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Support Pack | Grade 12

CAPS

Life Sciences

Practice Examination: Paper 1

This support pack consists of a **Practice examination paper** for Paper 1 of the **Life Sciences Grade 12 CAPS curriculum** and provides valuable practice in writing the examinations. An answer memo is provided separately for you to check learners' answers. Learners can work through these individually at home or these could form the basis of a catch-up class or online lesson. You have permission to print or photocopy this document or distribute it electronically via email or WhatsApp.

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PAPER 1

MARKS: 150

TIME: 2½ hours

INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

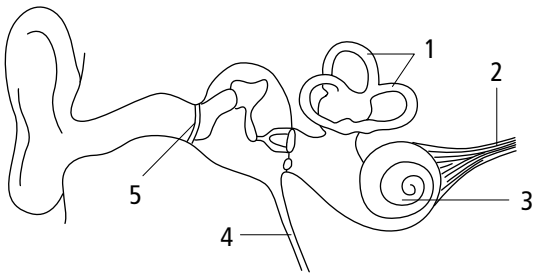
1. Answer ALL the questions.
2. Write ALL the answers in the ANSWER BOOK.
3. Start the answers to each question at the top of a NEW page.
4. Number the answers correctly according to the numbering system used in this question paper.
5. Present your answers according to the instructions of each question.
6. ALL drawings should be done in pencil and labelled in blue or black ink.
7. Draw diagrams or flow charts only when asked to do so.
8. The diagrams in this question paper are NOT necessarily drawn to scale.
9. Do NOT use graph paper.
10. You must use a non-programmable calculator, protractor and a compass, where necessary.
11. Write neatly and legibly.

SECTION A

QUESTION 1

1.1 Various options are provided as possible answers to the following questions. Choose the correct answer and write only the letter (**A** to **D**) next to the question number (**1.1.1** to **1.1.9**) in the ANSWER BOOK, for example 1.1.10 D.

QUESTIONS 1.1.1 AND 1.1.2 REFER TO THE DIAGRAM BELOW SHOWING THE STRUCTURE OF THE HUMAN EAR.



1.1.1 Which part is responsible for balance?

A 3
B 1
C 4
D 5

1.1.2 Which part contains the organ of Corti?

A 4
B 3
C 2
D 1

1.1.3 Which of the following pairs indicate a reproductive structure and its function correctly?

A Fallopian tube – production of sperm
B Uterus – development of embryo
C Vagina – fertilisation
D Testes – production of ovum

1.1.4 The following are effects of the secretion of different hormones.

i An increase in the blood glucose level
ii An increase in the heart rate
iii An increase in the amount of digestive enzymes
iv An increase in blood flow to the skeletal muscles

Which one of the following combinations of the above effects is due to adrenalin?

A i, iii and iv
B ii, iii and iv
C i, ii and iv
D i, ii, iii and iv

1.1.5 Which of the following is a function of the medulla oblongata?

A Balance and muscle co-ordination
B Control of movements of body parts
C Control of heartbeat and breathing
D Sensation of hearing

1.1.6 In the development of the mammalian embryo, the purpose of the amnion is to:

A Serve as a reserve food supply
B Give rise to the placenta
C Prevent the developing foetus from moving about
D Enclose a fluid that protects the embryo against injury

1.1.7 The mammalian embryo develops before birth in the:

A Vagina
B Ovary
C Uterus
D Ureter

1.1.8 Which of the following, concerning human chromosomes, is wrong?

A Zygote – 2n
B Embryo – 2n
C Gonads – n
D Gametes – n

1.1.9 The list below gives some of the stages involved in gamete and zygote formation.

i Prophase I
ii Prophase II
iii Metaphase I
iv Fertilisation

Which one of the following combinations of the above stages contributes to genetic variation?

A i, ii and iii
B i, iii and iv
C ii and iii
D iii and iv

(9 × 2) **[18]**

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 **1.2.9**) in the ANSWER BOOK.

1.2.1 The period of development of an embryo in the uterus between fertilisation and birth

1.2.2 Disease characterised by a lack of insulin production

1.2.3 Tube that connects the throat and the middle ear

1.2.4 A process by which nutrients become highly concentrated in a body of water, leading to increased growth of organisms such as algae

1.2.5 The type of development in birds where the young are incapable of moving around after hatching

1.2.6 The fibrous outgrowths of a neuron that transmits nerve impulses to the cell body of the same neuron

1.2.7 A phenomenon where an increase in one hormone inhibits the secretion of another hormone

1.2.8 Iodine is necessary in the production of thyroxine. A shortage may lead to this condition

1.2.9 The hormone that prepares the body for an emergency

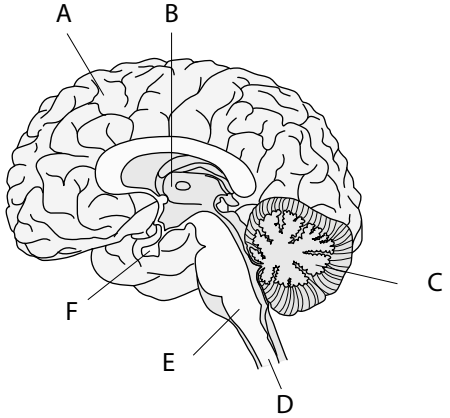
[9]

1.3 Indicate whether each of the statement 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 (**1.3.1** to **1.3.6**) in the ANSWER BOOK.

Column I		Column II	
1.3.1	Tube/s leading from the testes to the urethra	**A** **B**	Ureter Vas deferens
1.3.2	Converts glycogen to glucose	**A** **B**	Glucagon Adrenalin
1.3.3	Method of reproduction in which the foetus is nourished through an umbilical cord	**A** **B**	Ovipary Vivipary
1.3.4	Hormone secreted by the pituitary gland/ hypophysis	**A** **B**	Aldosterone FSH
1.3.5	Hormone that remains at a high level during pregnancy	**A** **B**	Progesterone FSH
1.3.6	Examples of greenhouse gases	**A** **B**	Carbon dioxide Methane

(6 × 2) **[12]**

1.4 Study the diagram representing the structure of the human brain below.



1.4.1 Identify the part labelled C. (1)

1.4.2 Give the LETTER ONLY of the part which: (2)

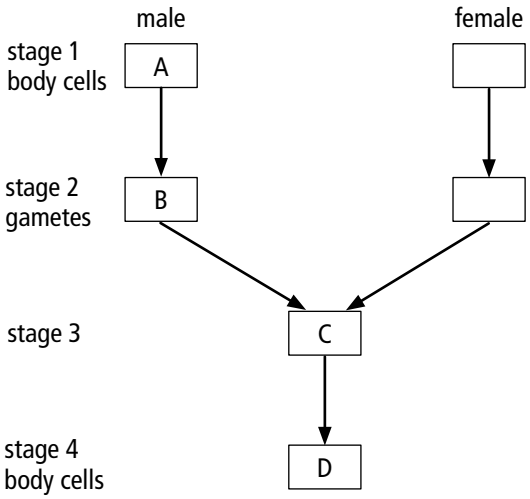
a) Regulates heartbeat and breathing rate

b) Co-ordinates movement while walking

1.4.3 Explain how the body would be affected if the part labelled F did not secrete TSH. (2)

[5]

1.5 The diagram below shows the various stages in the life cycle of a human.



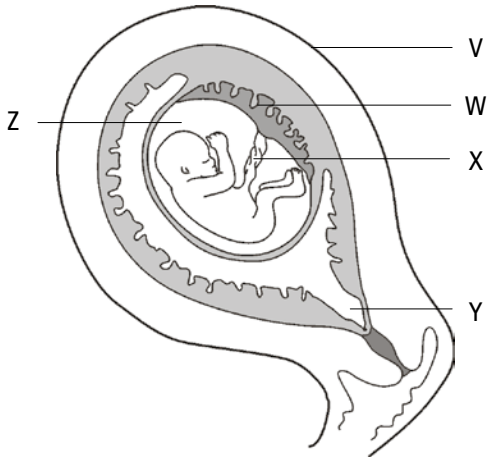
1.5.1 State the chromosome number of the cells represented by A, B and C. (3)
1.5.2 Name the structure at Stage 3. (1)
1.5.3 Between which two consecutive stages does meiosis occur in the life cycle? (1)
1.5.4 Between which two consecutive stages does mitosis occur in the life cycle? (1)
[6]

TOTAL SECTION A: [50]

SECTION B

QUESTION 2

2.1 The diagram below represents a developing foetus in a human body.



2.1.1 Identify the parts labelled:
a) W
b) X
c) Y (3)
2.1.2 State ONE function of the fluid labelled Z. (2)
2.1.3 Explain how the part labelled V is structurally suited to perform its function during the process of birth. (2)

2.1.4 Name TWO systems in the baby's body that take over the functions of part W once the baby is born. (2)

2.1.5 Explain what prevents another ovum from being produced while the foetus is developing in a human body. (2)

[11]

2.2 In an investigation a learner was asked to put a cotton thread through the eye of a needle 10 times with both eyes open and then with only the right eye open. This exercise was done under the same light intensity and at a distance of 50 cm from the eyes.
The results are recorded in the table below.

Time taken to thread the needle in seconds (s)		
Attempts	Two eyes open	Only right eye open
1	12	38
2	12	35
3	10	37
4	11	36
5	9	34
6	9	33
7	10	30
8	8	31
9	7	29
10	7	28

2.2.1 Apart from the factors mentioned, name ONE other factor that had to be kept constant during the investigation. (1)

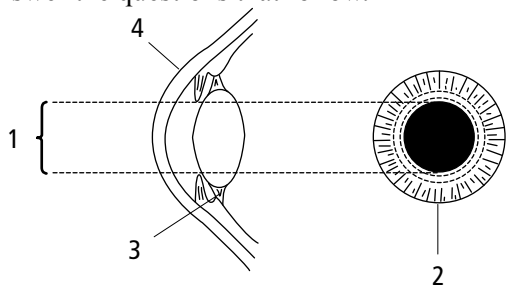
2.2.2 State a general conclusion that can be drawn for the results above. (2)

2.2.3 Give a reason why more than one attempt was made in this investigation. (1)

2.2.4 Describe the changes that would take place in the eye if the distance between the needle and the eye were reduced from 50 cm to 20 cm. (4)

[8]

2.3 Study the diagram that illustrates the anterior view and longitudinal section of the human eye and answer the questions that follow.



2.3.1 Identify the parts numbered 2 and 3. (2)

2.3.2 Give ONE function of the part numbered 4. (1)

2.3.3 Name the conditions responsible for: (2)

a) the size of the pupil in the diagram

b) the shape of the lens in the diagram.

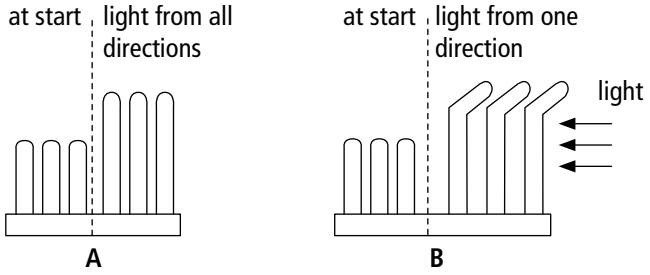
2.3.4 Briefly describe the mechanism involved in achieving the rounded shape of the lens shown in the diagram. (4)

[9]

2.4 A group of Grade 12 learners wanted to investigate the effect of light coming from one direction on the growth of shoots. They planted some wheat seeds in two seed trays and allowed them to germinate. When young shoots appeared above the soil level, the shoots were exposed to light from all directions for three days. After three days, the trays received different treatments as follows:

- Tray A: the shoots were exposed to light from all directions
- Tray B: the shoots were exposed to light from one direction only.

The diagrams below show the effects of these treatments. Study them and answer the questions that follow.

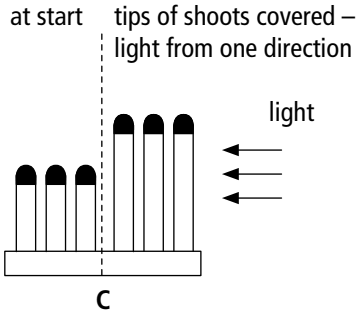


2.4.1 Formulate a hypothesis for the investigation. (3)

2.4.2 Explain why it was important to include tray A as part of this investigation. (3)

2.4.3 State ONE conclusion that may be drawn from this investigation. (2)

A third tray was set up in a similar way as tray A and B. The tips of the shoots were covered with aluminium foil. The diagram below shows the appearance of the shoots at the start and after being exposed to light from one direction only.



2.4.4 What conclusion can you draw from the results obtained in tray C? (2)

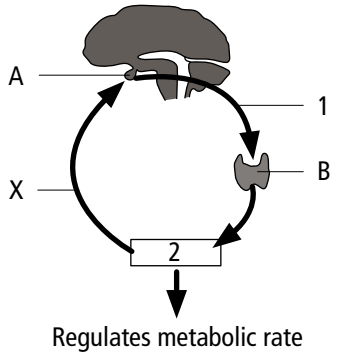
2.4.5 Name TWO uses in agriculture of gibberellins. (2)

[12]

TOTAL QUESTION 2: [40]

QUESTION 3

3.1 The diagram below illustrates the interaction between the two endocrine glands and their secretions.



3.1.1 What interaction is depicted by this diagram? (1)

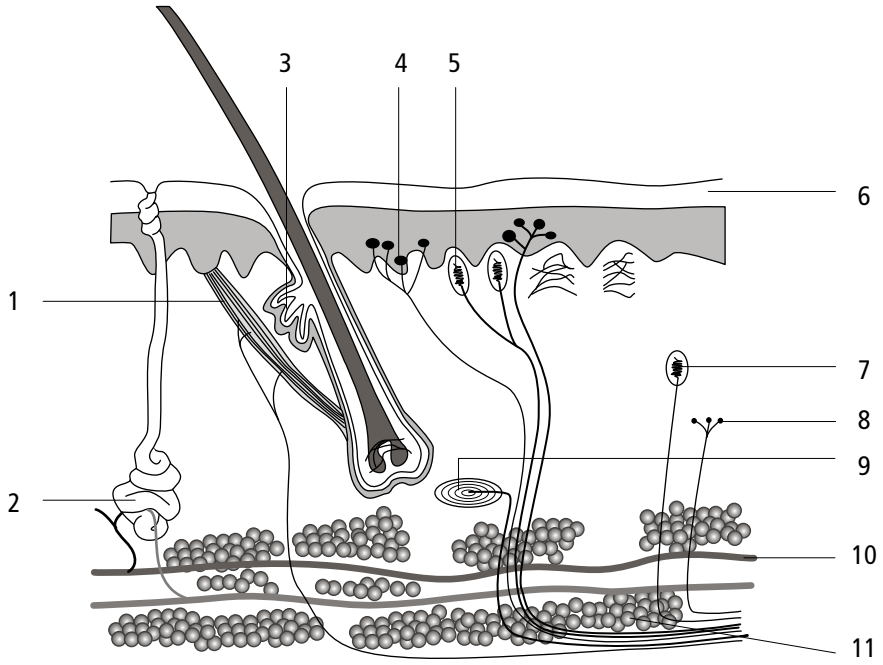
3.1.2 Identify the hormone 1. (1)

3.1.3 The hormone numbered 2 performs several functions in the body. Suggest its function indicated by the letter X. (1)

3.1.4 Describe briefly the interaction between the two glands mentioned in question 3.1.3. (6)

[9]

3.2 Study the diagram below representing the human skin and answer the questions that follow.



3.2.1 With which three processes is structure 2 associated? (3)

3.2.2 Describe the role of parts 2 and 10 in regulating blood temperature in a human on a hot day. (6)

[9]

3.3 The Human Sciences Research Council (HSRC) conducted a survey on food security across the provinces. The results 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
North West	30

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. (5)

3.3.3 State how the use of fertilisers by farmers can:

a) increase food security for a country (2)

b) decrease food security for a country. (2)

3.3.4 Explain how the use of pesticides by farmers can:

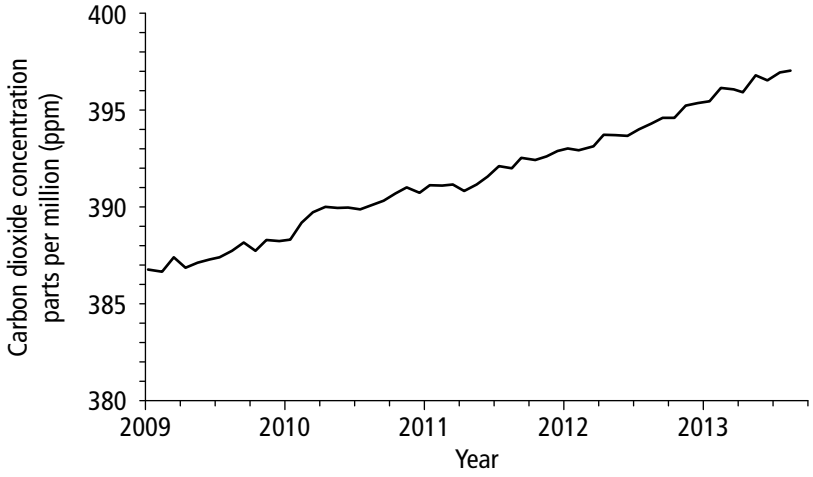
a) increase food security for a country (1)

b) decrease food security for a country. (1)

3.3.5 State THREE factors, other than the use of fertilisers and pesticides, which may have led to a decrease in the percentage of food secure households in South Africa since 2008. (2)

[15]

3.4 The graph below shows the averages of carbon dioxide concentration in the atmosphere since January 2009, as measured at the Mauna Loa Observatory in Hawaii.



Adapted from http://www.esrl.noaa.gov September 2013

3.4.1 What was the carbon dioxide concentration in the atmosphere in July 2012? (1)

3.4.2 What is the dependent variable in this investigation? (1)

3.4.3 Mention one human activity, other than deforestation, that might have led to the increase in carbon dioxide concentration as seen on the graph (1)

3.4.4 Describe how deforestation could lead to an increase in carbon dioxide levels in the atmosphere. (2)

3.4.5 State one way in which humans can reduce the amount of carbon dioxide released into the atmosphere. (2)

[7]

TOTAL QUESTION 3: [40]

TOTAL SECTION B: [80]

SECTION C

QUESTION 4

The nervous system helps to protect the human body.

Use a suitable example to describe how this is achieved through a reflex action.

Content: (17)

Synthesis: (3)

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

TOTAL SECTION C: [20]

GRAND TOTAL: [150]