

**UNIVERSITY OF SWAZILAND
FACULTY OF EDUCATION
DEPARTMENT OF CURRICULUM AND TEACHING
SUPPLEMENTARY EXAMINATION QUESTION PAPER, JULY 2014**

TITLE OF PAPER : **CURRICULUM STUDIES IN BIOLOGY II**
COURSE CODE : **EDC 378**
STUDENTS : **BEd. III, PGCE**
TIME ALLOWED : **THREE (3) HOURS**

INSTRUCTIONS:

- 1. This examination paper has five (5) questions. Answer four (4) questions only.**
- 2. Each question has a total of 25 points.**
- 3 There is an attachment for one question.**

**THIS PAPER IS NOT TO BE OPENED UNTIL PERMISSION HAS BEEN
GRANTED BY THE INVIGILATOR**

1. a) It has been suggested that sub-Saharan Africa should engage in low science instead of high science. Discuss the mitigating circumstances behind this suggestion. [10]
- b) The structure of STS courses varies depending on the goals emphasised by a particular society or community. Explain what would be the characteristic features of the following: [5x2]
- i) Course content that to a large extent places emphasis on traditional science
- ii) Course content that to a large extent places emphasis on STS science
- c) Based on the attached article “Ezulwini, E. Coli” by Zakhele Dawson, Swazi News 2011, suggest a structure for an STS science topic for a specified grade providing the proportion of STS content compared with traditional science. [5]
2. a) Explain what is meant by the following: [2x3]
- i) Gender mainstreaming
- ii) Gender responsive pedagogy
-
- iii) Gender equality
- b) Compare and contrast the goals of Female Education in Mathematics and Science in Africa (FEMSA) and Forum for African Women Educationalists (FAWE) with regards to girls' education in Africa [4]
- c) i) Explain how FAWE's Science, Mathematics and Technology (SMT) model is impacting on girls' access to, participation and performance in SMT education. [10]
- ii) Explain how FAWESWA (FAWE, Swaziland Chapter) is impacting on Gucuka High School in Swaziland. [5]
3. a) Learning in science involves the use of many scientific words and concepts. Explain how you would teach a Form 2 science class the concept of photosynthesis such that they are able to construct their own definition. [10]
- b) Compare and contrast the characteristic features of the Junior Secondary Science Curriculum and the Swaziland Integrated Science Programme. [15]
4. a) Your Head of Department in your school has given you the task of selecting a suitable Swaziland General Certificate of Secondary Education Biology textbook. Explain the criteria you would use to select such a textbook. [15]

b) Describe the factors that affect interaction between sensory information and short term memory which may interfere with learners' acquisition of science concepts. [10]

5. a) Concept mapping as an instructional technique can be used to overcome misconceptions. Explain how this can be achieved. [5]

b) Using the concepts listed below, construct a concept map showing the type of domain knowledge you would expect your Biology Form IV class to attain in this topic. The construction process should indicate the following:

1. Rank concepts according to their level of generality or specificity [5]

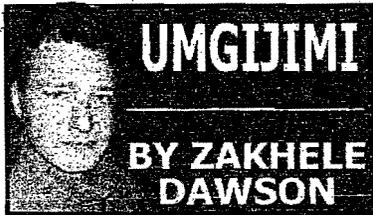
2. Cluster concepts that interrelate closely [3]

3. Arrange concepts in a hierarchical representation [7]

4. Link related concepts and label with appropriate indicators [5]

Digestion in the stomach, gastric juice, pepsin, pyloric sphincter, peristaltic movement, proteins, hydrochloric acid, protease, duodenum, gastric glands, peptides, enzyme, muscle, bacteria, stomach wall, acidic medium, chime, substrate.

Ezulwini, E.coli



I have been writing a bit about water and sanitation recently and while conducting a little research, I found some interesting figures.

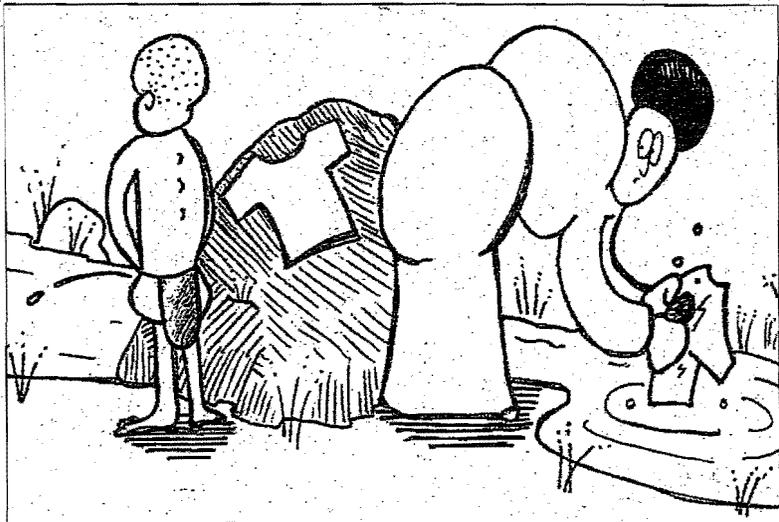
Regular readers of my column (thanks, mum!) will know that I hail from the Valley of Heaven, Ezulwini. It really is the most beautiful little valley I have ever seen but it hides a dirty little secret. Well, not so little really – the Lusushwana River runs the length of Ezulwini, watering the most beautiful real estate in the country (not to be too biased) and the people lucky enough to live there.

The Lusushwana is a home, too, to all sorts of microbes. The one I'm concerned with at the moment, or concerned about, is a little bug called *Escherichia coli*.

This is the bacterium that gives us what we colloquially call 'food poisoning'. It can be fatal. More than half of the human body is made up of water. Diarrhoea, which is the most obvious symptom of food poisoning, can dehydrate a human being to the point where the very cells of our bodies collapse in upon themselves for a lack of fluids. An insidious little creature, *E. coli*, as it's normally written, will even get sucked into plants that are watered with contaminated water. It gets into our food and attacks us. That's how it got its common name, of course.

E. coli has been mankind's enemy for so long that our immune systems can deal with some of it, if we are healthy. However, too many microbes can overwhelm us.

The recommended 'safe' level of *E. coli* bacteria in 100 millilitres of water is 1-10. A litre is 1 000 ml. That's one to 10 actual 'faecal coliforms' as they are known in



the sanitation trade. Remember this number.

The following water test readings were taken from the Lusushwana River at various points on the same day, at some time in the last three months:

From upstream to downstream:

The Ezulwini: 60 *E. coli* bacteria per 100 ml.

The Lobamba: 1 450 *E. coli* bacteria per 100 ml.

The Matsapha: 1 100 *E. coli* bacteria per 100ml.

On another day, this station recorded 1 700 *E. coli* bacteria in 100 ml of water.

That's 170 times the maximum recommended level of just these germs.

CHOOSING

What this means is that if you have any plans to drink the water from the river, or go swimming, or wash your clothes in it or anything really – don't.

The problem is, so many people living in the valley of heaven have no other option and, since it's the valley of heaven, more and more people are choosing to live there. It's getting a little crowded. Every day people can be seen fetching water, washing clothes, swimming, and generally using the river as what the NGOs call a 'primary water source'. Also, of course, they use it for a toilet. This is how the *E. coli* got into the water in the first place.

Everytime someone goes to the toilet anywhere near an open body of water, or even worse, in it, the waste that is expelled from their bodies becomes one with the water. Which really sucks for the guy downstream. When the rains come, and they always do, all that rich living waste material by the side of the river gets washed into it. When the river swells and bursts its banks, or the flood-gates are opened, it scours the land of all those germs. A river can't be both a toilet and a water source. It has to be one or the other.

So the first thing we can do to make our beautiful, deadly, river safe again is to provide proper toilets for ourselves and others. We also need better access to tap-water, which is clean. In the meantime, if we have to use the river water for washing, we need to remember to wash our hands before and after every meal. The catch here is that it only does any good if you wash with soap and running water. We could do with more of these, too. Washing hands before and after eating also helps to minimise the transfer of germs.

Oh, and if you live or use any other rivers, the same warnings apply. You should check the stats on the Umbuluzi: that sucker hit 2 000 *E. coli*/100ml one day.

'DO NOT GIVE UP, BE COURAGEOUS' (1 Kings 17)

HEALTHING

Unless you take heed or pay at...

LE

B

A

gimes by... community... those of us... advocacy... ernance... to judge the... and credit... within our... tries.

In our... though... because... land is... its... Swazian... clear about... various... of Swazian... are crucial... serve to... ple together... strive for... a society... They ident... cal leaders... link between... governments...

The second... course, the... paid to the... government... organisatio... institution... However, w... dynamic po... mocracy can... long-run. P... and politica... sometimes... by the publi... politics is a... that politic... parties are... politics is a... ultimately... public and i... of citizens... proud to be i...