

**UNIVERSITY OF ESWATINI
FACULTY OF EDUCATION
DEPARTMENT OF CURRICULUM AND TEACHING
RE-SIT EXAMINATION QUESTION PAPER, JANUARY 2019**

TITLE OF PAPER : CURRICULUM STUDIES IN BIOLOGY I
COURSE CODE : CTE327/527
STUDENTS : B.Ed. III, PGCE
TIME ALLOWED : THREE (3) HOURS

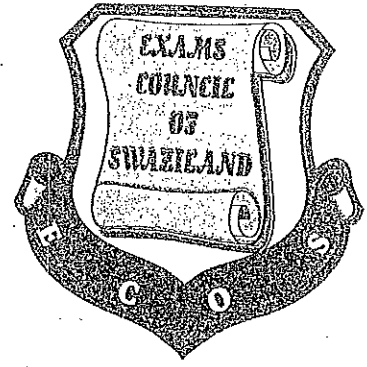
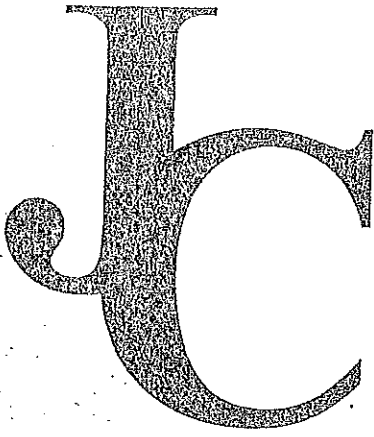
INSTRUCTIONS:

- 1. This examination paper has five (5) questions. Answer any 4 questions.**
- 2. Each question has a total of 25 points.**
- 3. There are 2 attachments i) Science in Everyday Life, Book 3 pp84-85; ii) JC Science 2018-2020 Syllabus, page 14, for 1 question**

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1. a) Show how theories and models have similar functions and how they differ. [10]
 - b) According to Thomas Khun, scientific discoveries are made through a series of scientific revolutions. Explain how this occurs. [8]
 - c) One of the requirements for knowledge to qualify as scientific knowledge is that it must be able to describe natural phenomena. Explain what this requirement entails using examples from Biology. [7]
2. a) The BSCS 5E Instructional Model specifies what the learner does in each of the 5 phases. Refer to the attached Topic, **Water in Plants**, Activity 5.2 and Section 19 of the Junior Certificate Science Syllabus, outcomes a),b) and c).
 - i) Based on the topic and Activity 5.2, suggest activities for the learners that would be in phases 1 and 2, Engagement and Exploration of the model. [10]
 - ii) Write 2 behavioural objectives in the cognitive domain for the activities in (i), include a higher level objective. [2x3]
 - iii) Write 2 instructional objectives for the activities in (i). [2x2]
 - b) Non-behavioural objectives have a place in the science classroom. Explain. [5]
3. During the first term, at 2:10 pm, new teacher Mr Motsa proceeded to his Form 1 class where he wanted to illustrate the differences between self-pollination and cross-pollination under the topic Pollination. He drew 2 diagrams on the board and informed the class that the diagrams showed the difference between the two phenomena and asked the learners to copy in their notebooks.
 - i) Critically, comment on this method of teaching [16]
 - ii) Discuss how you would introduce this topic and give reasons why. [9]
4. a) According to Jerome Bruner, inquiry and discovery teaching and learning are superior because they are associated with the following: *intellectual potency, conservation of memory, learning the heuristics of discovery, intrinsic rather than extrinsic motives*. Discuss what each entails for the learner. [4x3]
 - b) Laboratory work is important in Biology learning because it gives learners an opportunity to develop, among others, *manipulative* and *communication* skills. Discuss what each set of skills involves. [2x4]
 - c) Individual or small group laboratory work is said to be superior to teacher demonstrations. Discuss the reasons for this view. [5]
5. a) Formative assessment provides significant information for both the learner and the teacher. Discuss the role of formative assessment in teaching and learning. [10]
 - b) Research evidence suggests that as learners progress to higher grade levels, their curiosity, interest and enthusiasm about the natural world diminishes. Discuss the

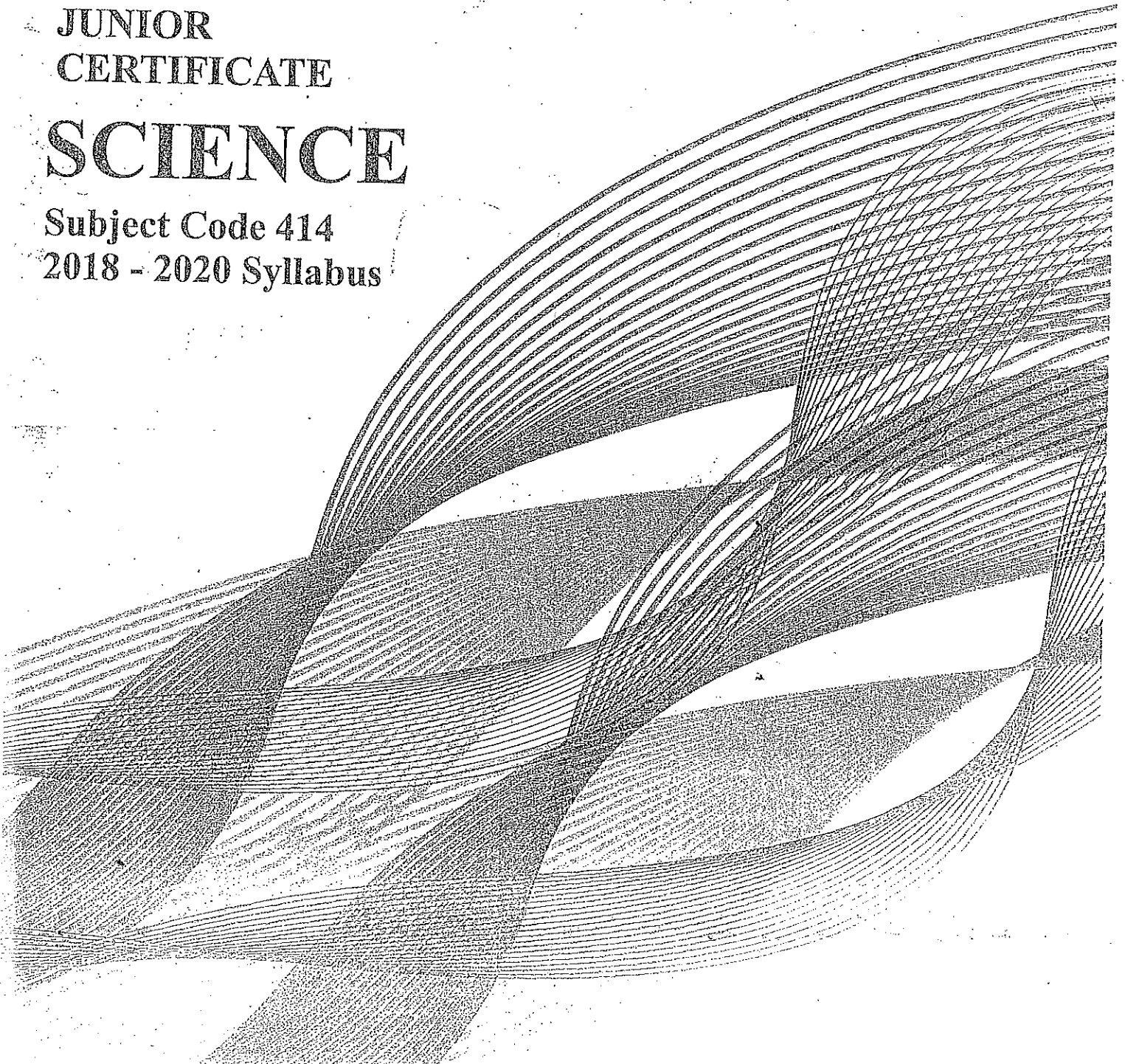
strategies you would employ to increase and sustain the interest and curiosity of a Form IV Biology class. Use concrete examples to illustrate your strategies. [15]



**JUNIOR
CERTIFICATE**

SCIENCE

**Subject Code 414
2018 - 2020 Syllabus**



JC SCIENCE Syllabus 414
October/November 2018-2020 Examinations

- (k) describe the digestion of cooked starch to maltose by salivary amylase only.
- (l) state the end products of the digestion of carbohydrates, proteins and fats.
- (m) define photosynthesis as the process of making glucose in green plants using water and carbon dioxide in the presence of light.
- (n) state the word equation for photosynthesis.
- (o) investigate and describe the conditions necessary for photosynthesis.
- (p) state that most photosynthesis occurs in the leaves.

13. Organisms in Their Natural Environment

All learners should be able to:

- (a) list the three features which enable life on Earth as water, air and energy.
- (b) state that the sun is the principal source of energy to all living systems.
- (c) define food chains as simple feeding relationships between living organisms in a given habitat through which energy is passed from one organism to the other.
- (d) construct simple food chains and describe energy flow in a food chain.
- (e) identify and describe the use of equipment for collecting specimen; nets and quadrants.
- (f) define:
 - ecology as the study of relationship of organisms with each other and their environment,
 - ecosystem as different organisms living together in a given environment and depending on each other, giving local examples.
- (g) describe, giving local examples, the terms: producer, primary consumer, secondary consumer.
- (h) state the human activities which bring about pollution: motor car exhaust, industrial/household smoke, dust from industries, insecticides, fertilizers, litter-plastics, non rotting wastes.
- (i) define conservation as maintenance and protection of a habitat or species.

14. Energy

All learners should be able to:

- (a) define energy as the ability to do work.
- (b) give examples of energy in different forms and their conversion.
- (c) investigate and describe the energy of motion (kinetic) and energy of position relative to ground (gravitational potential).
- (d) state the law of energy conservation.
- (e) list some common fuels (wood, coal, cow dung, petroleum, natural gas).
- (f) describe production of thermal energy by burning fuels.
- (g) investigate and describe qualitatively the thermal expansion of solids, liquids and gases.
- (h) describe some everyday applications and consequences of thermal expansion.
- (i) investigate convection in liquids.
- (j) describe melting and boiling in terms of energy input without change in temperature.
- (k) investigate the properties of good and bad conductors.
- (l) identify and explain some of the everyday applications and consequences of conduction, convection and radiation.
- (m) explain how a vacuum flask works.

Name the parts labelled A, B, C and D on the diagram of the urinary system. Give the function of each part you have named. Present the information in a table similar to the one below.

	Name of part	Function of part
A		
B		
C		
D		



The functions of some parts of the urinary system include:

- urethra – leads urine from the bladder out of the body
- kidneys – excrete urea, excess water and salts
- bladder – stores urine
- ureter – transports urine from the kidneys to the bladder.

Water in plants

Sipho lived on the Lowveld. He noticed that during the dry season, grass in his area does not grow and eventually dries up. The aloe plant grew well and had thick shiny green leaves. Sipho wondered why this was so. *What do you think was the reason for this?* See if you can answer Sipho's question by doing the following activity.

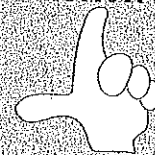
Activity 5.2

You will need the following materials:

a piece of aloe leaf, a blade of grass, a razor blade and a hand lens.

1. Cut through the aloe leaf and blade of grass using the razor blade. Record your observations.
2. Use your observations to explain why the grass plant dries up during the dry season while the aloe remains thick and shiny.
3. Describe the leaves of the plant that you would expect to:
 - (a) dry up during the dry season
 - (b) not dry up during the dry season.
4. Water is an essential requirement for plant growth.
 - (a) What is the function of water in plants?
 - (b) What happens to the water that has not been used up in both the aloe and the grass?
 - (c) How does the water get into the plant?

ACTIVITY



Both the grass and the aloe have roots that absorb water and mineral salts from the soil. The water and the minerals are used for essential processes in the plant. *Can you name one process that occurs in the plant that needs water?*

The following activity will help you understand the process that causes the grass plant to dry up during the dry season. The aloe prevents this process from occurring and stores water in its leaves.

ACTIVITY



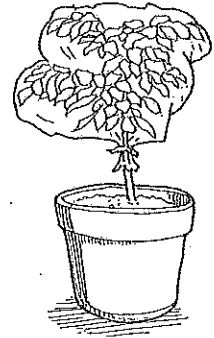
Activity 5.3

Your teacher will provide you with a pot plant, a clear plastic bag and a piece of string.

1. Cover the plant with a clear plastic bag.
2. Tie the open end of the plastic bag on the stem, enclosing all the leaves.

Your set-up should look like the one in the picture to the right.

3. Leave the plant in sunlight for about 30 minutes.



What do you see on the inside of the plastic bag? Record your observation.

The droplets of water that appeared inside the plastic bag show that the plant lost water in the form of vapour (gas). When the water vapour touched the plastic it condensed. The leaf of a plant has an upper and a lower surface. Holes called **stomata** are found on these surfaces. Water vapour escapes through these stomata. This loss of water is called **transpiration**.

Plants absorb water from the soil through their roots. The water moves up the stem through the xylem vessels until it reaches the leaves. The leaves use up some water for photosynthesis while some of the water escapes through the leaves into the atmosphere. When water is scarce, plants absorb less water than they lose. When this happens, the grass plant wilts (becomes soft and leaves droop) and eventually dries up. The aloe plant does not dry up because it is adapted (suited) for dry conditions. It does not allow transpiration to take place and stores water in its leaves.

ACTIVITY



Activity 5.4

You will need four freshly picked leaves, petroleum jelly, a string and a rod fixed in a horizontal position.