NAME OF LEARNER: _____

KZN DEPARTMENT OF EDUACTION
GREENBURY SECONDARY SCHOOL
DEPARTMENT OF MATHEMATICS AND SCIENCES
NOVEMBER EXAMINATION -2015
LIFE SCIENCES PAPER 2
GRADE 11

EXAMINER: S. SINGH **DURATION: 2,5 HOURS**
MODERATORS: K.GOVENDER, C. JUGDHAW **MARKS: 150**
DATE: 17 :11: 2015

Instructions to Learner:

1. Answer all questions.
2. Number your answers exactly as the questions are numbered.
3. Start each question on a new page.
4. Draw all diagrams in pencil and label in ink.
5. Write neatly and legibly.
6. This paper consists of **11** pages.

SECTION A

QUESTION 1

1.1. Various possible answers are given for each of the following questions. Choose the correct answer and write down only the LETTER of the correct answer.

1.1.1. Which of the following is a characteristic of wind pollinated flowers

A. Petals are brightly coloured
B. Produce nectar
C. Have a sweet scent
D. Pollen grains are light and dry

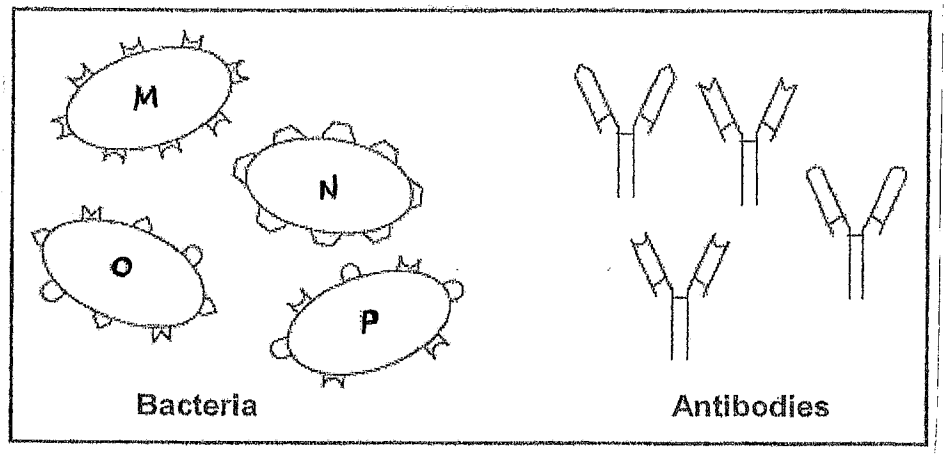
1.1.2. Which of the following statements about Gymnosperms is TRUE?

A. Has adventitious roots
B. Produce flowers
C. Root hairs are absent
D. Seed is protected in a fruit

1.1.3. A unicellular organism like *Amoeba* is different from more complex organisms because it DOES NOT ...

A. contain tissues
B. reproduce
C. respond to stimuli
D. contain chromosomes

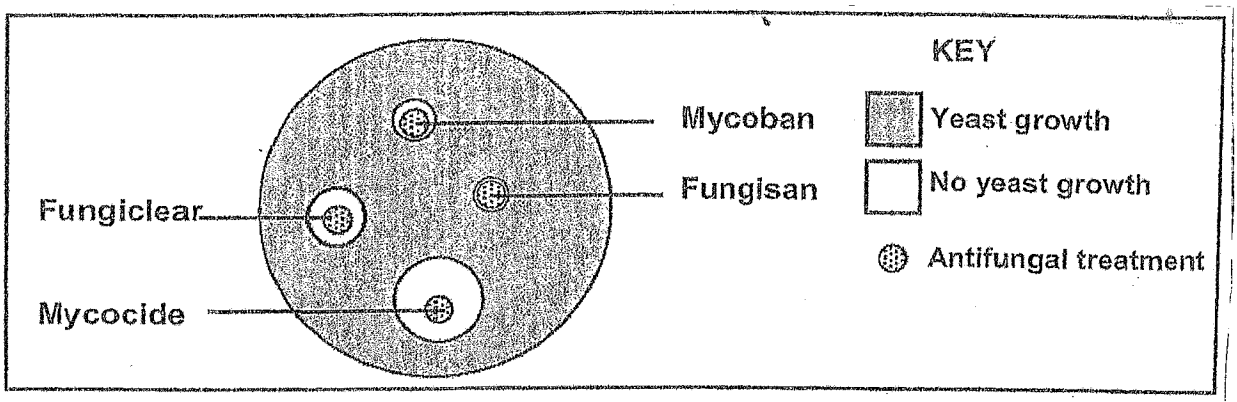
1.1.4. A young woman stepped on a dirty, rusty nail. The diagrams below show bacteria isolated from the wound and a range of antibodies that were already present in her body. The antibodies have a specific shape that binds with the antigen found on the surface of the bacteria.



The bacterium most likely to cause a severe infection is ...

A. M.
B. N
C. O
D. P

1.1.5. An investigation was carried out to test the effectiveness of four antifungal treatments on preventing the growth of yeast. The results are shown in the diagram below.



Which ONE of the following conclusions can be made from the results?

A. All the antifungal treatments are equally effective.
B. All the antifungal treatments are ineffective.
C. Mycocide is most effective and Fungisan is least effective.
D. Fungisan is more effective than fungiclear

1.1.6. An advantage of an exoskeleton ...

A. It is impermeable to gases
B. It prevents dehydration
C. It restricts growth
D. The animal cannot move quickly

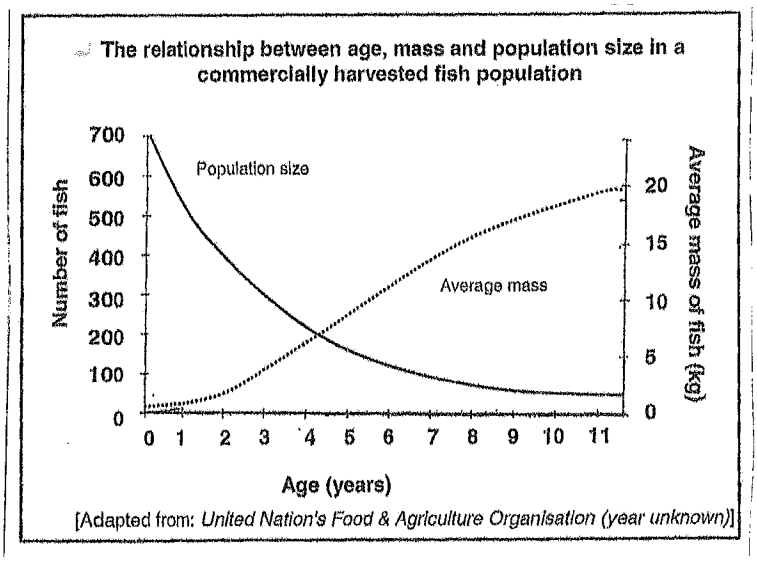
1.1.7. The following are characteristics of different plant groups:

1 Vascular tissue
2 Seeds
3 Flowers
4 True leaves and roots

The characteristics found in angiosperms are ...

A. 1, 2, 3 and 4.
B. 1 and 4.
C. 1, 2 and 4.
D. 2, 3 and 4.

For QUESTIONS 1.1.8 and 1.1.9 refer to the graph below, taken from the United Nation's Food and Agriculture Organisation (FAO) report.



[Adapted from: *United Nation's Food & Agriculture Organisation (year unknown)*]

1.1.8. Which of the following represents the age range during which the fish mortality (death) was the greatest?

A. 1 to 3 years
B. 3 to 5 years
C. 5 to 7 years
D. 7 to 9 years

1.1.9. To prevent over-exploitation of the fish population, fish should only be harvested after they have reached an average mass of 10 kg. From which age should the fish be harvested?

A. 3,5 years
B. 4,5 years
C. 5,5 years
D. 6,5 years

1.1.10. Which of the following illnesses may be caused by pollution?

(i) Allergies
(ii) Asthma
(iii) Cancer
(iv) Polio

A. (i), (ii) and (iv)
B. (i), (ii) and (iii)
C. (ii), (iii) and (iv)
D. (i) and (iv)

10 X 2 = 20

1.2. Give the correct biological term for each of the following statements.

1.2.1. An organism that carries a disease without being affected by it.
1.2.2. A type of reproduction that involves the fusion of gametes.
1.2.3. A drug formed from living organisms (usually bacteria or fungi) which stops or slows down the growth of disease -causing microbes.
1.2.4. The phase in the life cycle of plants where gametes are produced.
1.2.5. The type of skeleton where the muscles act against fluids to bring about movement.
1.2.6. An organism without a true nucleus.
1.2.7. A plant body which is not differentiated into true roots, stems and leaves.
1.2.8. A virus that attacks a bacterium.
1.2.9. A gut which has two digestive openings.
1.2.10. A measure of the total amount of greenhouse gas emissions by an individual, company or a country per year.

10

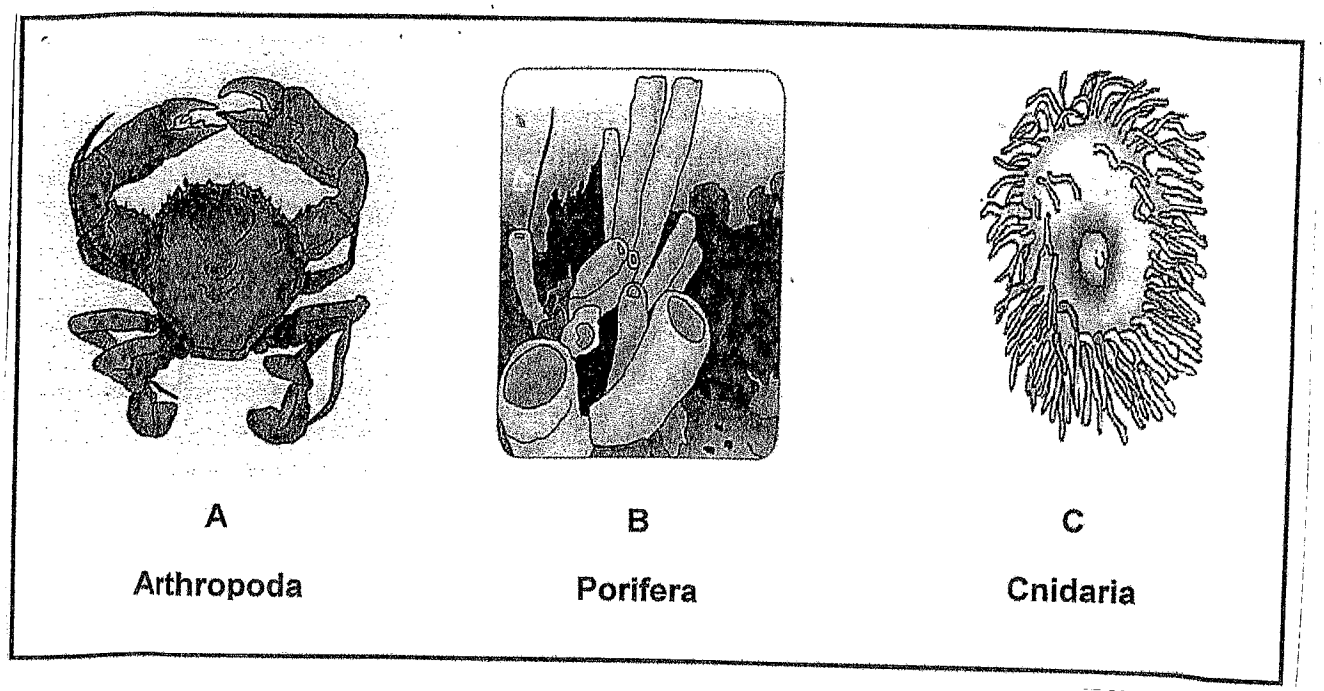
1.3. Indicate whether each of the statements in COLUMN I applies to **A ONLY, B ONLY, BOTH A and B or NONE** of the items in COLUMN II. Write **A ONLY, B ONLY BOTH A and B** or **NONE** next to the question number.

COLUMN I	COLUMN II
1.3.1. All organisms of this phylum are sessile.	A. Porifera B. Chordata
1.3.2. Greenhouse gases	A. Carbon Dioxide B. Methane
1.3.3. Part of seed which provides nutrients for germinating embryo	A. Testa B. Endosperm
1.3.4. Disease caused by a virus	A. Cholera B. Athlete's foot
1.3.5. The body's inherent ability to produce antibodies and fight diseases	A. Natural immunity B. Aquired immunity

10

PTO/ pg5

1.4. Study the diagram, representing three animals and answer the questions that follow.



1.4.1. State the type of symmetry in organism:

a) A
b) B
c) C (3)

1.4.2. Write down the LETTER representing the animal that...

a) has an exoskeleton (1)
b) has cephalisation (1)
c) possesses a blind gut. (1)
d) filter feeds (1)
e) possesses stinging cells (1)
f) has a coelenteron (1)
g) has no tissues or organs present (1)

(10)

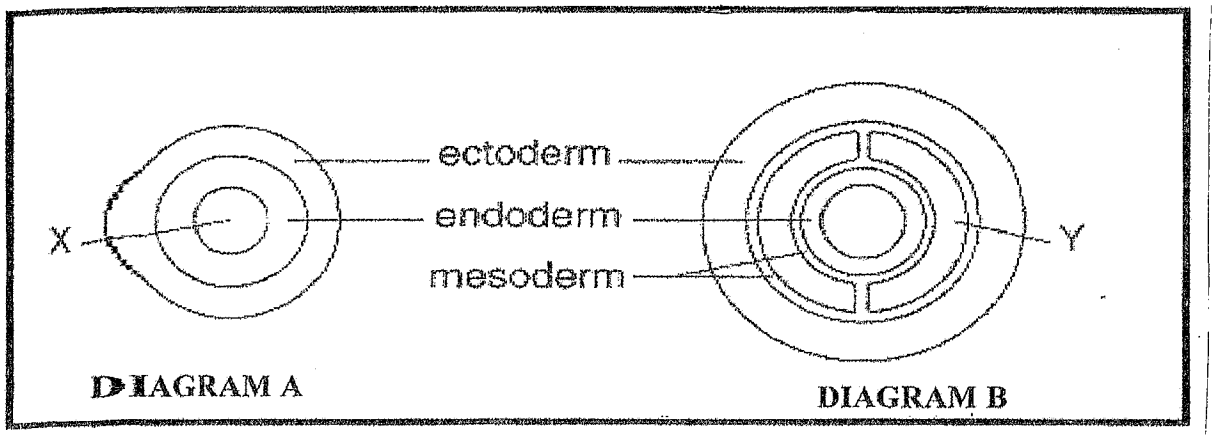
SECTION A TOTAL 50

SECTION B

QUESTION 2

2.1. Scientists often use features of morphology (external and internal structural characteristics) as well as development, to classify animals into various groups. The animal groups are defined, on the basis of their body symmetry and body plans.

Study the diagrams below and answer the questions that follow.



2.1.1. Identify the body plans represented by:
a) Diagram A
b) Diagram B. (2)

2.1.2. Provide a label for part Y. (1)

2.1.3. State TWO functions of the part that you labelled in question 2.1.2. above. (2)

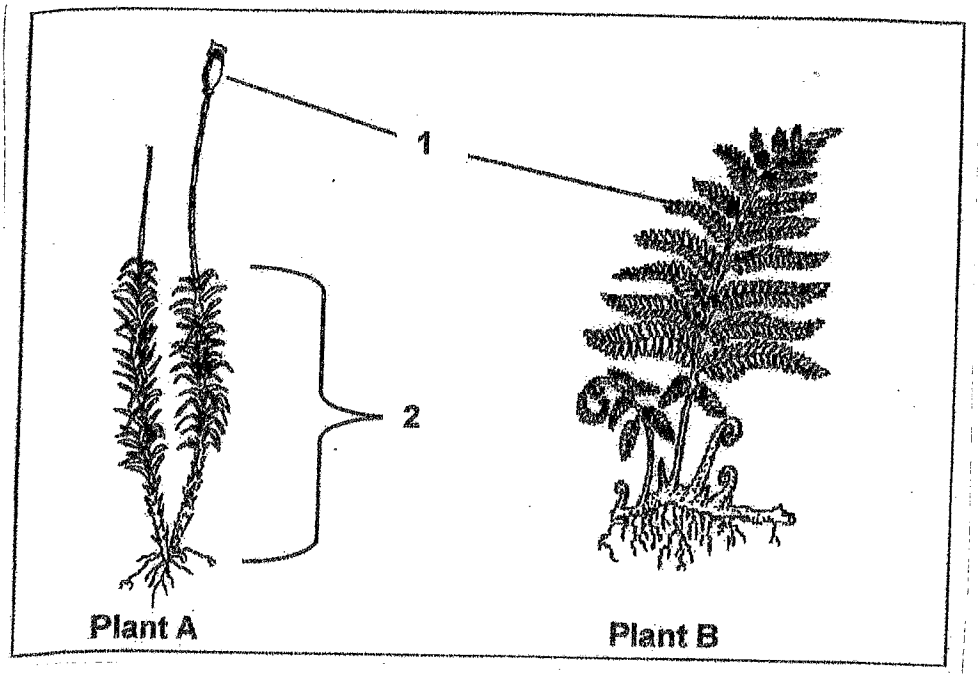
2.1.4. Describe TWO significances of a through gut in organisms. (2)

2.1.5. Scientists often use the body plans of animals to determine its level of complexity. Rearrange the following animal groups from the most primitive (simple) to the most complex (advanced): Write down only the LETTER of the correct answer next to the question number.

a) Platyhelminthes
b) Annelida
c) Cnidaria (3)

(10)

2.2. Study the diagram below and answer the questions that follow.



2.2.1. Identify the plant group to which each of the following belong:
a) Plant A
b) Plant B (2)

2.2.2. Which numbered structure in plant A is haploid. (1)

2.2.3. Name the structure that produces spores in plant B. (1)

2.2.4. Explain briefly why both plants A and B above require cool, damp conditions as an ideal environment to live in. (2)

2.2.5. List FOUR features that appeared during the evolution of plants that were adaptations to a terrestrial mode of life. (4) **(10)**

2.3. The table below shows the amount of solid waste generated in a town and that was disposed of in landfill sites over a period of six years.

YEAR	1999	2000	2001	2002	2003	2004
TOTAL SOLID WASTE (TONS)	255	276	300	330	388	428

2.3.1. Describe the trend with regards to solid waste production in this town. (1)

2.3.2. In which year was the solid waste generated the highest? (1)

2.3.3. List TWO strategies that could be used by municipalities to slow the rate at which solid waste is generated in the town. (2)

2.3.4. One problem associated with landfills is leaching. Explain what is meant by this term. (2)

2.3.5. Tabulate ONE difference between biodegradable and non-biodegradable substances and give one example of each. (4) **(10)**

PTO /Pg8

2.4. Decomposition is caused by micro-organisms that occur freely in soil as well as inside organisms. A scientist wants to investigate the decomposition of leaves in three different cubes. All three cubes have the same volume (1000 cm^3) and are buried in the soil. He designs an experiment that lasts for twelve months, where he determines the percentage decomposition in each cube (A, B, and C) every month.
Cube A consists of a wooden frame covered with porous material, eg. muslin, while cube B is made of pine wood and cube C is made of glass.

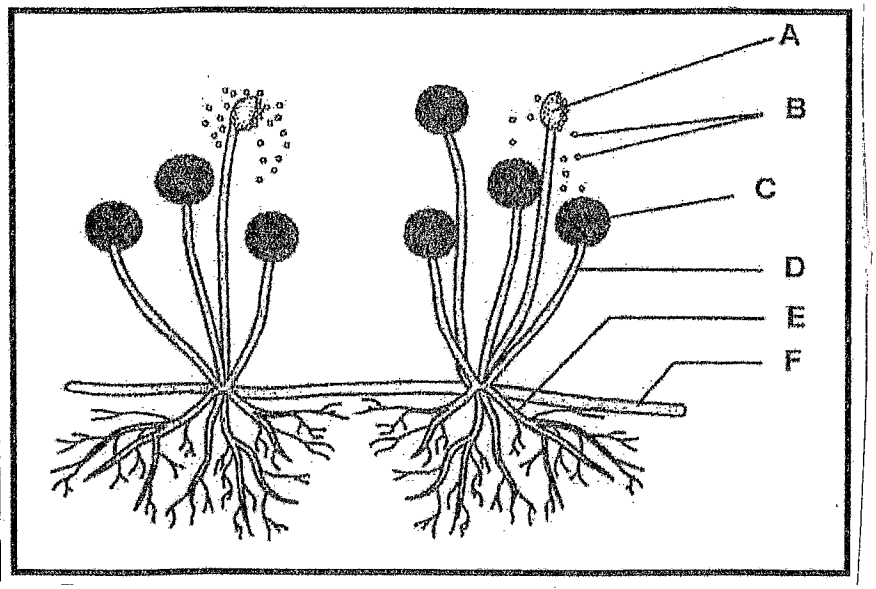
MONTHS	% DECOMPOSITION		
	Cube A	Cube B	Cube C
January	0	0	0
February	20	5	0
March	50	10	0
April	70	20	1
May	85	20	2
June	90	20	2
July	90	23	3
August	92	25	2
September	93	28	2
October	91	30	2
November	93	32	5
December	93	35	5

2.4.1. Write e HYPOTHESIS for the above investigation. (2)
2.4.2. Identify the following variables:
a) Independent (1)
b) Dependent (1)
2.4.3. In which cube did the fastest decomposition of leaves occur? (1)
2.4.4. How did the scientist ensure that the results of his investigation was valid? (1)
2.4.5. Draw and label a generalised structure of a bacterium. (4)
(10)

[40]

QUESTION 3

The following diagram shows one of the changes in the growth of a fungus.



3.1.1. Provide labels for parts C and E. (2)

3.1.2. State the function of part labelled B (1)

3.1.3. State the type of nutrition that occurs in the above organism. Give a reason for your answer. (2)

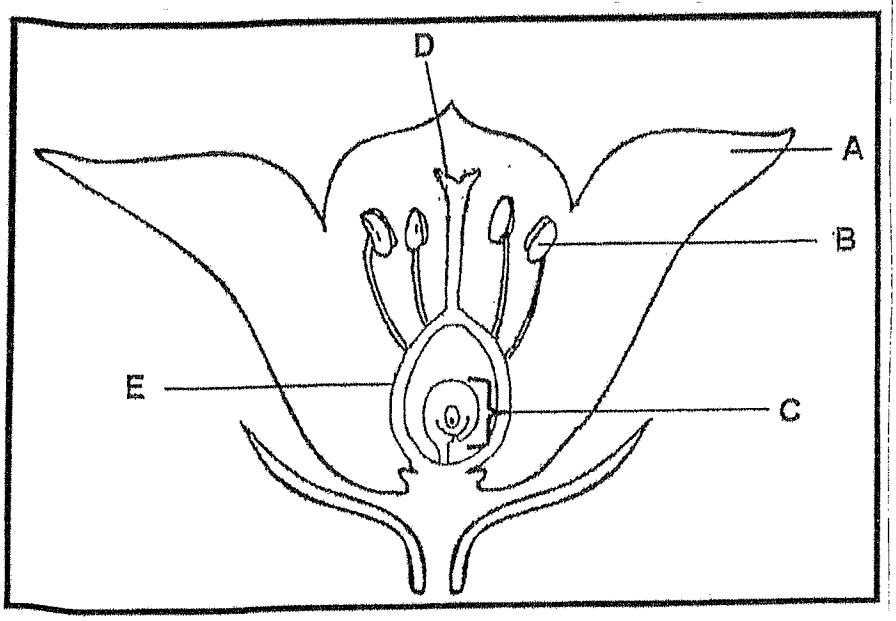
3.1.4. Name TWO suitable conditions for the rapid growth of the above fungus. (2)

3.1.5. Explain one use of fungi in medicine. (1)

3.1.6. Discuss the economic importance of fungi. (3)

(11)

3.2. Study the diagram of a flower and answer the questions that follow on page 10.



PTO/ pg 10 3.2.1.

3.2.1. Provide labels for parts A,B and D. (3)
3.2.2. State ONE function of the part labelled B . (1)
3.2.3. Define the term pollination (2)
3.2.4. What do the following structures develop into after fertilization?
a) C (1)
b) E (1)
3.2.5. State THREE reasons why plants become so endangered that their seeds need to be stored. (3)
3.2.6. Explain how seeds of gymnosperms differ from the seeds of angiosperms (2)
3.2.7. State ONE significance of seeds as a source of food. (1) **(14)**

3.3. The Human Sciences Research Council (HSRC) conducted a survey on food security across the provinces. The result showed that the overall percentage of food- secure households in South Africa is 45,6 as opposed to 48 in 2008.
The results showing the percentage of food insecure households in each province according to the latest survey are shown in the table below.

Province	Percentage of food insecure households.
Eastern Cape	36
Limpopo	31
Mpumalanga	30
Free State	29
KwaZulu natal	28
Northern cape	21
Gauteng	19
Western cape	16

3.3.1. What is meant by food security? (2)
3.3.2. Use the data in the table to draw a bar graph for the four provinces that have the highest percentage of food insecure households. (7)
3.3.3. State how the use of fertilizers by farmers can:
a) Increase food security for a country (1)
b) Decrease food security for a country. (1)
3.3.4. State how the use of pesticides by farmers can:
a) Increase food security for a country (1)
b) Decrease food security (1)
3.3.5. State TWO factors, other than the use of fertilizers and pesticides which may have led to a decrease in the percentage of food secure households in South Africa since 2008. (2)
(15)

[40]
SECTION B TOTAL: 80

SECTIONC

ESSAY

It has been found that as many as 2 billion people won't have sufficient access to clean water by 2050. That figure is expected to rise to 3.2. billion by 2080- nearly tripling the number of people who now do without water.

Write an essay describing the factors that may influence the availability of water and the factors that may influence the quality of water.

Content 17
Synthesis 3
Total 20

NOTE: NO marks will be awarded for answers in the form of flow charts or diagrams.

SECTION C : 20

GRAND TOTAL 150

GREENBURY SECONDARY SCHOOL
DEPARTMENT OF MATHS & SCIENCES
H.O.D. MR L. PILLAY
.....
10/10/2015

MEMORANDUM

NOVEMBER EXAMINATIONS --2015

LIFE SCIENCES PAPER 2

SECTION A

QUESTION 1

1.1.1. D
1.1.2. C
1.1.3. A
1.1.4. B
1.1.5. C
1.1.6. B
1.1.7. A
1.1.8. A
1.1.9. C
1.1.10. B
(20)

1.2.1. vector
1.2.2. sexual
1.2.3. antibiotic
1.2.4. gametophyte
1.2.5. hydrostatic
1.2.6. prokaryote
1.2.7. thallus
1.2.8. bacteriophage
1.2.9. through gut
1.2.10. carbon footprint
(10)

1.3.1. A only
1.3.2. Both A and B
1.3.3. B only
1.3.4. None
1.3.5. A only
(10)

1.4.1. A. Bilateral B. Asymmetrical C. Radial

1.4.2. a) A
b) A
c) C
d) B
e) C
f) C
g) B
(10)

TOTAL 50

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DEPARTMENT OF MATHS & SCIENCES
H.O.D. MR L. PILLAY
10/11/2015

SECTION B
QUESTION 2

2.1.1. A - Diploblastic √ B - Triploblastic √ **(2)**
2.1.2. Y -- Coelom √ **(1)**
2.1.3. * It allows for materials to diffuse rapidly √ through the fluid in the coelom to body fluids **ANY 2 (2)**
* Serves as a hydrostatic skeleton √
* Allows for organs to develop √
* Separates gut from body wall √

2.1.4. * Allows for specialization of different √ parts of digestion system
* The ingestion , digestion and egestion √ are systematic processes **ANY 2 (2)**
* No mixing of digested and undigested food √

2.1.5. C, A, B **(3)** **(10)**

2.2.1. A -- Bryophyte √ B -- Pterophyte √ **(2)**
2.2.2. 2 √ **(1)** 2.2.3. Sporangia √ **(1)**
2.2.4. The sperms √ of both plants depend on water in order to swim to the ova √ **(2)**

2.2.5. * Presence of roots to absorb water from the soil √
* Presence of Xylem and phloem / vascular tissue for transport of water √ / food √
* Leaves covered with waxy cuticle to prevent dessication √
* Stomata on leaves for gaseous exchange
* Not dependent on water for fertilization **ANY 4** **(4)**
* Seeds dispersed by land animals √ / wind √
* spores dispersed by wind

(10)

2.3.1. As the years increase, the amount of solid waste produced also increases. √ (1)
2.3.2. 2004 √ (1)
2.3.3. * Encourage / educate people to/ about recycling √
* Educate people about landfill sites √
* Have varying municipal waste disposal tariffs based on the non-recyclable waste. ANY 2
* Charge people according to the amount of waste produced , for removal. (2)
* Teach people how to build their own compost heaps.
* Fine people who dump their waste incorrectly.

2.3.4. When the soluble by-products/toxins from decaying √ wastes leak into the soil and enter the ground water. √ (2)

2.3.5.

BIODEGRADABLE	NON-BIODEGRADABLE
The ability of a substance to be broken down into simpler substances by natural process of decay √	The inability of a substance to break down into simpler substances by natural process of decay √
Eg. paper/ fruit / veg √	Eg. plastic/ glass/ rubber √ (4)

2.4. 1. Decomposition will occur faster √ / slower in Cube A √ / Cube B / Cube C (2)

2.4.2. a) Cube A/B/C √

b) % decomposition √ (2)

2.4.3. Cube A √ (1)

2.4.4. He used the same volume cubes. √/

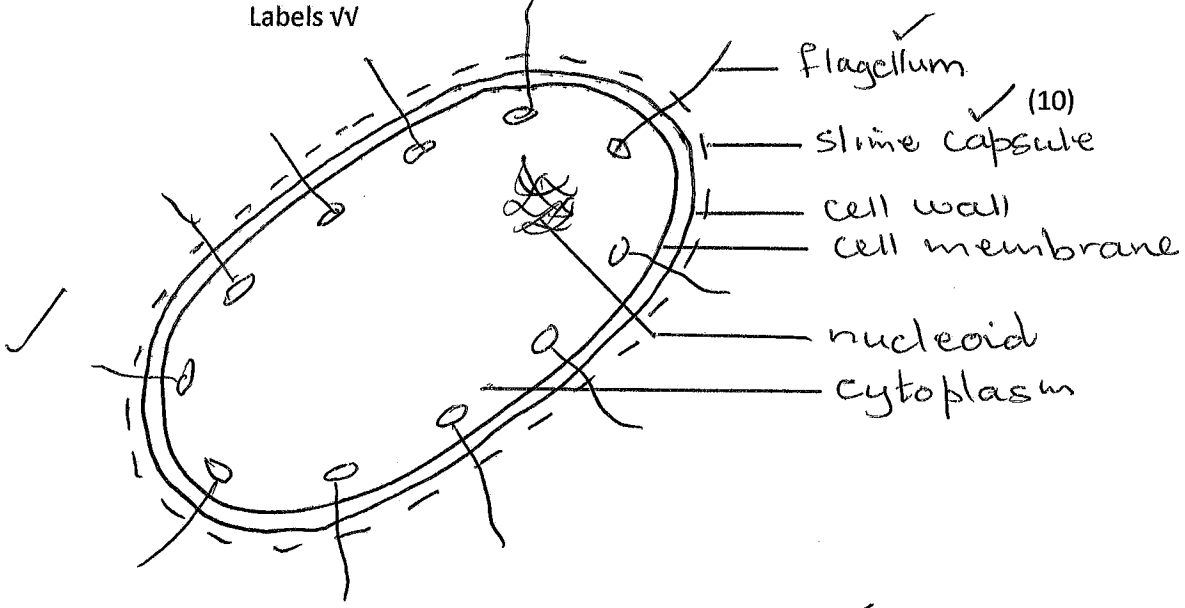
Time was the same in all 3 cubes any 1 (1)

2.4.5.

Caption √

Correct diagram √ (4)

Labels √√



(10)

Generalised Structure of Bacterium.

[40]

QUESTION 3

3.1.1. C - Sporangium √ E - Rhizoid √ (2)

3.1.2. Germinates into new mycelium / reproduction. √ (1)

3.1.3. Saprophytic √
Feeds on decaying material √ (2)

3.1.4. dark √ / warm√ / moist (2)

3.1.5. used to make antibiotics to treat certain illnesses. √ (1)

3.1.6. Source of food √
used in cheese making √
Yeast used in bread making √
Yeast used in beer and wine making √ ANY 3 (3) (11)

3.2.1. A -- petal √ B -- Anther √ D -- Stigma √ (3)

3.2.2. Produces pollen grains √ (1)

3.2.3. Transfer of pollen from the anther √ to stigma √ of flower (2)

3.2.4. C-- seed √ E -- fruit √ (2)

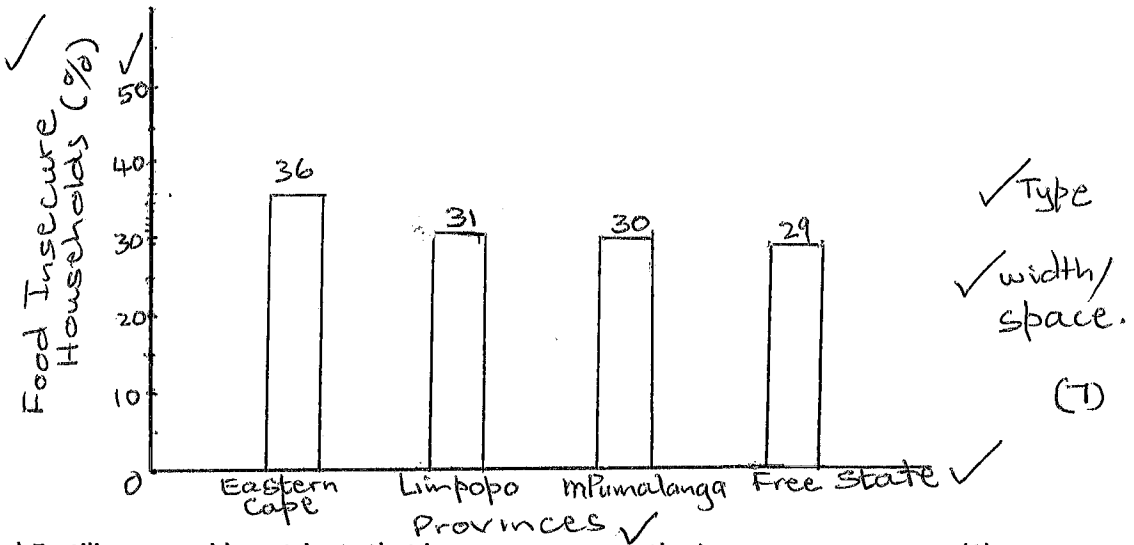
3.2.5. * habitat destruction √ (3)
* climate change √
* outbreak of disease √ ANY 3
* poor agricultural practice

3.2.6. Gymnosperms seeds are naked √
angiosperm seeds are protected in a fruit. √ (2)

3.2.7. cereals serve as a source of energy √ (1) (14)
Nuts and beans serve as a source of protein
Nuts serve as a source of oil

3.3.1. Having access to enough food √ on a daily basis so as to ensure healthy living √ (2)

3.3.2. Bar graph showing percentage of food insecure households in 4 provinces ✓



3.3.3. a) Fertilizers provide nutrients that increase crop growth. √ (1)

b) Fertilizers are expensive - causes food prices to increase √/
overuse can deprive soil of oxygen which will reduce crop production. (1)

3.3.4. a) Pesticides ensure that pests do not cause large scale damage to crops √ (1)

b) Pesticides could kill pests as well as their predators - hence more pesticides would have to be used , raising the cost of food. √ (1)

3.3.5. massive unemployment in the country √
increase in size of human population √ (2)
farms destroyed for development
decrease in subsistance farming
prolonged unfavourable environmental conditions **(15)**

ESSAY

Availability of water

- Increased temperatures✓ cause a high level of evaporation✓ from many water sources thus decreasing the amount of water available
- The construction of additional dams✓ can assist greatly in increasing the quantity of water stored✓.
- The conservation of our wetlands✓ are important in that they provide water for domestic and livestock use as well as for irrigation✓. The vegetation in the wetlands also helps in purifying the water naturally✓
- A large amount of water used for irrigation is lost✓ due to poor farming practices. Open drain irrigation leads to loss of water by evaporation✓. The use of water for irrigation further up a river✓ decreases the availability of water for other users lower down in the river✓. Ploughing downhill instead of in contours✓ causes loss of water through rapid drainage✓
- The use of fertilizers and pesticides✓ have also decreased the amount of clean water available, thus increasing costs involved in purification✓
- Exotic plants often have deep rooting systems✓ that obtain water from deep down in the water table. This reduces the amount of water available✓
- Boreholes✓ have been used in areas that do not have direct access to other sources of water✓
- A certain amount of water is available free✓ to all citizens.
- Availability is also affected by wastage✓ of water through leaking taps and toilets and faulty pipelines✓.
- Wastage of water can be reduced by reducing the pressure in the pipes✓, by educating wiser use of water✓ and by maintaining all plumbing in good condition✓.

Quality of water

- Water used for domestic purposes contains detergents and pathogenic bacteria in sewage✓. This water has to be treated before it gets into the water course✓
- Improper sanitation✓ increases the chances of water being polluted and hence increases the chances of water-borne diseases✓
- Water used for industrial purposes may contain many heavy metals, oil, heat and fertilizers✓. This adversely affects the quality of the water
- Water used for agriculture my contain pesticides and herbicides and fertilizers✓ which pollute the water causing eutrophication✓. The oxygen level in the water is decreased thus reducing the potential for life in such water✓
- Water returned to the environment from mines✓ is generally acidic and toxic✓. This water is hot and thus contributes to thermal pollution✓. Thermal pollution also reduces the availability of oxygen in the water✓.
- Alien invasive water plants✓ clog the waterways, reducing light to other aquatic plants✓. These plants die and decompose✓. The bacteria deplete the oxygen supply in the water✓

Content (17)
Synthesis (03)
(20)

Assessing presentation of essay (Synthesis)

RELEVANCE	LOGICAL SEQUENCE	COMPREHENSION
All information provided is relevant to the topic	Ideas arranged in a logical/ cause- effect sequence	Answered all aspects required by the essay
All information relevant to factors that influence availability of water and quality of water only	All factors are mentioned and explained logically	3/6 factors mention and explained for availability of water 3/5 factors mentioned regarding quality of water
1 MARK	**1 MARK**	**1 MARK**