Hillcrest High School

Grade 11

Life Science Exam

June 2017 **Examiner: Mr Mahabeer**

Time : 2 ½ hours **Marks : 150**

Instructions:

1. **Write your Life Science Teachers name on all the booklets**
2. **Number your answers exactly as the questions are numbered**
3. **Write neatly and legibly**
4. **Do all drawings in pencil and label in ink**
5. **Only draw diagrams and flow charts when requested to do so**
6. **This paper consists of 11 pages**

SECTION A
QUESTION ONE

Various possible options are provided as answers to the following questions. Choose the correct answer and write only the letter (A-D) next to the question number (1.1.1-1.1.10) in your answer book, for e.g. 1.1.11 C

1.1.1 Viruses...

A. Occur in water only
B. Are living Unicellular organisms
C. Cause disease
D. Cause the decay of food

1.1.2 A bacterium cell is…

A. Is a prokaryote
B. Has a nuclear membrane around its genetic material
C. Is a eukaryote
D. Contain mitochondria, vacuoles and plastids in the cytoplasm

1.1.3 A disease caused by a protist is

A. Flu and colds
B. TB
C. Ringworms
D. Malaria

1.1.4 A typical habitat of Rhizopus is

A. Damp, shady soil
B. On living organisms
C. In a bacterial cell
D. Dead, organic matter

1.1.5 A leafy moss plant…

A. Is a thallus
B. Contains no chlorophyll
C. Is a semi-parasite
D. Produces spores

1.1.6 All flowering plants are classified as…

A. Conifers
B. Gymnosperms
C. Spermatophytes
D. Angiosperms

1.1.7 The skeleton of a Hyrda is…

A. An exoskeleton
B. An axial skeleton
C. A hydrostatic skeleton
D. Appendicular skeleton

1.1.8 Which of the following factors will have little or no effect on the rate of photosynthesis?

A. A decrease in light
B. Increase in oxygen content of the atmosphere
C. Decrease in environmental temperature
D. Increase in carbon dioxide level in the atmosphere

1.1.9 In which of the following are digestive enzymes absent:

A. Bile
B. Saliva
C. Gastric juice
D. Pancreatic juice

1.1.10 The products formed during fermentation in plant cells are:

A. Alcohol and water
B. Lactic acid and alcohol
C. Alcohol and carbon dioxide
D. Carbon dioxide and lactic acid

[10 X 2 =20]

1.2. Give the correct BIOLOGICAL TERM for each of the following descriptions. Write only the term next to the question number (1.2.1 to 1.2.10) in the answer book.

1.2.1 A disease causing parasite like bacteria.

1.2.2 The network of hyphal threads in a fungus.

1.2.3 A group of sporangia usually on the underside of a frond.

1.2.4 A ripened ovule.

1.2.5 The whorl of stamens in flowering plants.

1.2.6 A fluid filled cavity between the gut and the body wall of the earthworm.

1.2.7 The part of the cell where the Krebs cycle occurs.

1.2.8 The end product of protein digestion.

1.2.9 The main photosynthetic tissue in an angiosperm leaf.

1.2.10 Process by which ingested harmful, poisonous substances are rendered harmless in the liver.

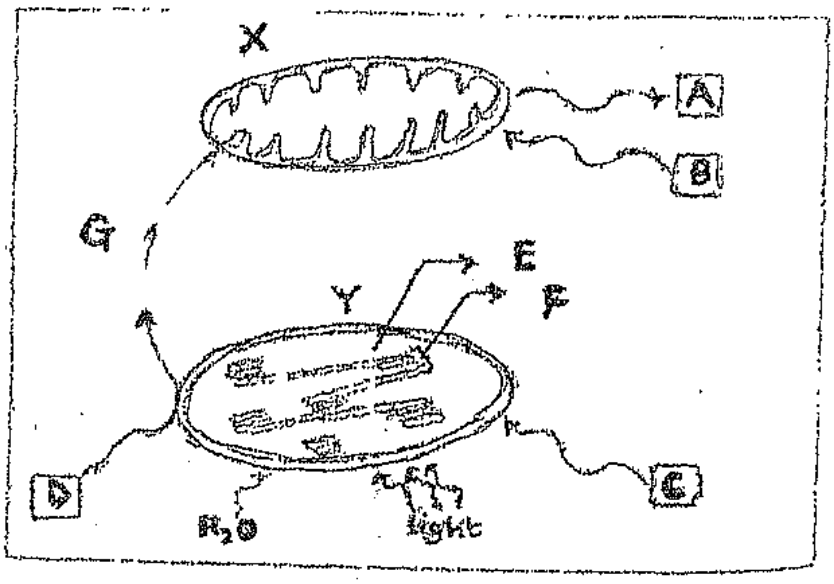
[10 X 1=10]

1.3 Indicate whether each of the statements in COLUMN 1 applies to A ONLY, B ONLY, BOTH A & B or NONE of the items in COLUMN 11. Write A only, B only, both A and B or None next to the question number (1.3.1 to 1.3.10) in the answer book

	COLUMN 1	**COLUMN 11**
1.3.1	A microscopic organism that occurs as coccus, spirillum or bacillus form	A. Virus B. bacteria
1.3.2	Binary fusion is a method of reproduction that generally occurs in…	A. bacteria B. unicellular organisms
1.3.3	The microsporangia in flowering plants.	A. pollen sac B. ovary
1.3.4	Body radially symmetrical	A. amoeba B. locust
1.3.5	Compound glands between the villi of the duodenum.	A. goblet cells B. Brunner's gland
1.3.6	Organic molecules which control metabolic reactions.	A. Enzymes B. Amino acids

[6X1=6]

1.4 **<u>STUDY THE DIAGRAM BELOW OF THE TWO ORGANELLES AND ANSWER THE QUESTIONS SET.</u>**



1.4.1 Identify the organelles X and Y **(2)**
1.4.2 Which metabolic process is associated with each of the organelles X and Y? **(2)**
1.4.3 Identify the parts labelled E and F. **(2)**
1.4.4 Identify the gases A and D which are taken in or given off as indicated by the direction of the arrows. **(2)**

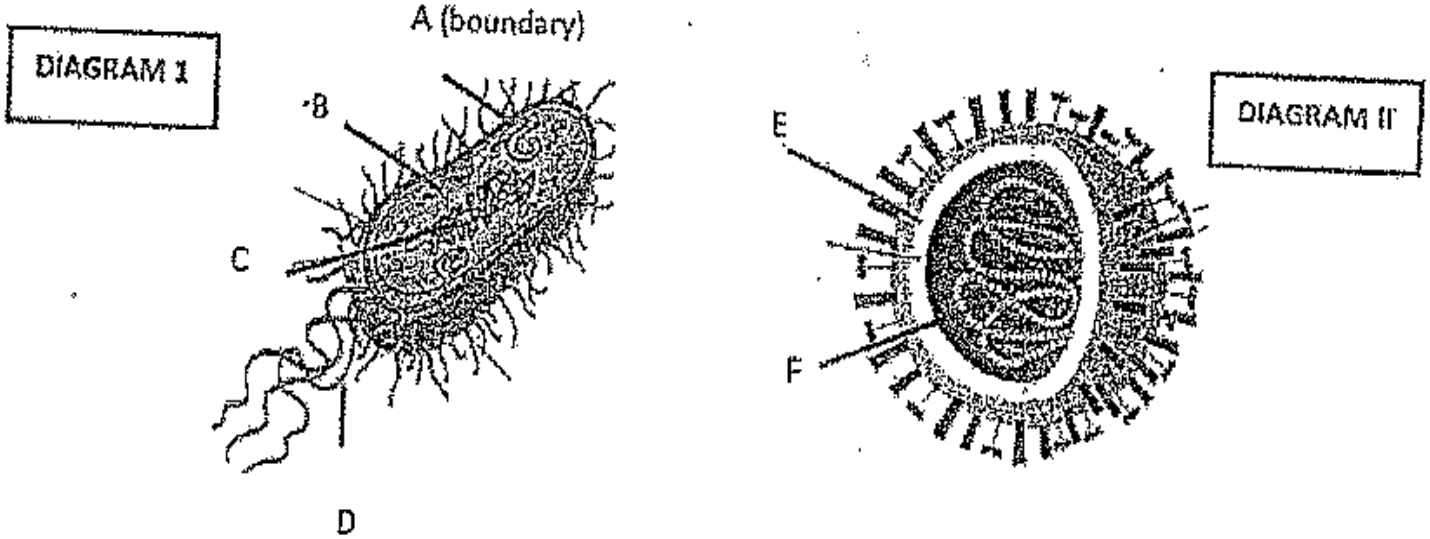
[8]

1.5 Draw and label a diagram of a typical bacteria. **(6)**
(Use all the diagram rules you have been taught)

TOTAL SECTION A = 50

SECTION B
QUESTION TWO

2.1 Study the diagram showing two micro-organisms and answer the questions which follow.



2.1.1 Write the letter only of the part representing the:
a. DNA material
b. Protein coat **(2)**

2.1.2 State the type of reproduction that takes place in the organisms in Diagram I **(1)**

2.1.3 List two ways in which organisms in Diagram II differs from living cell. **(2)**

2.1.4 Which diagram (I or II) shows an organism that could cause tuberculosis. **(1)**

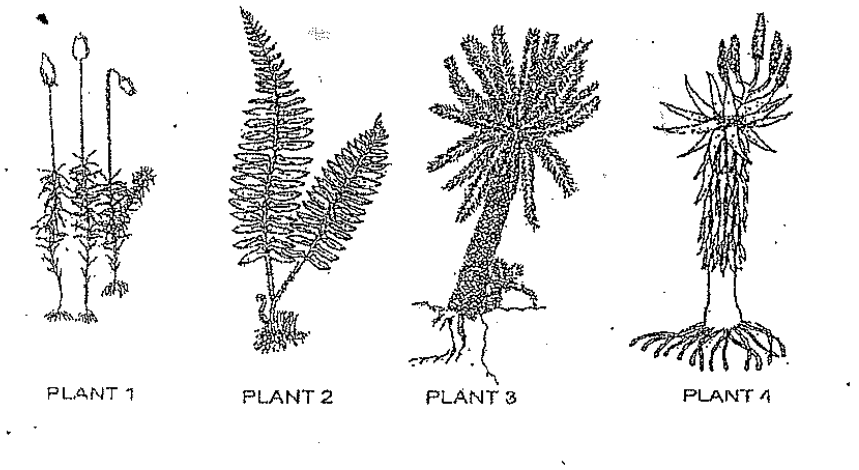
2.1.5 Name the type of medication that is used to destroy organisms represented by diagram I in the human body. **(1)**

2.1.6 Medication mentioned in question 2.1.5 is ineffective against diseases caused by the organisms in diagram II.
Explain why this medication is still given to people suffering from the diseases caused by organisms in diagram II **(2)**

2.1.7 List two ways in which the government could improve public health and prevent deaths due to disease like tuberculosis. **(2)**

[11]

2.2 Study the diagram below and answer the questions that follow



2.2.1 Identify the plant groups 1 to 4 shown above. **(4)**

2.2.2 The following table shows a comparison of various evolutionary developments of plants

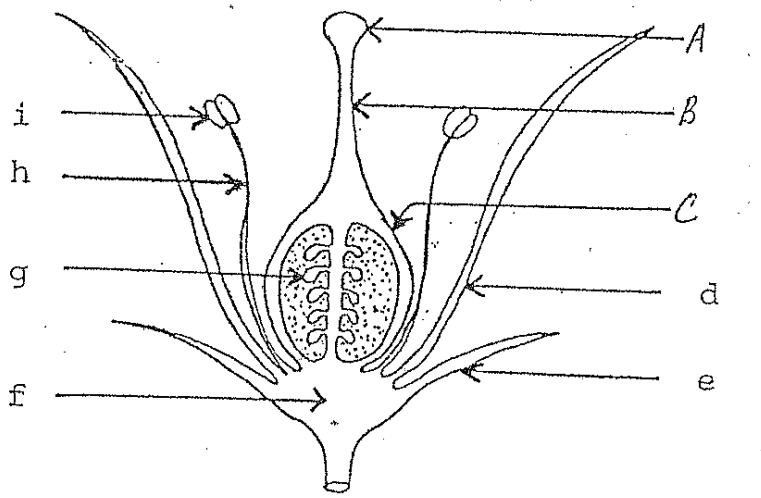
(1-4) complete the table by writing the missing characteristic next to the appropriate letter

(A-F) in the answer book

	Vascular Tissue	**Roots, stem and leaves**	**Reproductive structures**	**Water in reproduction**
PLANT 1	A	C	Spores	Water needed for reproduction
PLANT 2	Xylem and phloem present	True roots, stems and leaves	D	Water needed for reproduction
PLANT 3	Xylem and phloem present	True roots, stem and leaves	E	No water needed for reproduction
PLANT 4	B	True roots, stem and leaves	Stamens and pistils found in flowers; seed enclosed in a fruit	F

(6)
[10]

2.3 The drawing represents a flower of an angiosperm



2.3.1 Give ONE reason why the flower of this plant is classified as an angiosperm. **(1)**

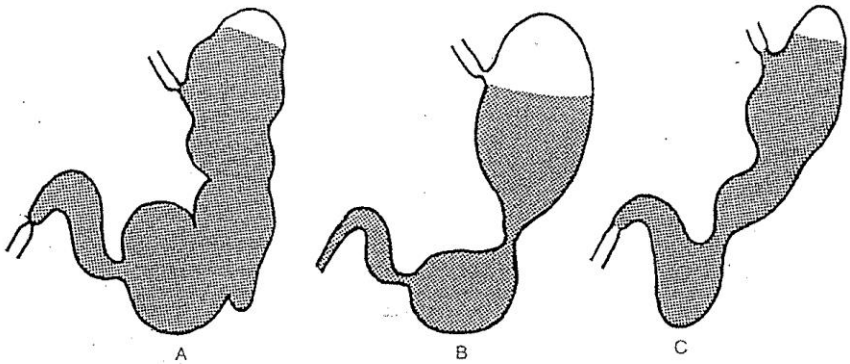
2.3.2 Give the labels for A, E and H **(3)**

2.3.3 Which letter refers to the whorl that is important for insect pollination? **(1)**

2.3.4 a) Is this the flower likely to be self-pollinated or cross-pollinated? **(1)**

b) Give a reason for your answer **(2)**
[8]

2.4 The pictures below show three frames taken at ten second intervals from an X-ray film of a patient who had been given a meal.



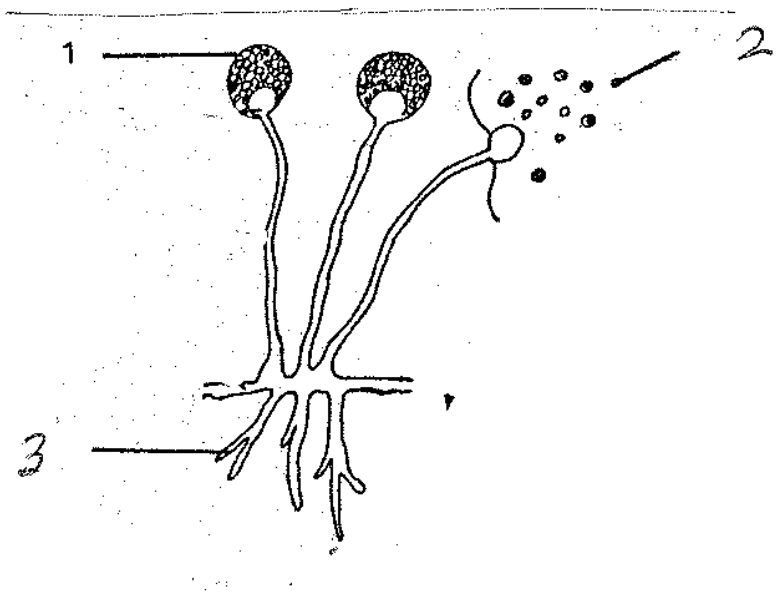
2.4.1 Through which region of the alimentary canal was this picture taken? **(1)**

2.4.2 What term is used to describe the pattern of muscular movement as seen in the series of pictures **(1)**

2.4.3 Give TWO functions which are performed by the movements as mentioned in 2.4.2 above. **(2)**

2.4.4 Name one substance other than food and water, which is normally present in the above organ. **(1)**
[5]

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



2.5.1 Name the group of organisms to which the above organism belongs. **(1)**

2.5.2 Identify the parts numbered 1,2 and 3. **(3)**

2.5.3 Where is structure labelled 3 located? **(1)**

2.5.4 What type of nutrition takes place in this organism? **(1)**

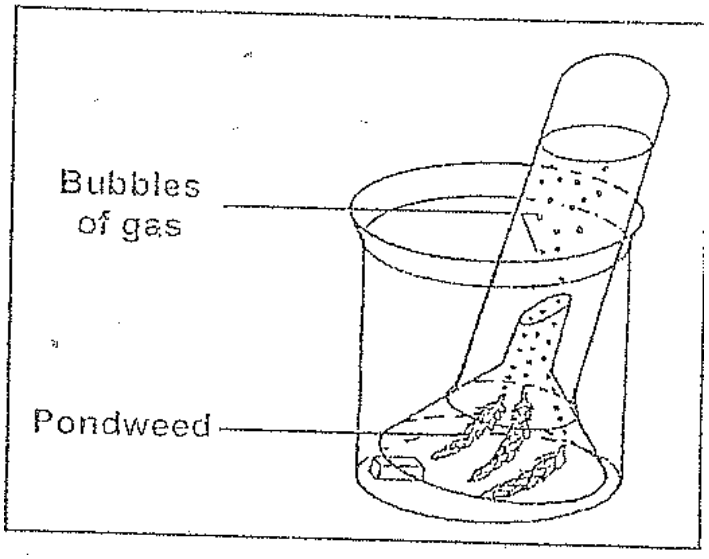
[6]

Total Question two = [40]

<u>Question Three</u>

3.1 When light shines on pondweed, Elodea sp, bubbles of gas are released. The rate at which bubbles of gas are produced can be used to measure the rate of photosynthesis. An investigation was carried out to study the effect of different colours of light on the rate of photosynthesis in the pondweed.

- The pondweed was exposed to one colour of light and left for 5 minutes before measurements were taken.
- The time taken for the release of 20 bubbles was recorded.
- The procedure was repeated using light of a different colour of equal intensity.
- The apparatus was set up as shown in the diagram.



The result are shown in the table below.

COLOUR OF LIGHT	TIME TAKEN TO RELEASE 20 BUBBLES (SECONDS)
Violet	80
Blue	40
Green	160
Yellow	140
Red	70

3.1.1 Which colour is the best for photosynthesis? **(1)**

3.1.2 State the:

a) Independent variable. **(1)**

b) Dependent variable **(1)**

3.1.3 Calculate the average time taken for release of 20 bubbles for all colours.
Show all working. **(2)**

3.1.4 Express bubble production under violet, blue and green light as a ratio. **(1)**

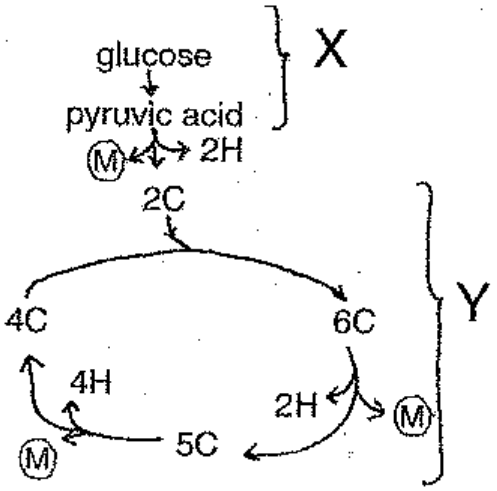
3.1.5 Explain why the apparatus is left for 5 minutes under each colour of light before taking measurements. **(1)**

3.1.6 Without modifying the apparatus, how could the reliability of the results be increased? **(1)**

3.1.7 Using the results, explain how, when white light shines on the plant, the leaves appear to be green. **(2)**

3.1.8 Draw a bar graph of the results shown in the table **(6)**
[16]

3.2 Study the cycle below and answer the questions that follow.



3.2.1 Name the metabolic process shown in this flow diagram. **(1)**

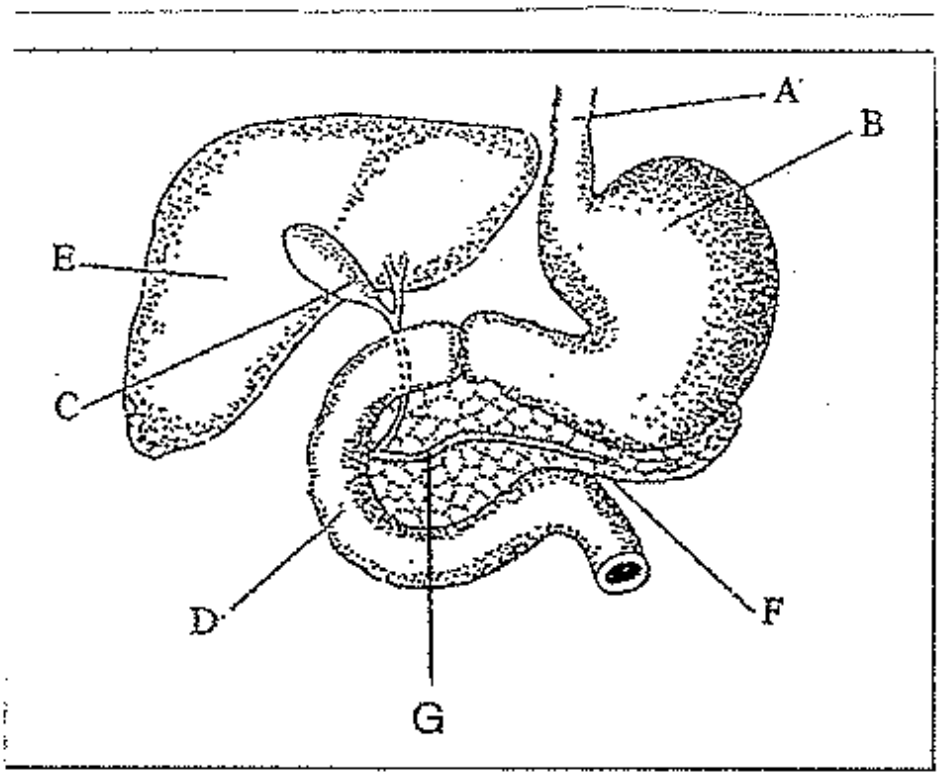
3.2.2 How many carbon atoms are present in:
a) Glucose
b) Pyruvic acid **(2)**

3.2.3 Name two stages indicated at X and Y and state precisely where each takes place in a cell. **(4)**

3.2.4 Name the substance indicated M released at various states in the above diagram. State what happens to this substance. **(2)**

3.2.5 Name the end product formed in mammalian muscle cells during periods of oxygen shortage. **(1)**
[10]

3.3 The following diagram shows part of the human digestive system and associated organs.



3.3.1 Name the parts labelled A, B and C. **(3)**

3.3.2 Name the digestive juice produced by D and state TWO functions of substances in the juice. **(3)**

3.3.3 State two functions of the part labelled E **(2)**

3.3.4 Name the substance stored in C. Why is this substance necessary for digestion of lipids and fats? **(2)**

3.3.5 Explain why organ F is both an exocrine gland and an endocrine gland. **(2)**

3.3.6 Explain how digestion would be affected if structure labelled G is severed **(2)**

[14]

TOTAL QUESTION 3 = [40]

SECTION C
Question 4 (Essay)

Living organisms are directly or indirectly dependent on the radiant energy from the sun for survival.

In an essay discuss how the radiant energy of the sun is converted to glucose during the process of photosynthesis.

NOTE: No marks will be awarded for answers in the form of flow charts and diagrams

Content: 17
Synthesis: 3
TOTAL: 20