

.....

**Life Sciences
Grade 12
Practice Test**

Date: August 2020

Duration: 1Hour

Total Marks: 70

Examiner:

Moderator:

Number of Pages: 11

INSTRUCTIONS AND INFORMATION:

Read the following instructions carefully before answering the questions.

1. Answer ALL the questions in the ANSWER BOOK provided.
2. Start the answer to EACH section at the top of a NEW page.
3. Number the answers correctly according to the numbering system used in this question paper.
4. Present your answers according to the instructions of each question.
5. If answers are not presented according to the instructions of each question, candidates will lose marks.
6. ALL drawings should be done in pencil and labelled in blue or black ink.
7. Draw diagrams or flow charts only when requested to do so.
8. The diagrams in this question paper may NOT necessarily be drawn to scale.
9. The use of graph paper is NOT permitted.
10. Non-programmable calculators, protractors and compasses may be used.
11. Write neatly and legibly. Candidates will lose marks for slovenly and illegible work.

SECTION A**QUESTION 1**

1.1 Various options are provided as possible answers to the following questions. Choose the most correct answer and write only the letter (A – D) next to the question number (1.1.1 – 1.1.5) in the ANSWER BOOK, for example 1.1.7 D.

1.1.1 Which ONE of the following refers to a part of the nervous system that is involved in the regulation of body temperature?

- A Corpus callosum
- B Cerebellum
- C Hypothalamus
- D Spinal Cord

1.1.2 Given below is a list of functions performed by different organs in an organism.

- (i) Excretion
- (ii) Gaseous exchange
- (iii) Nutrition
- (iv) Protection

Which of the following combinations of the above functions are fulfilled by the amniotic egg?

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

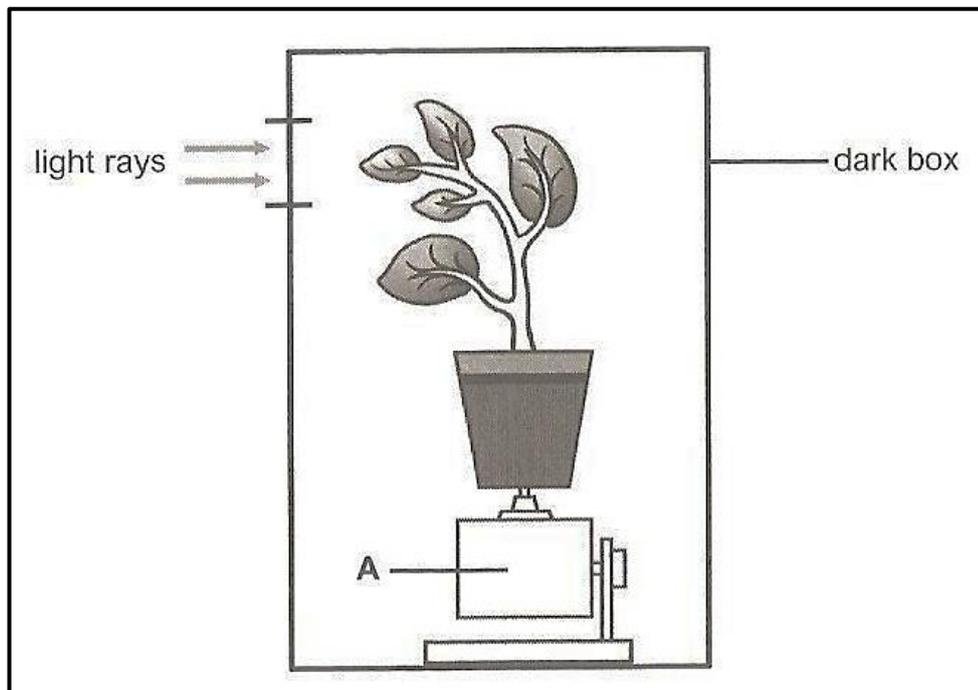
1.1.3 An investigation was done to determine the effect of alcohol on the reaction time of a person. Reaction time was measured by the time it took to catch a ruler. The procedure was as follows:

- The person's reaction time was first measured in a room with bright light.
- The person was then given 200 ml of alcohol to drink.
- After 15 minutes the reaction time of the person was measured for the second time, while he/she was in a room with dim light.
- Ten measurements were recorded each time and an average was calculated.

How was the validity of the investigation **decreased**?

- A The reaction time was measure by the time it took to catch a ruler.
- B The person's reaction time was measured in the absence of alcohol the first time.
- C Reaction time was measured the second time under different light conditions.
- D Only ten measurements were recorded.

1.1.4 The diagram below shows an investigation in which a pot plant is subjected to unilateral light.



Which of the following is true about the investigation?

- A Apparatus A is stationary i.e. the plant is not being rotated.
- B Geotropism is being investigated.
- C Apparatus A is turning, therefore rotating the plant.
- D The plant shoot is showing negative phototropism.

(4 × 2)

(8)

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

1.2.1 Growth response of a plant to an external stimulus.

1.2.2 A delicate mucous membrane that covers the front of the eye and lines the eyelids.

1.2.3 A chemical substance that transmits impulses between two neurons.

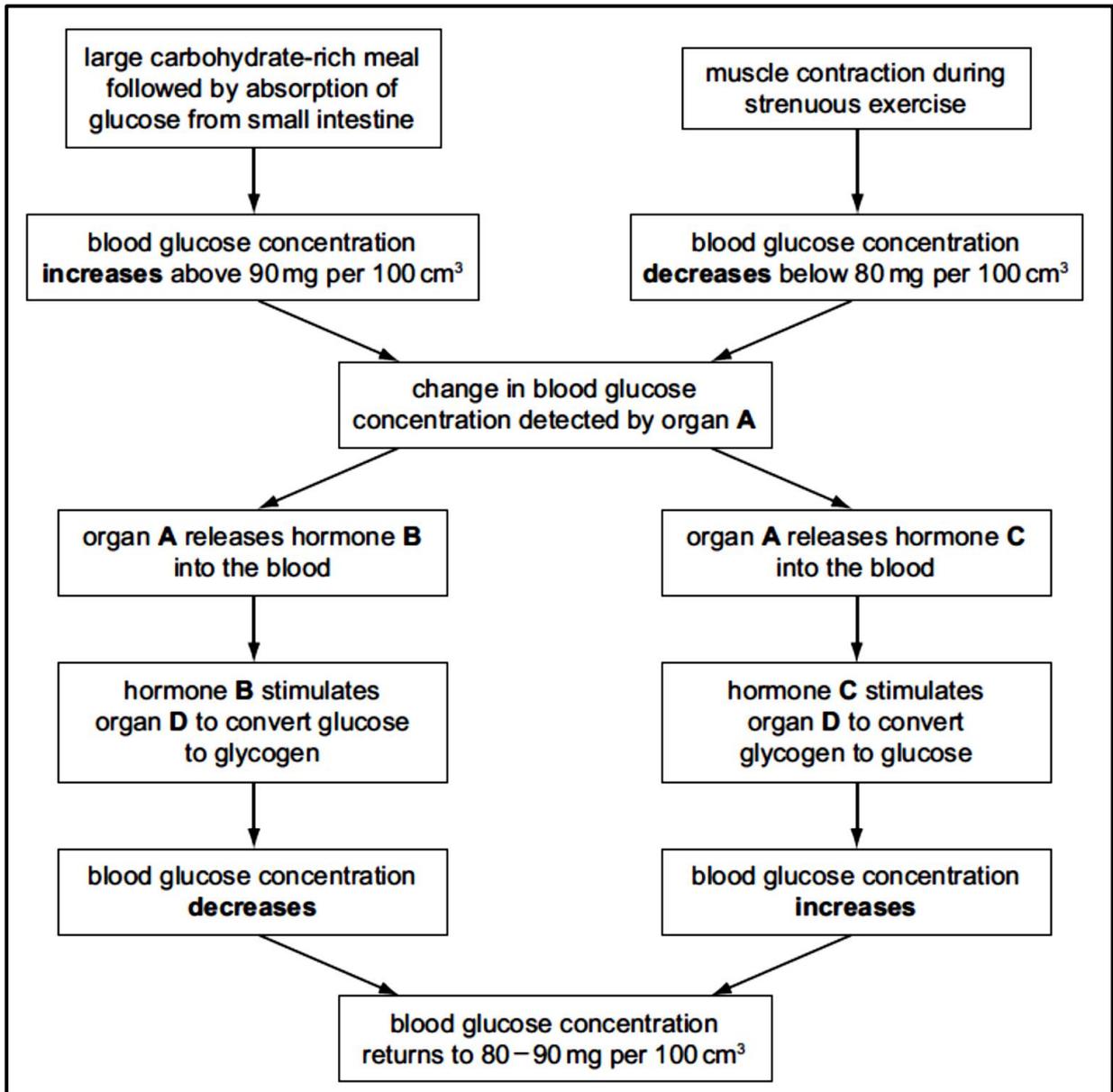
(3 × 1) (3)

TOTAL SECTION A:11

SECTION B

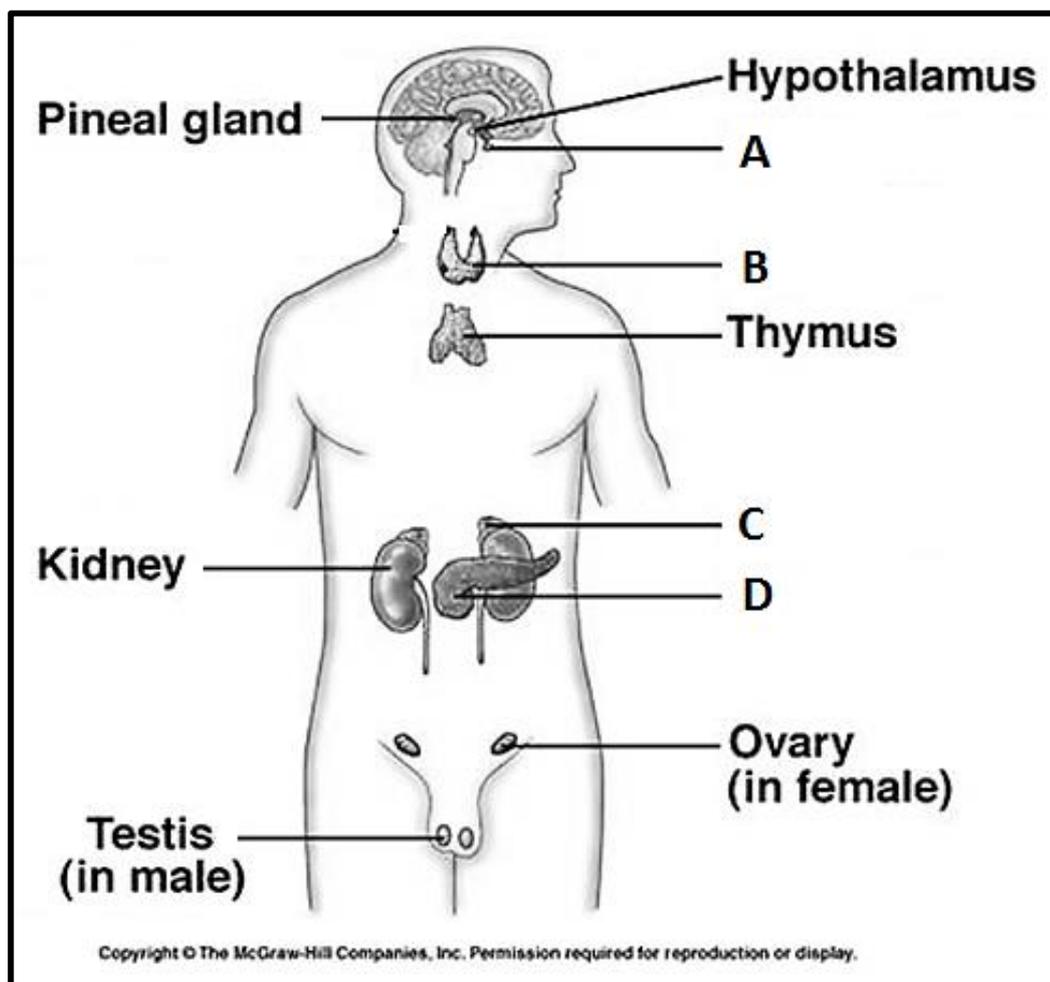
QUESTION 2

- 2.1 The glucose concentration of the blood is maintained within the range 80 – 90 mg per 100 cm³ blood. The figure below is a flow chart showing how the body responds to changes in the glucose concentration of the blood after the absorption of a carbohydrate-rich meal and during strenuous exercise.



- 2.1.1 Name the type of control system that returns the blood glucose concentration to 80 – 90 mg per 100 cm³ blood. (1)
- 2.1.2 Name organs **A** and **D**. (2)
- 2.1.3 Identify hormones **B** and **C**. (2)

- 2.1.4 (a) Name the disorder in which a person's body does not respond to hormone **B** even though it is produced in sufficient quantities. (1)
- (b) Suggest how the disorder named in QUESTION 2.4.4 (a) can be managed. (1)
- 2.1.5 Why does the blood glucose concentration decrease during strenuous exercise? (2)
- 2.1.6 Suggest why glucose is converted to glycogen rather than kept as glucose inside the cells. (2)
- [11]
- 2.2 Study the diagram below and answer the questions that follow.



A hormone secreted by one of the glands labelled A to D has the following effects:

- Heartbeat increases
- Vasoconstriction of blood vessels to the gut
- Dilation of pupils

2.2.1 Give the **letter and name** of the gland that secretes the hormone which brings about the changes listed above. (2)

2.2.2 Explain the significance of each of the following changes:

(a) Heartbeat increases (2)

(b) Pupils dilate (2)

2.2.3 Explain the relationship between gland A and the kidney on a hot day. (6)
[12]

QUESTION 3

3.1 A botanist wanted to investigate the effect that 2 plant hormones (A and B) had on the germination of seeds,
He used the following procedure

- He allowed lettuce seeds to germinate
- He then measured the concentration (in nano grams per gram) of each of the two hormones, A and B, in the seeds over a period of 40 days
- His results are show in the table below.

Time (in days)	Concentration of Hormone a (in ng/g)	Concentration of Hormone b (in ng/g)	Percentage germination of seeds
0	350	5	0
10	70	20	10
20	50	45	65
30	20	70	80
40	10	55	95

- 3.1.1 Describe the relationship between the levels of hormone A and the percentage germination of seeds. (2)
- 3.1.2 (a) Use your answer in question 3.1.1 to show which hormone is represented by A (1)
- (b) Explain your answer in question 3.1.2 (a) (2)
- 3.1.3 Plot a graph to show the effect that hormone b has on the germination of seeds. (6)
- [11]**

- 3.2 An investigation was carried out to determine the influence of alcohol on the volume of urine produced.

12 healthy, 23 year-old males of similar height and mass participated in the investigation

The investigation was conducted as follows

- The men were divided into two groups of six each, group A and group B
- The two groups ate the same food and did the same exercise for the 24 hour period before testing
- Each group was given the following to drink after 24 hour period
 - Group A : 1 litre of alcohol free beer
 - Group b : 1 litre of alcoholic beer
- Urine was collected from each man every hour

Assume that the volume of urine collected is equal to the volume of urine produced
The results of the investigation are shown in the table below

Time of collection	Average volume of urine collected (mL)	
	Group a	Group b
After 1 hour	599	643
After 2 hours	413	504
After 3 hours	112	132

- 3.2.1 State:
- (a) The dependant variable in this investigation (1)
- (b) Two planning steps the investigators had to take before the investigation could start . (2)
- (c) Two factors that need to remain constant, other than the ones mentioned. (2)
- (d) Two steps that the investigators took to ensure the reliability of the investigation. (2)
- 3.2.2 Based on the results; explain how the intake of alcohol influences the secretion of ADH and consequently the volume of urine that is produced by both kidneys. (4)
- [11]

TOTAL SECTION B:45

SECTION C**QUESTION 4**

- 4.1 Violet and Vusi were walking through a garden barefooted and Violet stepped on a thorn.

Explain the process of how Violet pulled her foot away.

Content:11

Synthesis: 3

TOTAL SECTION C: 14

GRAND TOTAL: 70

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