INSTRUCTIONS TO CANDIDATES:

Answer any TWO (2) questions in section A
and any TWO (2) questions in section B.
SECTION A

1. (a) Discuss the meaning of learning as given by Gregory A. Kimble (1917 – 2006) using the following guidelines:
   i. Kimble’s definition of learning [3 marks]
   ii. Implications of Kimble’s definition [6 marks]
   iii. Questions raised by Kimble’s definition [6 marks]

(b) Identify any FIVE (5) characteristics of learning. [5 marks]

(c) Briefly explain the relevance of the concept of ‘Multiple Intelligences’ to the teaching of science and technology in secondary schools. [5 marks]
[Total 25 marks]

2. (a) Discuss the ‘nature of science’ based on any FIVE (5) characteristics of scientific knowledge that derive directly from how knowledge is formed. [10 marks]

(b) Clearly distinguish between the ‘Baconian Method of Scientific Inquiry’ and ‘Rene Descartes’ Methodic Doubt’. [5 marks]

(c) Highlight FIVE (5) essential features of inquiry in a science and technology classroom. [10 marks]
[Total 25 marks]

3. (a) Define and explain any FIVE (5) types of ‘Constructivism’ in science and technology learning. [10 marks]

(b) State any FIVE (5) basic principles of ‘Constructivism’ in science and technology learning. [5 marks]

(c) Describe how you would use the 5E Instructional Model to facilitate learning of a topic of your choice in an identified level of science classroom. [10 marks]
[Total 25 marks]
SECTION B

4. (a) Explain the importance of 'conceptual change learning model' in the learning of science and technology in secondary schools. [5 marks]

(b) Identify and illustrate with examples the stages of facilitating conceptual change in students' misconceptions in a science and technology lesson. [10 marks]

(c) Explain the THREE (3) major themes of Lev Vygotsky's Social Developmental Theory and highlight FIVE (5) general implications of the theory for the learning of science and technology in secondary school classrooms. [10 marks]

[Total 25 marks]

5. (a) i. What is the relationship between the Ausubel's (1968, 2000) Theory of Assimilation and Concept Mapping? [5 marks]

ii. Describe any FIVE (5) characteristics of a concept map. [5 marks]

(b) Explain the steps involved in constructing a concept map. [5 marks]

(c) Using any science topic of your choice, construct a concept map for 12 year olds to illustrate the relationship between and among the concepts of your chosen topic. The relationships must be clearly stated. [10 marks]

[Total 25 marks]

6. (a) Compare and contrast 'Problem-Based Learning' and 'Cooperative Learning'. [10 marks]

(b) Describe the 'allegory of the cave' as illustrated by Plato. [5 marks]

(c) Discuss any FIVE (5) teaching skills in the learning of science and technology in schools. [10 marks]

[Total 25 marks]

END OF EXAMINATION PAPER