

**UNIVERSITY OF SWAZILAND
FACULTY OF EDUCATION
DEPARTMENT OF CURRICULUM AND TEACHING
MAIN EXAMINATION QUESTION PAPER, DECEMBER 2014**

TITLE OF PAPER : CURRICULUM STUDIES IN BIOLOGY I
COURSE CODE : EDC 278
STUDENTS : BEd. II, PGCE
TIME ALLOWED : THREE (3) HOURS

INSTRUCTIONS:

- 1. This examination paper has five (5) questions. Question 1 is compulsory. Then answer any three (3) questions.**
- 2. Each question has a total of 25 points.**
- 3. There is an attachment, JC Syllabus Code 414, 2015-2017, page 6, for one question**

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Question 1 is compulsory.

1. a) Scientific knowledge is tentative. Explain briefly what is meant by this statement. [5]
- b) A good scientific model must be able to *explain* and *predict* natural phenomena. Using the Meiotic and/or Simple Dominance Model(s) as illustrations, show what this means. [5]
- c) Briefly discuss the merits and demerits of using open and closed test items in assessment in science. [5]
- d) Discovery learning is advantageous because it leads to i) learning the heuristics of discovery and ii) conservation of memory. Discuss what the two phrases mean. [5]
- e) Distinguish between the aims and goals of science education. [5]

Choose any 3 questions below.

2. a) Show, with illustrations, the cyclic nature of scientific process. [5]
 - b) Peter Medawar asserts that there are problems inherent in the scientific paper. Provide these and explain why Medawar considers them to be problems. [10]
 - c) A scientific paradigm, when it is viable, results in scientific progress whilst at the same time it stunts scientific progress. Explain how this is possible. [10]
3. a) A Form IV class was conducting investigations on photosynthesis. Their teacher prepared the following questions for the class:
- i) What are the raw ingredients that are used during photosynthesis?
 - ii) How can we show that a carbohydrate is formed during photosynthesis?
 - iii) Why did we remove the chlorophyll from the leaf before using iodine?

Classify each question using the questioning classification scheme and justify your classification for each question. [10]

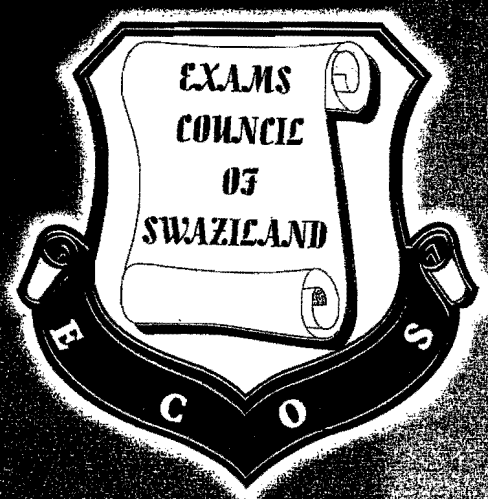
- b) The National Science Education Standards specify seven inquiry skills that must be mastered by learners when they finish high school. Select any five skills and discuss what is involved in each. [15]

4. a) Section 7 of the JC Science Syllabus 414 is attached. Outcomes p – w refer to reproduction in plants. Use them to answer i) and ii) of this question.

Mr Xaba gave his learners in Form1 definitions of the terms pollination, self-pollination, cross-pollination, and informed them that the agents of pollination are insects and wind and then showed them pictures and diagrams showing these. This was followed by a class exercise where the learners were asked to fill in blanks with missing words which were provided.

- i) Discuss the problems associated with this approach for the learners. [5]
- ii) Suggest effective ways to improve on Mr Xaba's approach. [14]
- b) Dr Rowe's research on teacher *wait time* showed that when teachers gave learners 5 seconds or more to think about their answers, the learners and teachers benefitted greatly. Provide i) 2 changes that occurred in the learners and ii) 1 change that occurred in the teachers. [6]
5. The learners in Mr Xaba's class (Q4) did not respond to his questions. In fact they were very quiet and seemed to prefer to copy his notes in their notebooks.
- a) Discuss 4 factors you would implement to increase the learners' motivation. [12]
- b) As a general guide for using tests, discuss why a teacher should never use a test as punishment. [6]
- c) Explain the importance of descriptive, criterion-based feedback for the learner compared to numerical or letter grades. [7]

EXAMINATIONS COUNCIL OF SWAZILAND



*For Examination in
October / November
2015 - 2017*

**INTEGRATED SCIENCE
CODE - 414**

JUNIOR CERTIFICATE SYLLABUS

JC SCIENCE Syllabus 414
October/November 2015 Examination

- (g) distinguish between mass and weight.
- (h) perform and describe an experiment to determine the position of the centre of mass of a plane lamina.
- (i) describe the effects of the position of the centre of mass on the stability of simple objects.
- (j) define a lever as a type of simple machine.
- (k) identify the load, fulcrum and force in a given lever.

7. **Reproduction**

All learners should be able to:

- (a) define reproduction as the production of offspring for the continuity of organisms of the same kind.
- (b) describe the secondary sex characteristics in males and females at puberty.
- (c) name the hormones responsible for the development and regulation of secondary sex characteristics at puberty.
- (d) describe:
 - the structure and function of human male reproductive system: testis, penis, scrotum, sperm duct and urethra;
 - the female reproductive system: ovary, oviduct, vagina, cervix and uterus.
- (e) describe the menstrual cycle, (hormonal control not required).
- (f) state the sperm as the male sex cell and the ovum as the female sex cell.
- (g) state that the sex cells carry information about the characteristics that are passed on from parents to their offspring.
- (h) describe:
 - sexual intercourse as the deposition of sperms into the vagina.
 - fertilisation.
 - pregnancy.
- (i) list the consequences of teenage pregnancy.
- (j) define sexually transmitted infections (STI's) as infections that are transmitted mainly through sexual intercourse.
- (k) name and describe some examples of sexually transmitted infections.
- (l) describe signs, symptoms, effects and treatment of gonorrhoea and syphilis.
- (m) describe the Human Immuno-deficiency Virus (HIV) as a virus that causes Acquired Immune deficiency Syndrome (AIDS) in human beings.
- (n) describe how AIDS develops, giving examples of opportunistic infections.
- (o) describe the methods of transmission of HIV/AIDS and how it can be prevented from spreading.
- (p) describe the flower as the reproductive organ in plants.
- (q) investigate specimen and label the following parts of an insect pollinated flower: petals, sepals, anthers, filaments, stamens, stigma, style, ovary, ovules, pistil.
- (r) define and describe pollination.
- (s) describe the two types of pollination: self-pollination and cross-pollination.
- (t) Name the agents of pollination as insects and wind.
- (u) describe the differences between insect pollinated and wind pollinated flowers.
- (v) describe the formation of the pollen tube and fertilisation. (enzymes not required)
- (w) state that the ovule develops into a seed and the ovary into a fruit.