UNIVERSITY OF SWAZILAND

FACULTY OF EDUCATION

MAIN EXAMINATION PAPER

DECEMBER 2014

B. Ed. 11 and PGCE F/T

TITLE OF PAPER: Curriculum Studies in Physics

COURSE NUMBER: EDC 282

TIME ALLOWED: **Three (3) hours**

INSTRUCTIONS:

1. This paper contains five (5) questions.
2. Question 1 is COMPULSORY. You may then choose ANY THREE questions from questions 2,3,4 and 5
3. Each question carries 25marks
4. Any piece of material or work which is not intended for marking purposes should be clearly CROSSED OUT.
5. Ensure that responses to questions are NUMBERED CORRECTLY

THIS PAPER SHOULD NOT BE OPENED UNTIL PERMISSION HAS BEEN GRANTED BY THE INVIGILATOR.

This paper consists of 3 printed pages

Question 1

Magnusson et al (1999) suggested five discrete components of pedagogic content knowledge for a teacher of Physics to have.

a. What are the five discrete components of pedagogic content knowledge for the teacher of Physics? **[5]**

b. Describe, in tabular form shown below, the main concepts and the role of the teacher for each of the five components.

Main concepts of component	Role of the teacher

[20]

[25]

Question 2

The theory of structural cognitive modifiability underpins the belief that individuals have a potential to change and is also hinged on three main components.

a. Explain the three main components of the theory of structural cognitive modifiability. **[6]**

b. What makes the approach of this theory different from remedial teaching? **[4]**

c. Feuerstein used different tools based on Mediated Learning Experience theory such as Instrumental Enrichment. Describe five ways to show how the knowledge of Instrumental Enrichment helps a Physics teacher to be an effective teacher? **[10]**

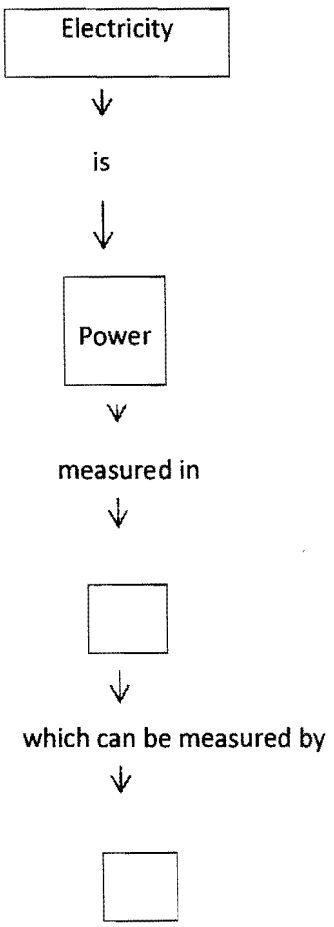
d. Explain why Feuerstein advocated Learning Potential Assessment Devise (LPAD) instead of the Intelligent Quotient (IQ) tests as a method of grouping learners? **[5]**

[25 marks]

Question 3

a. Create a concept map of electricity using the following: mechanical motion, chemical energy and solar energy. Give a suitable heading for the starting point and use correct links. **[10]**

b. Complete the concept map on electricity shown below:



[4]

c. Describe three ways in which the teacher can use the concept map in a physics lesson? **[6]**

d. Write five ways in which students can benefit from the use of concept maps. **[5]**

(25 marks)

Question 4

You are given the following two concepts represented by the formulae:

$$F = \frac{kQ_1Q_2}{r^2} \qquad\qquad F = \frac{Gm_1m_2}{r^2}$$

a. Explain what each of the two formulae stand for? **[2]**

b. Give two statements to explain why the two formulae above are said to be analogous? **[4]**

c. Describe three reasons why analogies are used in teaching Physics? **[6]**

d. What factors do you consider when choosing analogies for teaching physics concepts? **[5]**

e. Discuss the steps you would follow on how to use analogies to correct some misconception in a physics concept of your choice? **[8]**

[25marks]

Question 5

a. What are the purposes of practical work in Science? **[10]**

b. Teachers usually perform some experiments through demonstrations.

i. Give three advantages of using demonstrations. **[6]**

ii. What must a teacher do to make sure the demonstrations are effective? **[4]**

c. What two advantages do class experiments have over demonstrations? **[5]**

[25 marks]