Grade 11 | Hillcrest High School | June 2014

Time: 2.5 hours | June Examination | Marks: 150

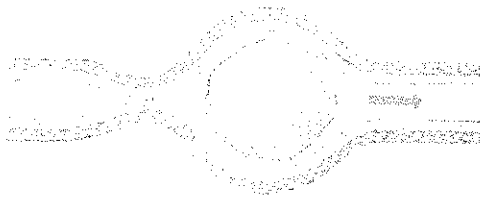
Examiner: Mrs. Gerry | Life Science

Moderator: Mrs Harmse

SECTION A

QUESTION 1.1

1.1.1 Study the diagram below and answer the following question:



The diagram above represents...

A contraction and relaxation of the longitudinal muscles of the digestive tract
B peristalsis
C movement of the bolus through the small intestine
D all of the above

1.1.2 What type of fungi feed on waste or dead organic material?

A Mutualistic
B Saprophytic
C Parasitic
D all of these

1.1.3 Which statement is **incorrect?**

A All viruses are parasites.
B Viruses are absolutely specific with regard to their host.
C Viruses have whip-like flagella.
D Antibiotics are not effective against viruses.

1.1.4 The amoeba is able to move by manipulating its cytoplasm to produce:

A Paramecium
B Phagocytes
C Plasmodium
D Pseudopodia

Use the following information to answer questions 1.1.5 to 1.1.7.

The table represents the number of bacteria, fungi, algae and viruses in a pond at different temperatures. All values represent the number of millions of bacteria, fungi, algae and viruses in a single liter of water.

Temperature °C	Bacteria	Fungi	Algae	Viruses
0	10	2	1	0.1
5	20	3	4	1.2
10	40	4	6	0.6
15	80	5	8	0.5
20	160	6	10	0.8
25	320	7	10	0.1

1.1.5 According to the information provided in the table, the number of which of the following structures is constant after a pond reaches a temperature of about 20 degrees?

A Bacteria
B Fungi
C Algae
D Viruses

1.1.6 If the number of bacteria continued to increase at the same rate as the pond continued to warm, what would the measurement be at 30 degrees?

A 400
B 640
C 860
D 1270

1.1.7 Based on the information presented, the number of which of the following structures is not determined by the pond's temperature?

A Bacteria
B Fungi
C Algae
D Viruses

1.1.8 The processes involved in nutrition, in the correct order are...

A Ingestion, digestion, absorption, assimilation, egestion
B Ingestion, absorption digestion, , assimilation, egestion
C absorption Ingestion, digestion, , assimilation, egestion
D egestion, digestion, absorption, assimilation, ingestion

1.1.9 Athletes foot is caused by:

A Bacteria
B Fungi
C Algae
D Viruses

1.1.10 A flagellum can best be described as:

A Small hair-like structures that protists use to move
B A whip-like structure that protists use to move
C An arm like extension that grabs food
D none of the above

[20]

QUESTION 1.2

Write the correct biological term for each of the following descriptions:

1.2.1 The group of animals with a vertebral column.

1.2.2 The vector of the malaria parasite.

1.2.3 The final phase of the HIV infection.

1.2.4 An infectious disease caused by Myobacterium tuberculosis.

1.2.5 A process through which phygocytes(white blood cells) engulf pathogens.

1.2.6 The removal of undigested food waste.

1.2.7 The type of symmetry of Hydra.

1.2.8 The hard material making up the arthropods exoskeleton.

1.2.9 A blood filled space in arthropods.

1.2.10 The life-style of Porifera. (10)

QUESTION 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.

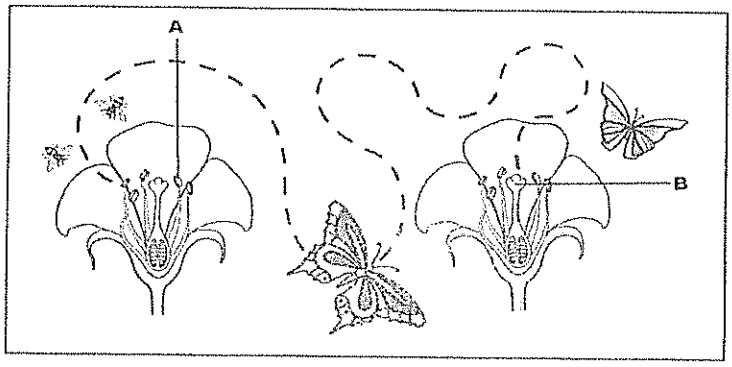
Write **A only, B only, Both A and B** or **none** next to the question number.

Column I	Column II
1.3.1 Plants that have an adventitious root system	A. Monocotyledonous angiosperms B. Gymnosperms
1.3.2 The agent of pollination of angiosperms	A. Wind B. Insects
1.3.3 Teeth that chew and grind food	A. Incisors B. Canines
1.3.4 Disadvantages of sexual reproduction	A. It is a slow process B. Strong, fit offspring produced
1.3.5 Secrete digestive juices	A. Brunner glands B. Crypts of Lieberkuhn
1.3.6 Energy rich carbohydrates are formed.	A. Light dependent phase B. Light independent phase

[12]

QUESTION 1.4

Study the diagrammatical representation of a flowering plant and then answer the following questions.

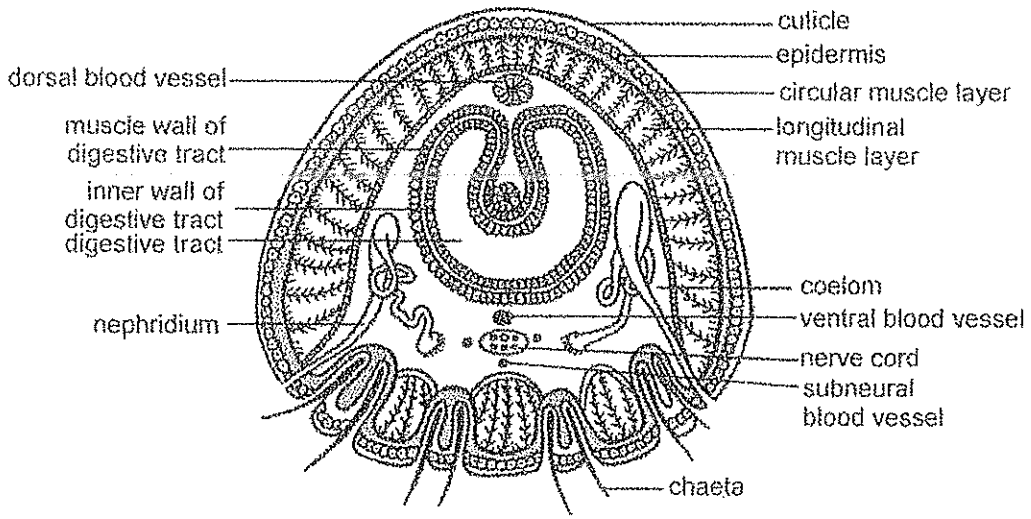


1.4.1 Identify the process represented in the diagram. (1)
1.4.2 Identify the parts of the flower labelled A and B. (2)
1.4.3 Which one of the parts (A or B) is:
1.4.3.1 female (1)
1.4.3.2 male (1)
1.4.4 Name TWO other agents of pollination. (2)
1.4.5 To which plant generation does the mature flower belong. (1) [50]

SECTION B

QUESTION 2.1

Study the cross section through the earthworm below and answer the questions that follow:



A cross-section through an earthworm to show various tissues and organs

2.1.1 Classify the earth worm according to its kingdom and phylum (2)

2.1.2 What type of symmetry does the earthworm have? Provide a reason for your answer. (2)

2.1.3 Why is this type of symmetry mentioned in question 2.1.2, together with cephalization, an ideal body plan for animals, like earthworms, which move with their head first? (2)

2.1.4 Name and briefly explain the type of skeleton that occurs in the earthworm. (2)

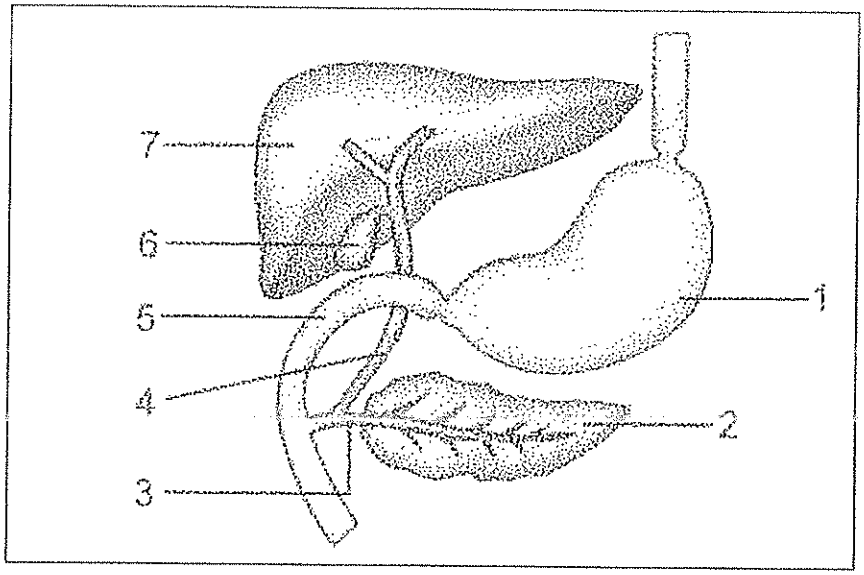
2.1.5 Name TWO aspects, which are visible on the diagram, that make this phylum more advanced than Platyhelminthes. (2)

2.1.6 Name TWO aspects, which are visible on the diagram, that make this phylum less advanced than arthropods. (2)

2.1.7 Draw and label a diagrammatical representation of a coelomate animal, in cross section. (5)

2.1.8 List THREE ways in which invertebrates play an important role in agriculture and ecosystems. (3)

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



2.2.1 Identify the labels numbered 1 to 7. (7)

2.2.2 Name THREE functions of the organ numbered 7. (3)

2.2.3 Explain how part labelled 2 plays a homeostatic role in the body. (4)

2.2.4 What is the role of water in the digestive process? (1)

2.2.5 Name the structures found in the small intestine that absorb digested nutrients. (1)

2.2.6 Draw a labelled diagram of the structure mentioned in question 2.2.5. (4) [40]

QUESTION 3

3.1 Plants require carbon dioxide, water and light to produce sugar during photosynthesis.

Assume a plant requires 4 units of water, 4 units of carbon dioxide and 10 units of light to produce 2 sugar units.

Study the following table of data from 5 plants (1-5) and answer the following questions.

Plant	Units Water	Units CO^2	Units light	Sugar Units
1	16	16	20	4
2	16	12	30	6
3	20	16	20	4
4	20	20	40	8
5	16	40	16	2

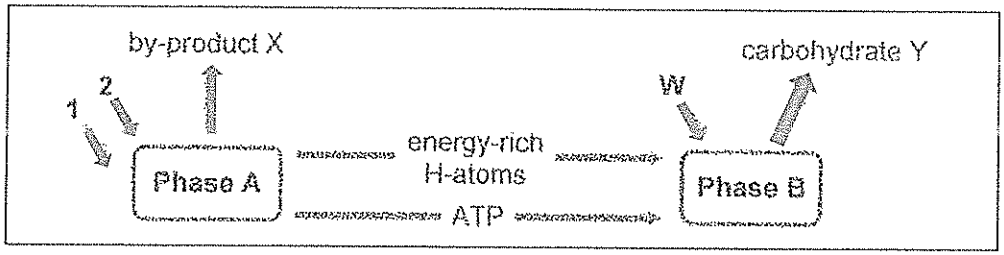
3.1.1 Draw a bar graph to compare the number of sugar units produced by each of the 5 plants. (6)

3.1.2 Which plant produced the most sugar? (1)

3.1.3 If plant 5 received another 14 units of light, how many units of sugar will it be able to produce? Show working. (3)

3.1.4 Which factor prevents plant 1 from producing more sugar? (1)

3.2 The diagram below is a representation of Photosynthesis.



3.2.1 In which organelle does photosynthesis occur? (1)

3.2.2 Identify the phases which are marked A and B respectively. (2)

3.2.3 In which part of the organelle mentioned in question 3.2.1 does A and B take place respectively? (2)

3.2.4 Identify the two raw materials numbered 1 and 2. (2)

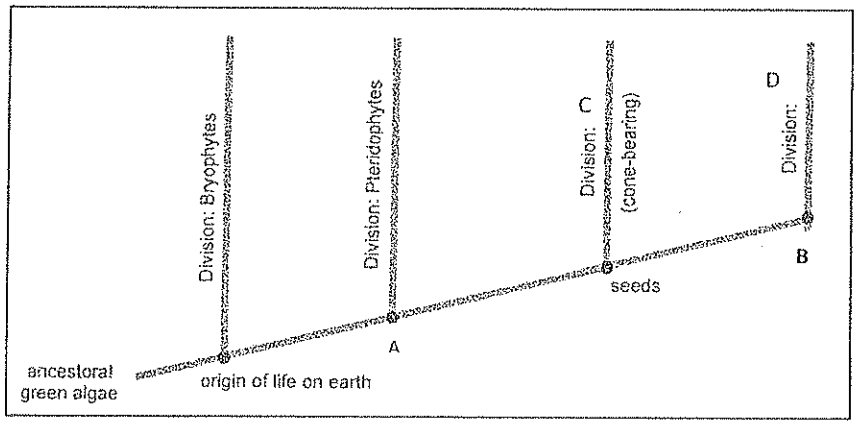
3.2.5 Identify the by-product marked X. (1)

3.2.6 Identify the substance marked W, that is essential for phase B. (1)

3.2.7 Identify the carbohydrate product marked Y. (1)

3.2.8 In what form is product Y stored in plants. (1)

3.3 Study the representation below and answer the questions that follow.



3.3.1 What is this type of representation called? (1)

3.3.2 Explain how this representation is used. (1)

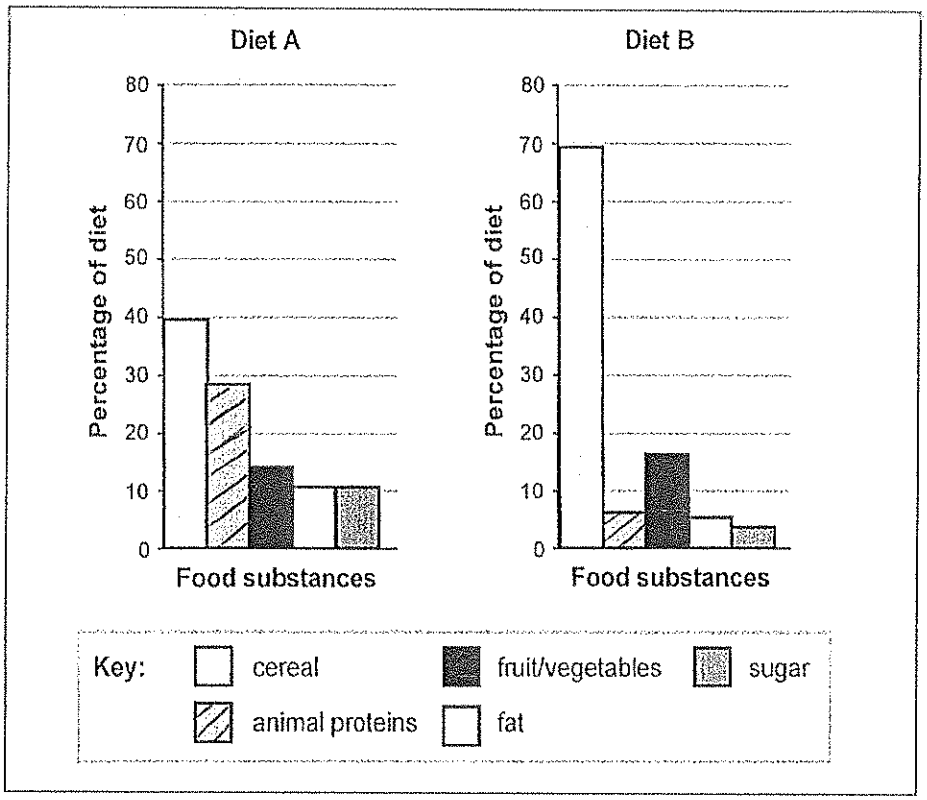
3.3.3 Identify the kingdom into which the ancestral green algae are classified. (1)

3.3.4 Identify the characteristics represented by A and B respectively. (2)

3.3.5 Identify the divisions represented by C and D respectively. (2)

3.3.6 Name a group of plants that belong to the division: Bryophyte. (1)

3.4 The histograms below show the results of an investigation aimed at determining which person A or B has a more balanced diet.



3.4.1 Name two foods from diet B that represent a very similar percentage of the diet. (2)

3.4.2 Provide ONE function of cereal in the diet. (1)

3.4.3 What is the difference between the percentages of cereal in diets A and B? (1)

3.4.4 Which diet provides a source of readily available energy? Give a reason for your answer. (2)

3.4.5 Write a hypothesis for the investigation. (2)

3.4.6 In your opinion, which diet is more suitable for a pregnant women.
Justify your answer. (2)

[40]

SECTION C

Flu, or influenza, is a highly infectious disease caused by viruses. Research has shown that there are different types of flu viruses. When you get flu, your body builds up immunity against a second attack of flu from the same type of virus. However, you are not immune to any other flu viruses. Flu injections which protect one against flu infections, are also not 100% effective, because flu viruses are able to mutate i.e. change their genetic make-up. Therefore the vaccine against flu needs to be adapted continuously.

The flu virus strains usually differ only slightly from one year to the next. Sometimes a new viral strain develops that is different from the previous forms, so that existing vaccines are not effective against it. These viruses usually cause worldwide pandemic.

Adapted from the answer series

Write an essay to discuss the body's immune response to pathogens.

Include in your discussion the difference between natural and acquired immunity. Describe what a vaccine is and how it is intended to help the immune system. Explain the process that occurs once the body has received a vaccination and the advantages and disadvantages of vaccinations.

fact (17)

synthesis: relevance, logical sequence, comprehension (3)

(20)