledge available through memorising the content and process of science
 - C. To imbibe the values of honesty, integrity and cooperation
 - D. To nurture natural curiosity, aesthetic sense and creativity in science and technology.
4. What is the primary goal of the mass media in reporting science?
 - A. To inform the public of new scientific discoveries and breakthroughs
 - B. To make money for their shareholders
 - C. None of the other answers is correct
 - D. To get people excited about science
5. The best description of a theory is
 - A. a description of a specific relationship under given conditions
 - B. a statement describing what always happens under certain conditions
 - C. well-supported and widely accepted explanation of nature
 - D. an explanation based on opinion
6. Which of these statements best describes how scientific ideas change?
 - A. New evidence leads to modification of ideas.
 - B. Scientific ideas rarely change because they are based on extensive evidence.
 - C. As a scientific idea changes, it eventually becomes a scientific theory and then a law
 - D. Scientists form opinions based on evidence and decide how the idea should change

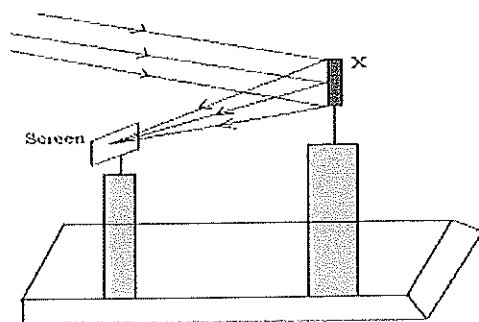
- 7. Which term describes a collection of observations on which a scientific explanation is based**
- A. scientific law
 - B. empirical evidence
 - C. scientific theory
 - D. fieldwork
- 8. During a scientific investigation, which step will a scientist likely perform first?**
- A. Defend conclusions drawn from data
 - B. Collect and organise data.
 - C. Plan the experimental procedure
 - D. Define the problem for investigation
- 9. Which of these answers best describes a scientific law?**
- A. a well-supported and widely accepted explanation of nature
 - B. a statement describing what always happens under certain conditions
 - C. an explanation based on the opinion of a scientist
 - D. a description of a specific relationship under given conditions
- 10. How many independent variables does an experiment have?**
- A. four
 - B. two
 - C. three
 - D. one
- 11. What is a logical conclusion based on observations called?**
- A. data
 - B. observation
 - C. experiment
 - D. inference
- 12. Scientific investigations include many different steps. During a scientific investigation, which step occurs after a scientist collects data?**
- A. plan the experiment
 - B. draw conclusions
 - C. form the hypothesis
 - D. follow the procedure
- 13. Science education is true to life. What does this mean?**
- A. Science should prepare a child for the world of work
 - B. Science should be able to engage the child meaningfully
 - C. Science should engage the child in the processes of science knowledge

- D. Science should help in living an easy life
 - E. The student learns to observe and interpret everyday experiences.
- 14. Which one of the following is not true to the nature of science?**
- A. Science is always tentative
 - B. Science promotes scepticism
 - C. Science is a process of collecting knowledge
 - D. Science is static.
- 15. Why is formative assessment critical in Science education?**
- A. It is easy to conduct
 - B. It helps in developing scientific temper in students.
 - C. It is diagnostic
 - D. It helps in a better understanding of science.
- 16. Multiple-choice tests have the advantage that**
- A. They give options to the student
 - B. There is always a chance that one answer is correct
 - C. It examines a wide range of topics
 - D. Different options can test higher cognitive objectives.
- 17. The first significant shift between traditional ethics and science-based ethics occurred around what event?**
- A. The invention of social media
 - B. Industrialisation
 - C. The first moon landing
 - D. The Cold War
- 18. Which of these is NOT a standard part of industrialisation?**
- A. Urbanisation
 - B. Greater access to education
 - C. A revitalisation of traditional values
 - D. Increased gender equality
- 19. Assessment as learning in science means**
- A. Formative assessment
 - B. Summative assessment
 - C. Self-assessment
 - D. Term assessment
- 20 To determine the equivalent resistance of a series combination of two resistors R1 and R2, a student arranged the following set-up. Which of the following statements will be valid for this circuit? It gives**



- A. An Incorrect reading for current I and potential difference V.
- B. The correct reading for current I, but incorrect reading for potential difference V.
- C. The correct reading for potential difference V but incorrect reading for current I
- D. The correct reading for both V and I

21 A student determines the focal length of X by focusing the image of a distant object on the screen, as shown in the figure below.



The device X is

- Convex lens
- Concave lens
- Convex mirror
- Concave mirror

D.

22. The best way to prepare a class for an Alternative to Practical examination in Physics is

- A. Revise past examination papers from 5 years ago
- B. Let students read in the laboratory
- C. Do practical procedures with the learners
- D. Watch YouTube channels of physics lectures.

23. Analyse the following statement *"Girls are known to be sloppy with circuit connections."*

- A. This is a sexist preconceived idea
- B. This is true of modern urban girls
- C. Girls have no business doing physics practicals anyway.
- D. Boys are naturally gifted with practical things
- E. Practical physics is not a fair assessment of skill

24. Physics education is relevant for democratic citizenship because:

- A. Everything in The world is now technologically driven
- B. Citizenship has got nothing to do with knowledge of science
- C. Technological literacy helps humans make responsible decisions
- D. You can still make a life without physics

25. Empowerment through science education

- a. Is the underlying conviction of many non-governmental organisations
- b. Is why Women seek to get an equal education
- c. Is the target of most governments
- d. Comes through science literacy.

SECTION B. ANSWER ANY THREE QUESTIONS

QUESTION B1

“a utilitarian curriculum spawns real human development” Hansen (1997). This quote remains true today for science education. Show how Swati science education has promoted the following:

- | | |
|---------------------------------------|-----|
| a. Public health | [5] |
| b. Digital communication | [5] |
| c. Quality of life in domestic spaces | [5] |
| d. Entrepreneurship | [5] |

Question B2

The following is a justification of the AS level in Physics. Outline how a teacher can achieve any two aspects of the nature of science through this syllabus. [20]

As a teacher, you will refer to these concepts repeatedly to help unify the subject and make sense of it. If mastered, learners can use the ideas to solve problems or to understand unfamiliar subject-related material.

- **Models of physical systems** *Physics is the science that seeks to understand the behaviour of the Universe. The development of models of physical systems is central to physics. Models simplify, explain and predict how physical systems behave.*

- **Testing predictions against evidence** *prior observations build Physical models, and their predictions are tested to check that they are consistent with the behaviour of the real world. This testing requires evidence, often obtained from experiments.*

- **Mathematics as a language and problem-solving tool** *Mathematics is integral to physics, as it is the language that is used to express physical principles and models. It is also a tool to analyse theoretical models, solve quantitative problems and produce predictions.*

- **Matter, energy and waves** *Everything in the Universe comprises matter and energy. Waves are a key mechanism for the transfer of energy and are essential to many modern applications of physics.*

- **Forces and fields** *The way that matter and energy interact is through forces and fields. The behaviour of the Universe is governed by fundamental forces that act over different length scales and magnitudes. These include the gravitational force and the electromagnetic force.*

Question B3

Outline five innovations that make Science Education relevant to the youth in Eswatini.
[20]

Question B4

Covid 19 has rearranged school systems all over the world. Concerning Eswatini, outline the following

- i. Covid 19 effect on large classes [5]
- ii. The need to adhere to WHO recommendations for social distancing [5]
- iii. Propose solutions to enable learners to do practical Physics during covid [5]
- iv. what positive changes should be maintained in post-Covid science education? [5]