

HILLCREST HIGH SCHOOL



NATURAL SCIENCE EXAM

GRADE 8

EXAMINER: MRS SMITH

MODERATOR : MRS HARMSE

JUNE 2021

TOTAL: 90 MARKS

TIME : 2 HOURS

INSTRUCTIONS

1. This question paper consists of 11 pages and 2 sections
SECTION A : LIFE SCIENCE (45) SECTION B : PHYSICAL SCIENCE (45)
2. Answer all of the questions from SECTIONS A to B in the ANSWER BOOK provided.
3. Non-programmable calculators may be used.
4. Number the answers correctly according to the numbering system used in this question paper.
6. Give brief motivations, discussions, et cetera where required.
7. Calculations must be rounded off to two decimal places where appropriate.
8. Leave a line between each answer and RULE OFF after each question 1 – 15.

SECTION A

(45)

QUESTION 1

(3)

For each question, Q 1.1 to Q 1.3 there is only one correct answer.

Write down only the letter (A – D) of your choice.

- 1.1 One of the products of photosynthesis is
- A. radiant energy
 - B. oxygen
 - C. water
 - D. carbon dioxide
- 1.2 The bright red and yellow markings/patterns on ladybirds and snakes serves to
- A. attract predators
 - B. help to find a mate
 - C. warn predators that they are poisonous
 - D. camouflage themselves
- 1.3 The main reason why in nature it is highly unlikely that a cheetah will chase a rabbit is because
- A. the rabbit is well camouflaged
 - B. the cheetah cannot digest rabbit flesh
 - C. rabbits run faster than cheetahs
 - D. the total energy profit is too low for the cheetah to give chase.

QUESTION 2

(6)

Write down only one word/term to replace the following statements. .

- 2.1 Different populations living and interacting in the same environment. (1)
- 2.2 Animals that feed on the remains of dead or dying animals. (1)
- 2.3 Plants that are adapted to survive in extremely dry environments. (1)
- 2.4 The type of micro-organism that causes cholera. (1)
- 2.5 The name of the micro-organism used to make bread rise. (1)
- 2.6 The name of the parasitic micro-organism that causes malaria. (1)

QUESTION 3

(4)

SOURCE A

WATER PLANTS → CADDIS FLY LARVAE → KINGFISHER → CROWNED EAGLE

SOURCE B

“ There is enough energy in 16 water plants to keep 8 caddis fly larvae alive for one day.”

“ A single kingfisher can survive for one day on the energy it gets from eating four caddis fly larvae.”

“A crowned eagle need to eat two kingfishers per day to stay alive.”

Use the sources **A** and **B** above to answer the questions that follow.

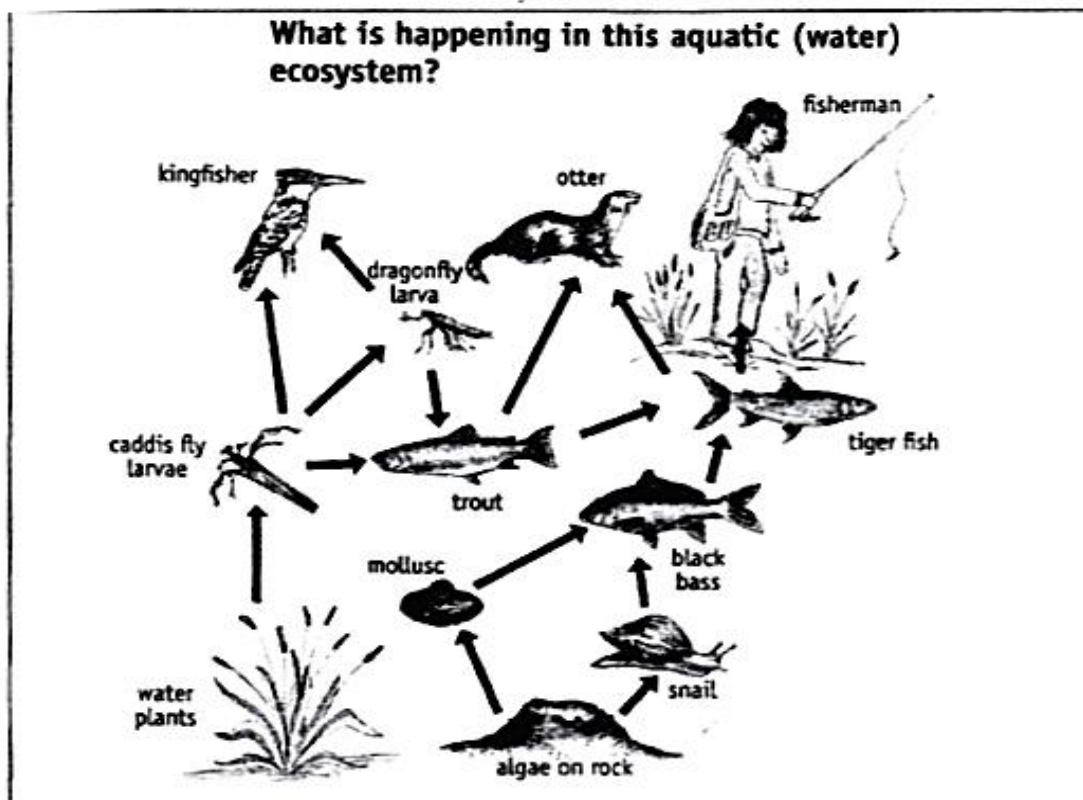
3.1 How many water plants are needed to sustain one kingfisher for one day? (2)

3.2 How many caddis fly larvae are needed to sustain two crowned eagles for one day? (2)

QUESTION 4

(8)

Study the food web carefully and answer the questions that follow.



4.1 Define the term “food web”. (2)

4.2 Complete the following food chain. Supply only the missing word.

water plant → caddis fly larvae → --- (?) ---→ otter (1)

4.3 From **this** food web, identify:

4.3.1 an organism that belongs to the kingdom Protista (1)

4.3.2 any abiotic factor (1)

4.3.3 whether the black bass is a carnivore or an omnivore (1)

4.3.4 any tertiary consumer that is **not** a mammal (1)

4.3.5 any organism that is both a secondary and a tertiary consumer (1)

QUESTION 5 (7)

A scientist conducted a study in the Silvermine Nature Reserve in the Western Cape to determine which species of protea flower (A – D) the male sugar bird (*Cinnyris afer*) is attracted to and prefers to visit the most.

The study was conducted on 7 May 2021 from 8hr00 until 16hr30.



The results of the experiment are as follows:

NO OF VISITS BY THE MALE SUGARBIRD	SPECIES OF PROTEA
3	A
14	B
9	C
5	D

5.1 Suggest a hypothesis for this study. (1)

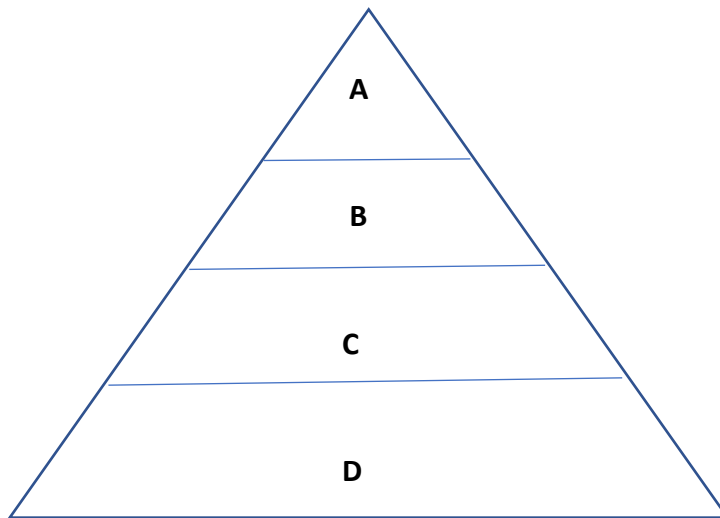
5.2 Identify the dependant variable in the study. (1)

- 5.3 What conclusion can be drawn from this experiment? (1)
- 5.4 Describe two ways in which **you** could improve on this experiment. (2)
- 5.5 Suggest one possible reason why Species A may have been visited the least by the sugarbirds. (1)
- 5.6 Explain/describe one adaptation of the sugar bird that is visible in the picture, and how the sugarbird uses this adaptation for its survival. (2)

QUESTION 6

(12)

The ecological pyramid drawn below represents a certain food chain in nature



- 6.1 Which **letter** represents the producers ? (1)
- 6.2 Identify the organisms indicated by the letter D and state briefly what their functions is in the ecosystem. (2)
- 6.3 Which letter represents trophic level 3? (1)
- 6.4 What type of consumer is represented by C? (1)
- 6.5 Which 2 letters represent carnivores? (2)
- 6.6 If B represents snakes, which letter represents Secretary Birds? (1)
- 6.7 Describe what would happen in a food chain
- 6.7.1 to A , if all the members of B were removed. (2)
- 6.7.2 to C, if all the members of B were removed. (2)

QUESTION 7**(5)**

You have studied micro-organisms and learned of the diseases and illness that they cause.

Write a paragraph of not more than 10 lines in which you discuss

either **TUBERCULOSIS** or **COVID -19** , stating the following facts:

- is the disease caused by a bacterium or a virus
- how is the disease transmitted from person to person
- name two symptoms of the illness
- is there any treatment for the disease once it has been contracted, and if so what are they
- how can the spread of the disease be prevented or reduced

SUB TOTAL (45)

SECTION B**(45)****QUESTION 8****(2)**

For each question, Q 8.1 to Q 8.2 there is only one correct answer.

Write down only the letter (A – D) of your choice.

8.1 Which statement is TRUE?

When a solid changes phase and becomes a liquid.....

- A. the forces of attraction between the particles of the substance increases
- B. the spaces between the particles of the substance decreases
- C. the particles of the substance lose energy to the surroundings
- D. the particles of the substance move faster

8.2 Which of the following is a semi-metal (on the Periodic Table)

- A. silicon
- B. sulfur
- C. sodium
- D. scandium

QUESTION 9**(4)**

Write down only one word/term to replace the following statements.

- 9.1 a molecule consisting of two atoms (1)
- 9.2 a combination of two or more different elements in a fixed ratio (1)
- 9.3 force created by gas particles hitting the inside of a balloon (1)
- 9.4 the movement of particles from an area of high concentration to an area of low concentration (1)

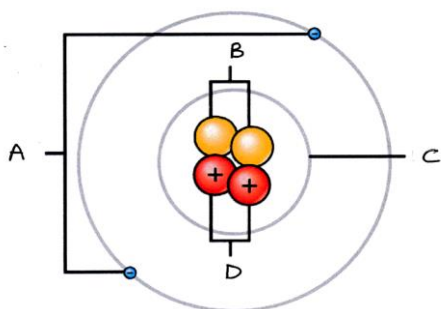
QUESTION 10**(8)**

- 10.1 Write down the chemical symbol for the following element
- 10.1.1 carbon (1)
- 10.1.2 potassium (1)
- 10.2 Write down the name of the following elements
- 10.2.1 F (1)
- 10.2.2 Ca (1)
- 10.3 Write down the formula for the following compounds
- 10.3.1 carbon dioxide (1)
- 10.3.2 table salt (1)
- 10.4 Write down the
- 10.4.1 symbol of the element with an Atomic Number of 24 (1)
- 10.4.2 name of the element in group 17, period 3. (1)

QUESTION 11

(5)

Consider the following diagram of an atom



- 11.1 Provide names for the parts labelled A to C. (3)
- 11.2 What charge does a proton carry? (1)
- 11.3 What is the Relative Atomic Mass of this element? (1)

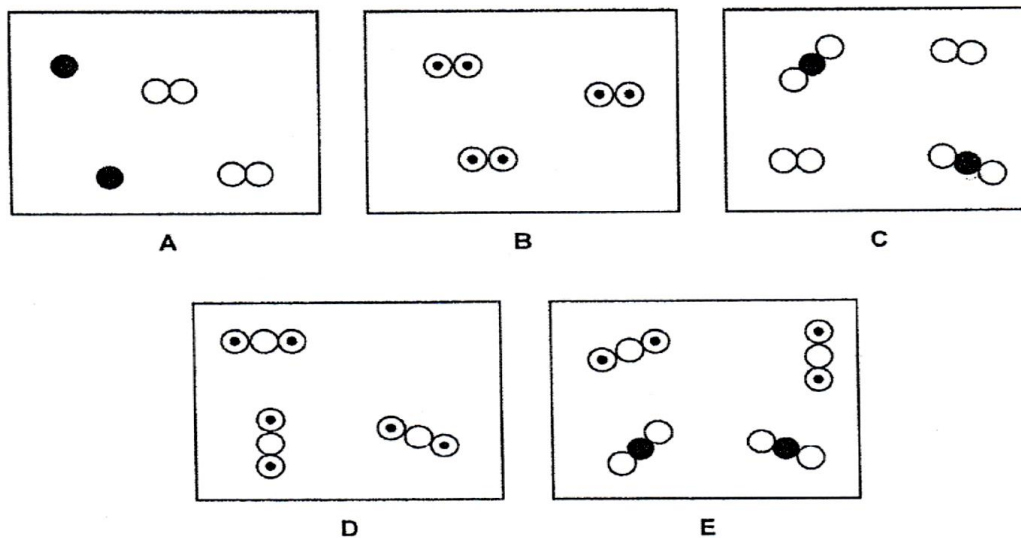
QUESTION 12

(4)

Study the diagrams A – E below and then answer the questions that follow.



The diagrams below show different combinations of these atoms.



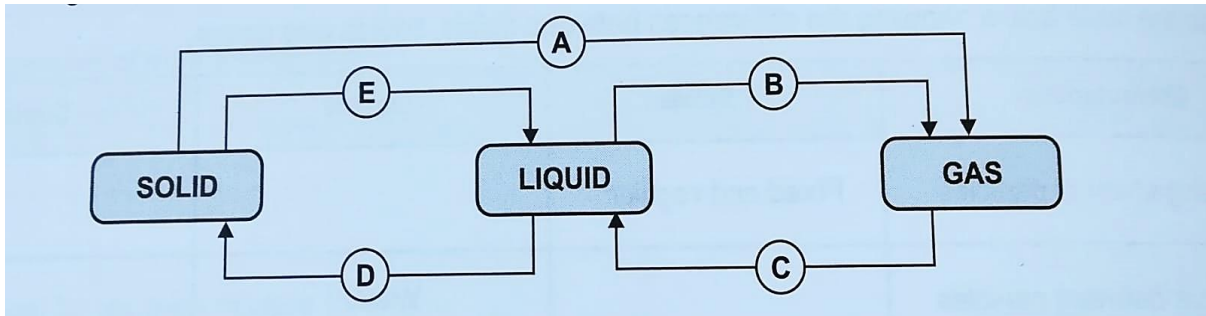
12. Write down **only** the letter/s (A to E) of the diagram or diagrams which show:

- 12.1 only one type of pure substance (2)
- 12.2 a mixture of both an element and a compound (1)
- 12.3 a mixture of two compounds (1)

QUESTION 13

(6)

Consider the diagram showing phase changes in the Particle Model of Matter.

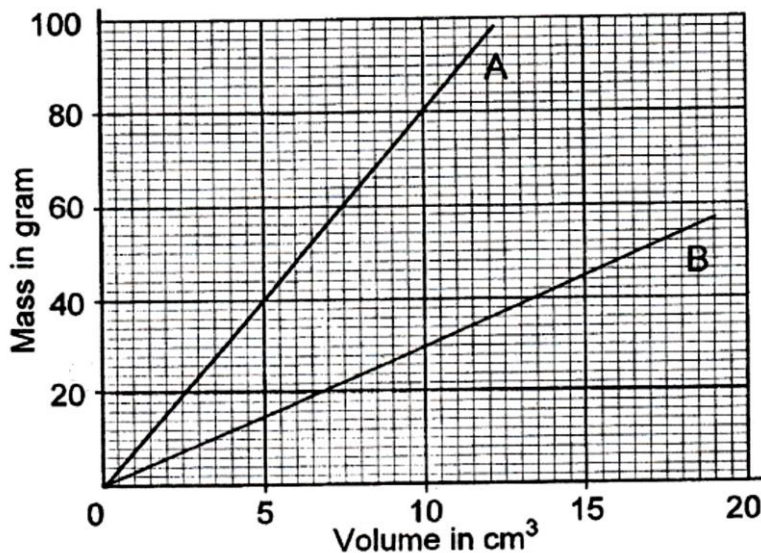


- 13.1 Name the process taking place at C. (1)
- 13.2 Say whether energy is **absorbed from** or **released to** the surroundings during the process labelled B. (1)
- 13.3 Which letter (A -F) shows the process of sublimation? (1)
- 13.4 Describe a solid in terms of the Particle Model. (3)
(Mention the forces and spaces between the particles as well as how they move.)

QUESTION 14

(4)

The graph below indicates the relationship between the MASS and the VOLUME of two different metals, A and B.



- 14.1 From the graph, read off and record
- 14.1.1 the mass of 10 cm³ of substance A (1)
- 14.1.2 the volume of 40g of substance B (1)

- 14.2 State which substance, A or B has the higher density and explain how you reached your conclusion just by looking at the graph? (2)

QUESTION 15 (12)

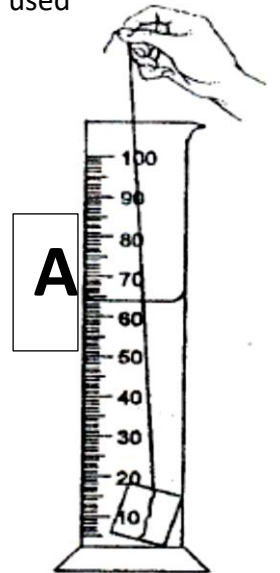
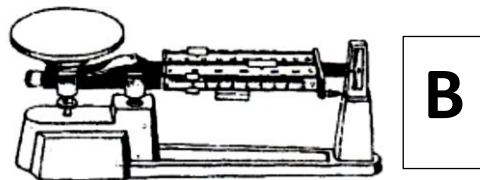
15.1 To conduct density experiments on objects, the following apparatus may be used during the investigation.

15.1.1 Identify the apparatus labelled A alongside. (1)

15.1.2 What does this apparatus record about the object being investigation? (1)

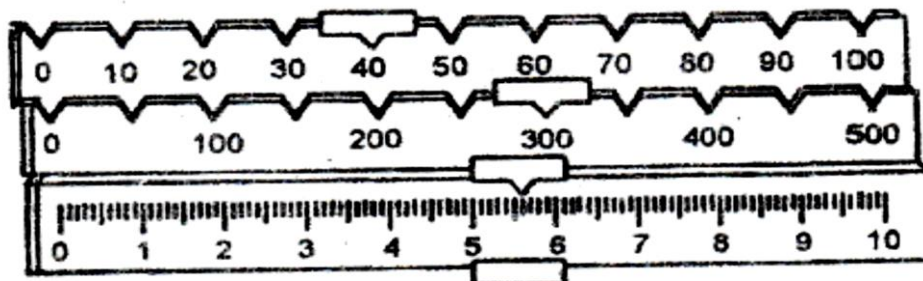
15.1.4 What is the approximate reading on the apparatus labelled A? (1)

15.1.3 Identify the apparatus below labelled B. (1)



15.1.4 What does this apparatus record about the object being investigated? (1)

15.1.5 What is the reading on the apparatus labelled B below? (1)



15.2 Using the formula $D = \frac{M}{V}$, calculate the following. (Round off all your answers to 2 decimal places.)

15.2.1 Calculate the density of a wooden block that has a mass of 0,92g and a volume of 0.55 cm³. (3)

15.2.2 Will the wooden block **sink** or **float** when placed in water? Provide a reason for your answer. (3)

SUB TOTAL (45)

TOTAL (90)

