

UNIVERSITY OF SWAZILAND

MAIN EXAMINATION PAPER 2005: BED III PRIMARY

COURSE NUMBER: PEC 376/377

COURSE NAME: CURRICULUM STUDIES IN SCIENCE WITH MATHEMATICS

TIME ALLOWED: 3 HOURS

- INSTRUCTIONS:
1. THIS PAPER IS DIVIDED INTO TWO SECTIONS.
 2. ALL QUESTIONS IN SECTION A ARE COMPULSORY. YOU MAY THEN CHOOSE ANY THREE (3) QUESTIONS FROM SECTION B.
 3. DOCUMENTS REFERRED TO IN SOME OF THE QUESTIONS ARE ATTACHED. IF YOU CAN'T FIND THEM ASK FOR THEM.
 4. ANY PIECE OF MATERIAL WHICH IS NOT FOR MARKING PURPOSES MUST BE CROSSED OUT CLEARLY

SPECIAL REQUIREMENTS: NCC BOOKS: GRADE VII MATHEMATICS
GRADE VII SCIENCE

THIS PAPER MUST NOT BE OPENED UNTIL PERMISSION IS GIVEN BY THE INVIGILATOR

SECTION A -

25 Marks

There is only **one** question in this section. Answer ALL parts of the question using one word, short sentences or letters and number as the case may be. **DO NOT USE LONG SENTENCES FOR YOUR ANSWERS.**

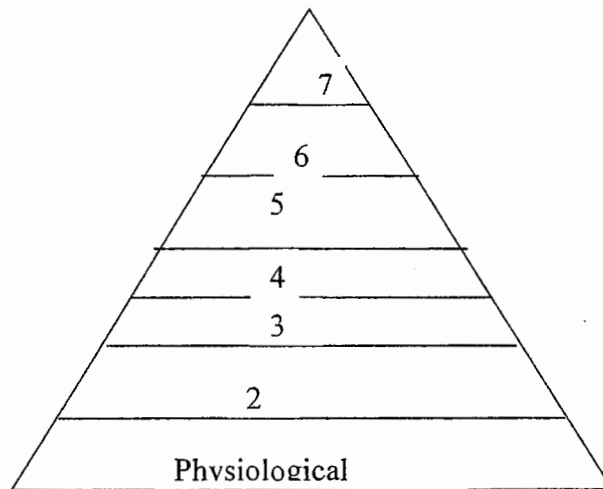
Question 1

a) Which one of the following teaching methods is least suited for teaching problem solving?

- A questioning
- B lecture
- C investigating
- D discussing

(1)

b) (i) Complete Maslow's hierarchy of needs below by writing **three** of the stages represented by numbers 2 through 7. Write only the numbers and your answer.



(3)

(ii) In one sentence, describe what is involved in stage 7.

(2)

c) Study the attainment target below:

Level 1

Pupils describe simple features of object, living things and events. They observe, communicating in simple ways, such as by talking about their work or through drawings or simple charts.

(i) Use this example to show how an objective differs from an attainment target. (2)

(ii) Which phrase(s)/sentence refer to (i) a product and (ii) a process of science? (2)

- d) Look at the selection of teaching resources below and indicate which resources are most suitable for teaching the lessons A, B, C and D below. In your answer, write the letter and the number of your choice.

- 1 the school garden
- 2 science reference books
- 3 a natural pond
- 4 a video
- 5 an expert from outside the school

- A You are teaching about reproduction in flowering plants.
- B The class is doing a lesson on energy flow in an ecosystem.
- C Your class is introduced to industrial processes of making soft drinks.
- D You are reviewing a lesson in astronomy. (4)

The following information represents a conversation between a teacher and students during a science class. Use it to answer questions e) and f). Note that Q stands for teacher question and R for student response. Write the letters of your choices for answers.

- Q1 How are shadows made?
- R1 When there is the sun.
- Q2 How long is your shadow?
- R2 Ehmmm... I think it is 2metres.
- Q3 How can you find out?

- e) Question Q3 is;

- A Recall.
- B Convergent.
- C Divergent.
- D Rhetoric. (1)

- f) What ability would be encouraged by questions of type Q3 above?

- A Accuracy.
- B Measuring.
- C Making an hypothesis.
- D Creativity. (1)

g) The following are used by teachers to motivate students in their classrooms. Say whether each approach would be used by a humanist or behaviourist. Write the letter and the answer.

- A Students are given an exercise and whoever, completes the task earns a star.
- B Students are encouraged to work on projects during their spare time and only consult teachers for support and corrections.
- C The teacher insists on giving a variety of hands-on experiences in lessons.
- D Teacher asks difficult questions in his introduction to a lesson and punishes those students who cannot answer it. (4)

h) Study the following objectives and decide the most appropriate cognitive demand for each objective.

Pupils will be able to

- 1 Separate triangular numbers from Square numbers.
- 2 Define a set of numbers.
- 3 Reconstruct a parallelogram.
- 4 Show that line AB is equal to line C. (4)

i) What is continuous assessment (CA)? (1)

SECTION B

Answer any **three** questions from this section.

Question 2

Certain cultural beliefs, customs and social practices that learners bring to the classroom are in opposition to or incompatible with modern science. This leads to misconceptions, negative attitudes towards the study of science, and a confused psychological state of mind on the part of the learner. (Jegede, 1996)

- a) Give **two** examples of misconceptions either in science or mathematics that have been identified through research. (6)
- b) When the situation presented in the extract occurs above (i.e., a conflict between science and student beliefs, etc), a number of things may happen as students attempt to deal with the cognitive dissonance. Describe **three** of them. (9)
- c) Discuss **two** strategies one might use in the classroom to deal with student misconceptions. (10)

Question 3

One can lead a horse to the river; but you cannot make him drink...

- a) Discuss the educational ideas inherent in this statement. In your discussion, present the behaviourist and the constructivist views of motivation. (10)
- b) Mathematics is believed to be a difficult subject, thus many people shy away from it. Yet research has shown that children enter the school system with high interest in mathematics.
 - (i) Explain how motivation in mathematics might be most probably affected by the belief that mathematics is a difficult subject. (10)
 - (ii) Indicate what you might do to ensure that children's motivation in mathematics is maintained. (5)

Question 4

- a) Draw a lesson plan for a contextualised lesson of your choice that involves problem solving in Mathematics OR Science. (19)
- b) Write an essay/long answer type question and a marking guide for your lesson in (a) above. (6)

Question 5

- a) Evaluate the use of different teaching/learning resources in teaching Mathematics or Science. (10)
- b) Suppose you are a Science and Mathematics teacher in a school that is situated in a rural environment in Swaziland.
- (i) Indicate how you would go about finding teaching resources for your classes. (9)
- (ii) Compare your situation with that of a colleague who teaches in a town school. (6)

Question 6

- a) Discuss only **one** of the following:
- (i) The Zone of Proximal Development.
- (ii) Situated cognition.
- (iii) Contextualisation. (10)
- b) Show how Vygotsky's theory of learning differs from that of Piaget. (15)