

education

Department of Education
REPUBLIC OF SOUTH AFRICA

SENIOR CERTIFICATE EXAMINATION - 2006

BIOLOGY PAPER 2

STANDARD GRADE

OCTOBER/NOVEMBER 2006

306-2/2E

BIOLOGY SG: Paper 2



306 2 2E

SG

MARKS: 150

TIME: 2 hours

This question paper consists of 17 pages.



INSTRUCTIONS AND INFORMATION

Read the following carefully before answering the questions:

1. Answer ALL the questions.
2. Write ALL the answers in the ANSWER BOOK.
3. Start the answer to each question at the top of a NEW page.
4. Number the answers exactly as the questions are numbered.
5. Write neatly and legibly.
6. If answers are not presented according to the instructions of each question, candidates will lose marks.
7. ALL drawings should be done in pencil and labelled in ink.
8. Only draw diagrams and flow charts when requested to do so.
9. The diagrams in the question paper may not necessarily be drawn to scale.
10. The use of graph paper is NOT permitted.
11. Non-programmable calculators, protractors and compasses may be used.

SECTION A

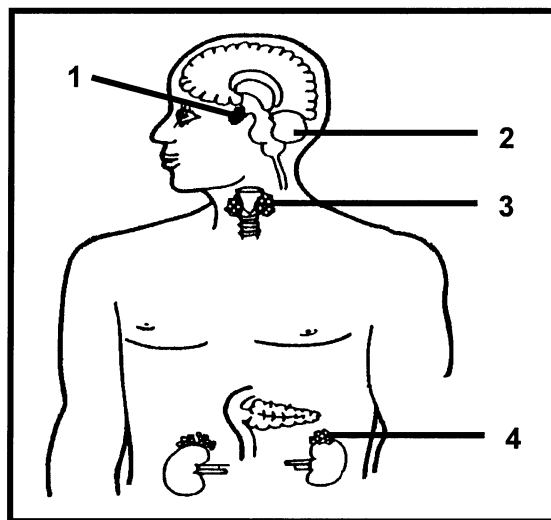
QUESTION 1

1.1 Various possible answers are provided for each question. Indicate the correct answer by writing only the **letter** of your choice next to the relevant question number.

1.1.1 A nephron consists of a Malpighian body and the ...

- A glomerulus.
- B afferent and efferent arterioles.
- C renal tubule.
- D loop of Henlé.

QUESTIONS 1.1.2 and 1.1.3 are based on the following diagram:



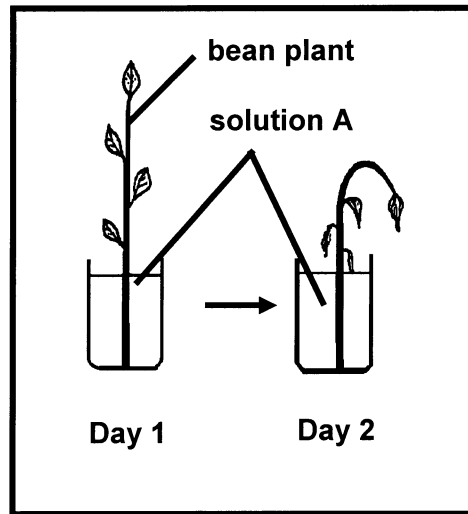
1.1.2 The TWO endocrine glands which secrete hormones that influence the growth of a child are ...

- A 1 and 2.
- B 1 and 3.
- C 1 and 4.
- D 2 and 4.

1.1.3 The TWO endocrine glands that will be stimulated when a person faces an emergency are ...

- A 2 and 3.
- B 1 and 2.
- C 2 and 4.
- D 3 and 4.

- 1.1.4 The diagram below shows the beginning (Day 1) and the end result (Day 2) of an investigation.



Which of the following could explain the state of the bean plant on day 2?

- A Solution A is more concentrated than the cell sap in the cells of the plant
- B Solution A contains very little dissolved salts
- C The cells of the leaves experienced endosmosis
- D The bean plant is adapted to grow in soil with a high salt content
- 1.1.5 Plant growth substances ...
- (i) only promote growth.
- (ii) only inhibit growth.
- (iii) stimulate and inhibit growth.
- (iv) are only produced in the leaves.
- A Only (i) is correct
- B Only (iii) is correct
- C (i) and (iv) are correct
- D (ii) and (iv) are correct
- 1.1.6 Nitrogenous wastes are removed from the body by the ...
- A kidneys and the skin only.
- B kidneys, skin and the liver.
- C kidneys and the liver only.
- D kidneys only.

1.1.7 The function of an interneuron (connector neuron) is to transmit impulses ...

A to the brain.

B to the muscles of the body.

C from a motor neuron to a sensory neuron.

D from a sensory neuron to a motor neuron.

(7 x 2) (14)

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 Openings at the margins of some leaves through which water is lost as droplets

1.2.2 The growth movement in plants in response to gravity

1.2.3 The thin, tough, outer membrane of connective tissue that surrounds each kidney

1.2.4 The cavity inside the human kidney into which the ducts of Bellini open

1.2.5 The structural unit of the nervous system

1.2.6 A rapid, automatic response to a stimulus

1.2.7 A state of inactivity in some animals during winter

1.2.8 The tissue that transports a hormone from its site of production in humans

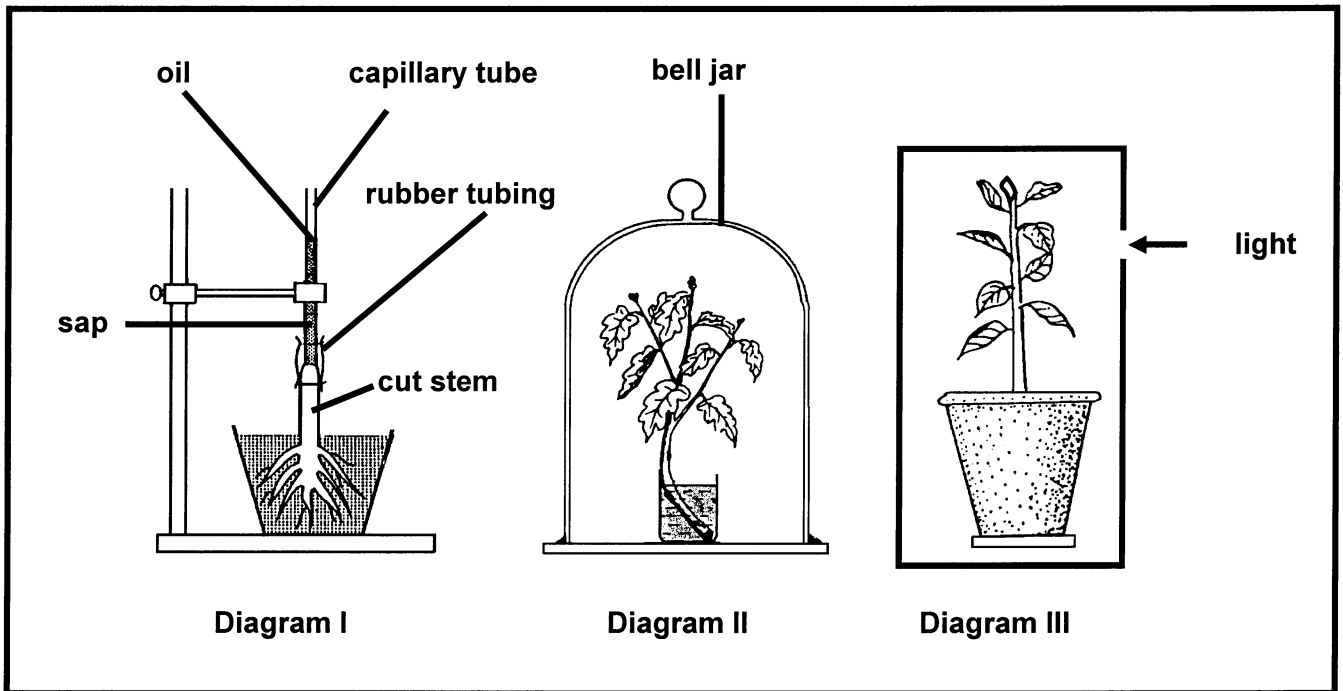
(8)

- 1.3 Match the information in COLUMN II with the items in COLUMN I by writing only the correct **letter** next to the relevant question number.

COLUMN I		COLUMN II	
1.3.1	Co-ordination	A	Converts stimuli to impulses
1.3.2	Tissue fluid	B	Has unevenly thickened cell walls
1.3.3	Sensory neuron	C	Part of the epidermis of the roots of plant
1.3.4	Guard cell	D	The removal of metabolic wastes from the body
1.3.5	ADH	E	Conducts nerve impulses to the central nervous system
1.3.6	Excretion	F	Makes the walls of the collecting duct more permeable to water
		G	A liquid found inside animal cells
		H	A hormone that leads to the dilation of the pupil
		I	Part of the internal environment of mammals
		J	Joint function of the nervous and endocrine systems

(6 x 2) (12)

1.4 Study the following diagrams showing the apparatus used in different investigations to demonstrate various processes in plants:



- 1.4.1 State the **aim** of the investigation using the apparatus shown in:
- Diagram I (1)
 - Diagram II (1)
 - Diagram III (1)
- 1.4.2 Suggest a suitable control for the experiment represented by Diagram III. (2)
- 1.4.3 Give the expected **result** for the investigation represented by:
- Diagram I (1)
 - Diagram II (1)
 - Diagram III (1)
- 1.4.4 Account for the difference in result that would be expected between the control and the experiment represented by Diagram III. (2)
- 1.4.5 Explain why a sharp knife should be used to cut the stem in Diagram I. (2)
- 1.4.6 Explain how the apparatus in Diagram II can be improved to obtain reliable results. (2)

- 1.4.7 Explain why the apparatus shown in Diagram II should **not** be kept in very bright sunlight.

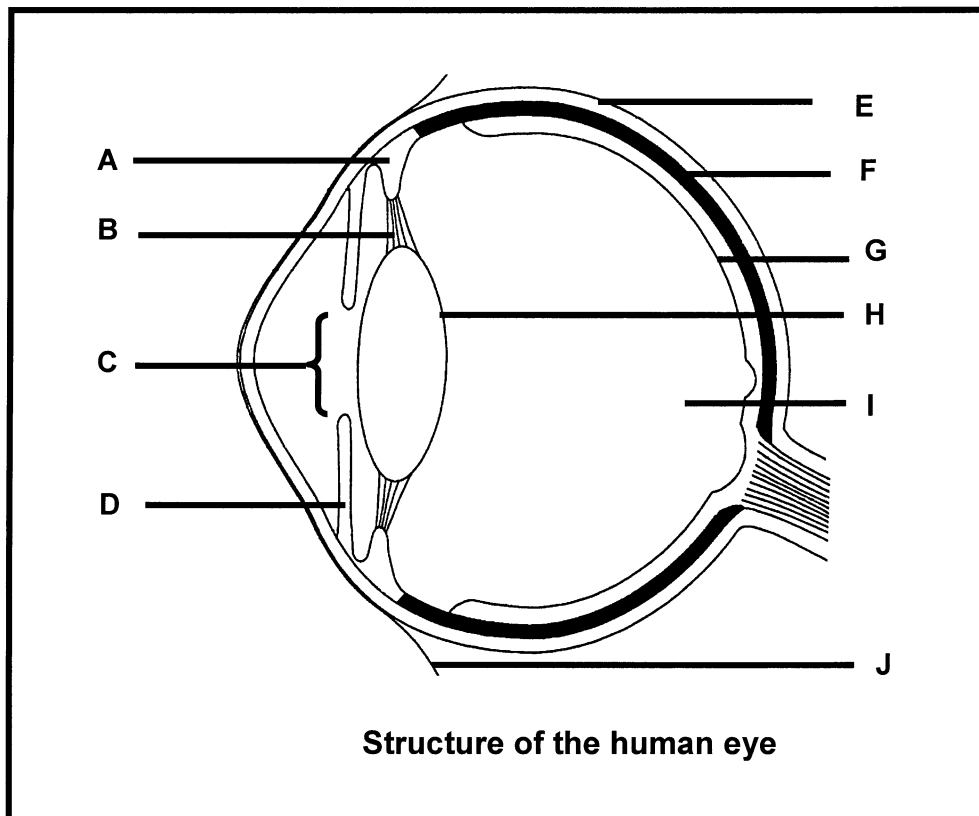
(2)
(16)

TOTAL QUESTION 1: 50
TOTAL SECTION A: 50

SECTION B

QUESTION 2

- 2.1 Study the following diagram and answer the questions that follow:



- 2.1.1 Identify each of the following parts:

- (a) E (1)
- (b) F (1)
- (c) J (1)

- 2.1.2 Choose the **letter(s)** of the part(s) which:

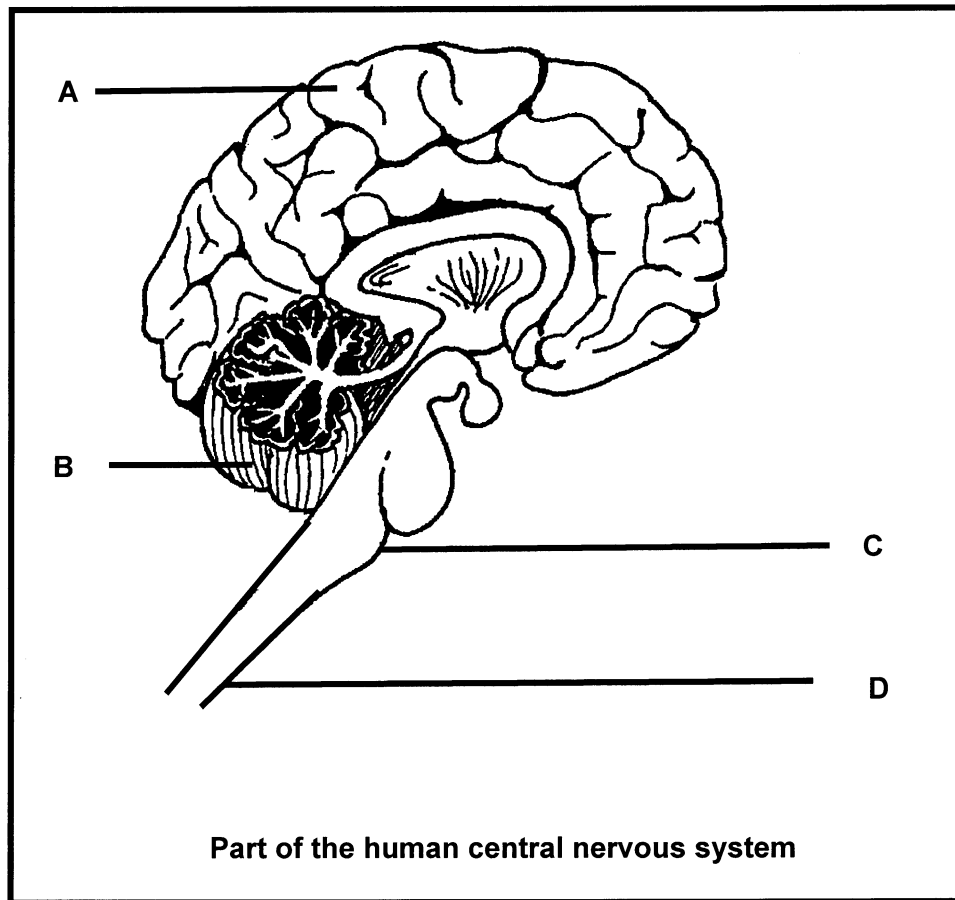
- (a) Undergo a change when the intensity of the light changes (2)
- (b) Undergo a change when the distance of the object from the eye changes (3)
- (c) Lead to total blindness if it is non-functional (1)

- 2.1.3 Explain your answer in QUESTION 2.1.2 (c). (3)

- 2.1.4 Explain TWO ways in which part F is structurally suited for its function. (4)
- 2.1.5 Make a labelled diagram to show the front view of parts C and D. (6)
(22)
- 2.2 Answer the following questions based on the tongue as a sensory organ:
- 2.2.1 Name the taste perceived at the back of the tongue. (1)
- 2.2.2 Explain why it is advisable to first rinse your mouth cavity with clean water when you want to determine the taste of any substance. (2)
(3)
- TOTAL QUESTION 2: 25**

QUESTION 3

3.1 Study the diagram below and answer the questions that follow:



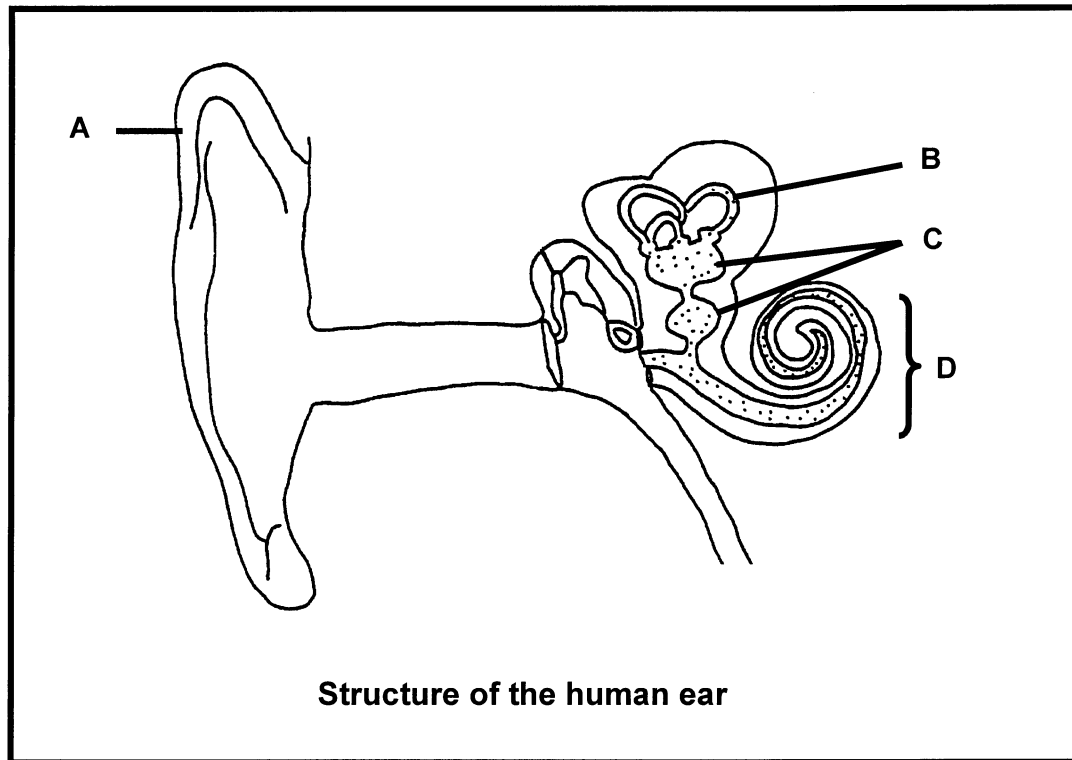
3.1.1 Identify each of the following parts:

- (a) A (1)
- (b) B (1)
- (c) C (1)

3.1.2 Give TWO functions of part D.

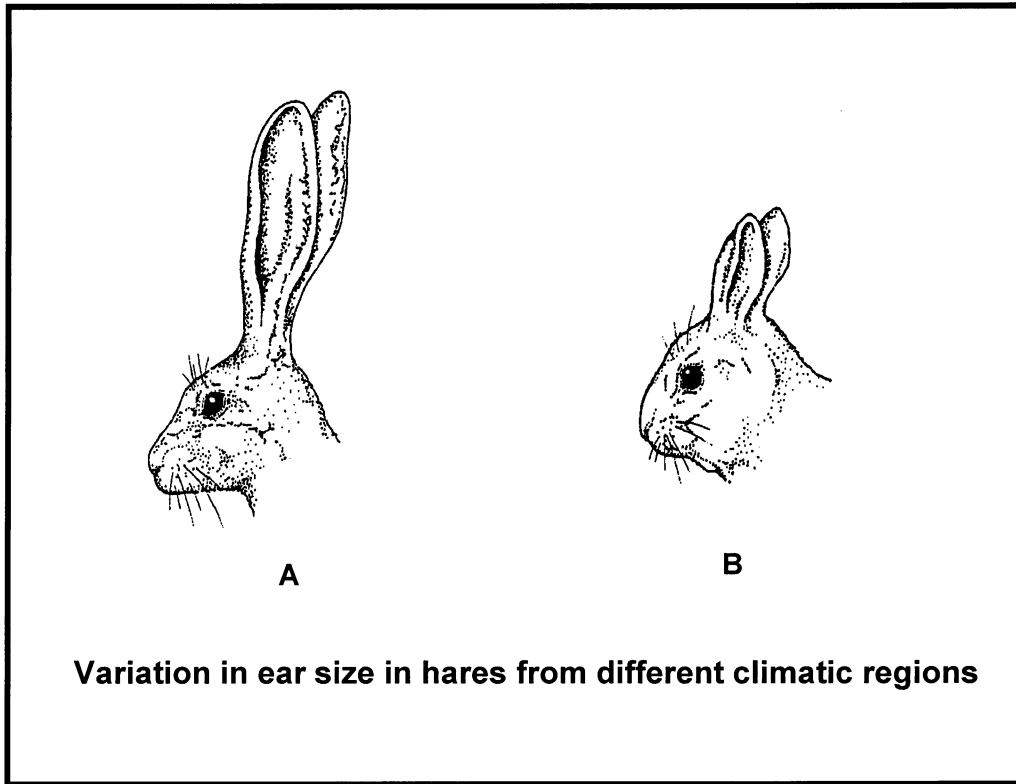
(2)
(5)

3.2 Study the following diagram and answer the questions that follow:



- 3.2.1 Identify part A. (1)
- 3.2.2 Give the **letter** of the part that:
- (a) Plays a role in detecting the movement of the head (1)
- (b) Contains receptors that convert sound stimuli to impulses (1)
- 3.2.3 (a) Will the hearing of a person whose head is submerged in water be improved or worsened? (1)
- (b) Explain your answer in QUESTION 3.2.3 (a). (2)
- 3.2.4 Explain TWO ways in which the middle ear is structurally suited for its function. (4)
- (10)**

3.3 Study the following diagrams and answer the questions that follow:



3.3.1 Which hare (A or B) is better adapted to live in cold regions? (1)

3.3.2 Explain your answer in QUESTION 3.3.1. (3)
(4)

3.4 Explain the importance of each of the following in thermoregulation:

3.4.1 The skin of some lizards becomes lighter in warm weather (2)

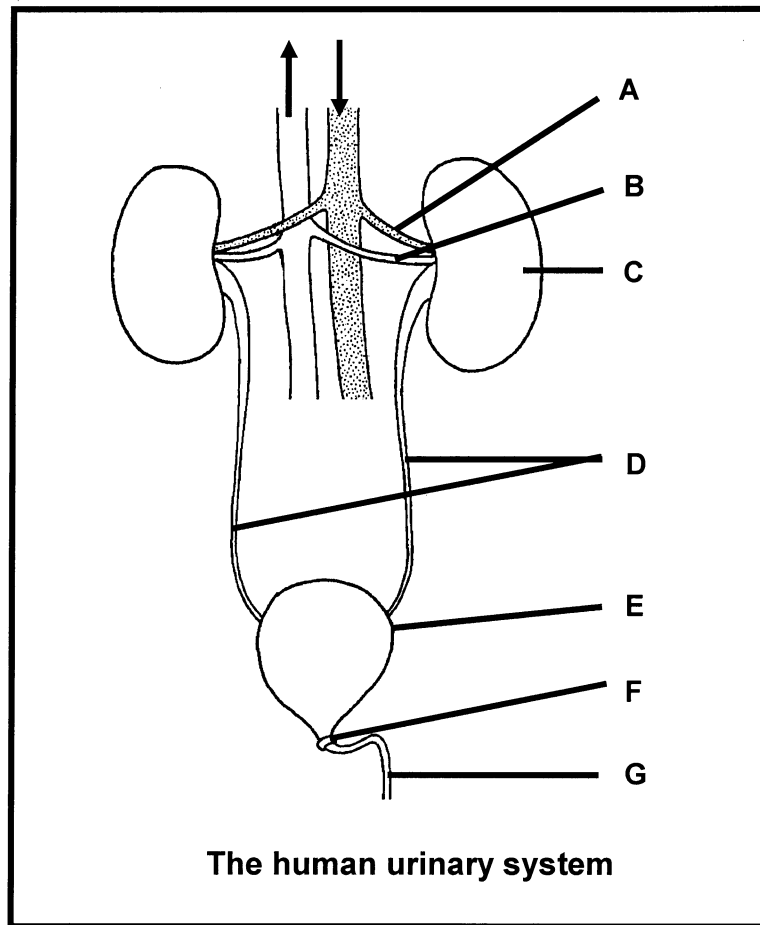
3.4.2 The panting of dogs after they have run fast (2)

3.4.3 The skin capillaries of humans constrict in cold weather (2)
(6)

TOTAL QUESTION 3: 25

QUESTION 4

4.1 Study the following diagram and answer the questions that follow:



4.1.1 Identify each of the following parts:

- (a) C (1)
- (b) F (1)
- (c) G (1)

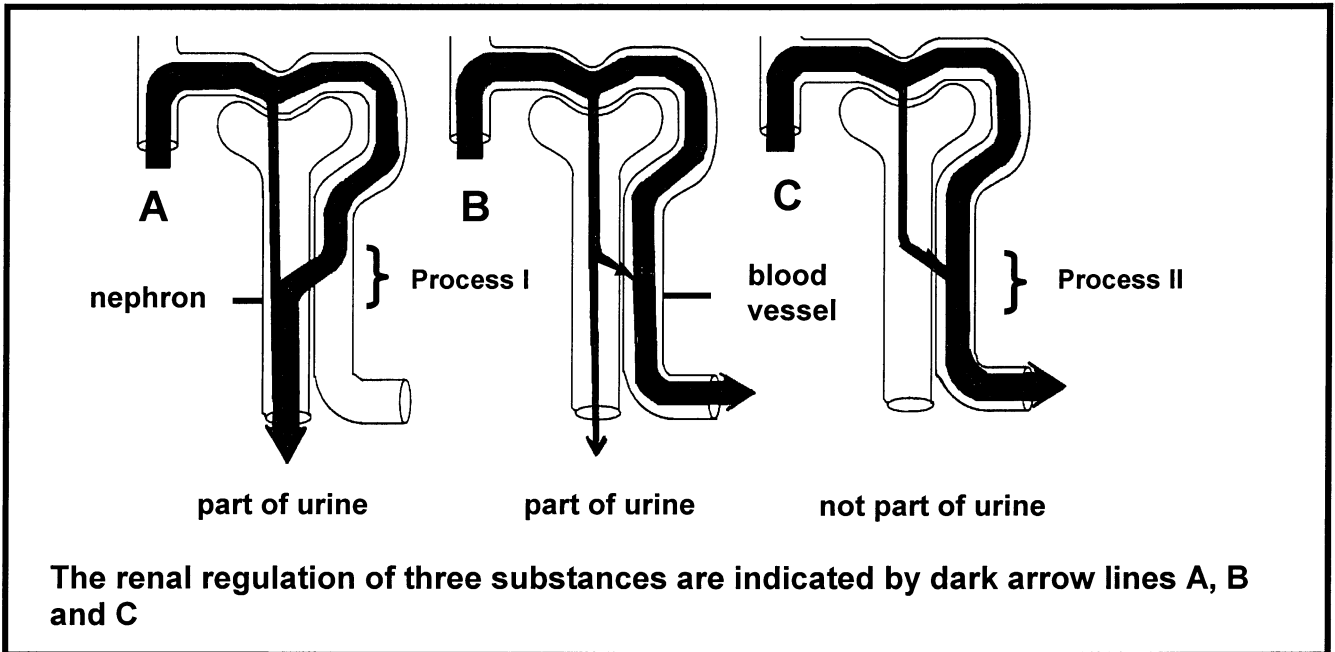
4.1.2 State the function of each of the following parts:

- (a) E (1)
- (b) F (1)

4.1.3 Tabulate THREE differences between the composition of the blood in blood vessels A and B. (7)

4.1.4 Explain the consequences for the human body should the parts indicated by D become blocked. (5)
(17)

4.2 Study the diagram below showing part of a nephron and answer the questions that follow:



4.2.1 What does each of the following represent?

- (a) Process I (1)
- (b) Process II (1)

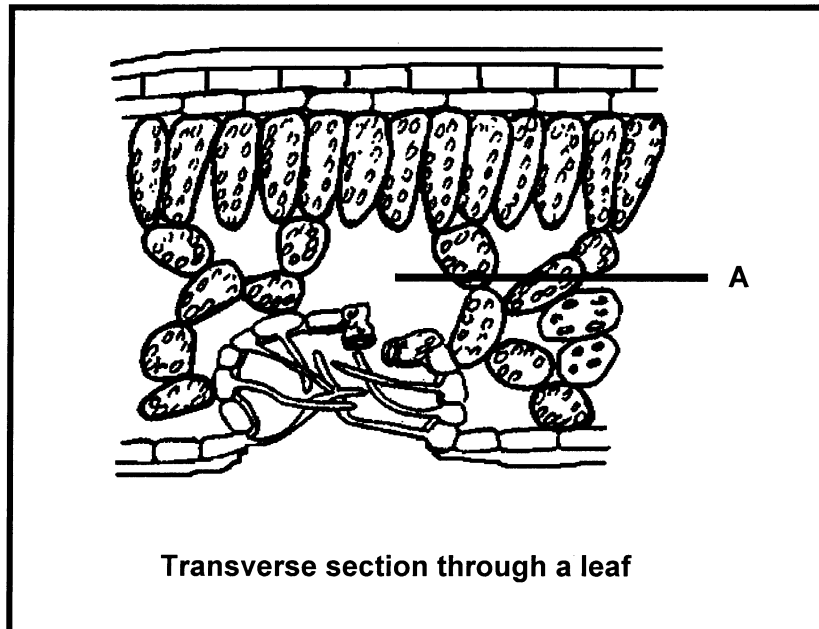
4.2.2 Name and explain which substance (A, B or C) might represent each of the following:

- (a) Glucose (3)
 - (b) Sodium (3)
- (8)**

TOTAL QUESTION 4: 25

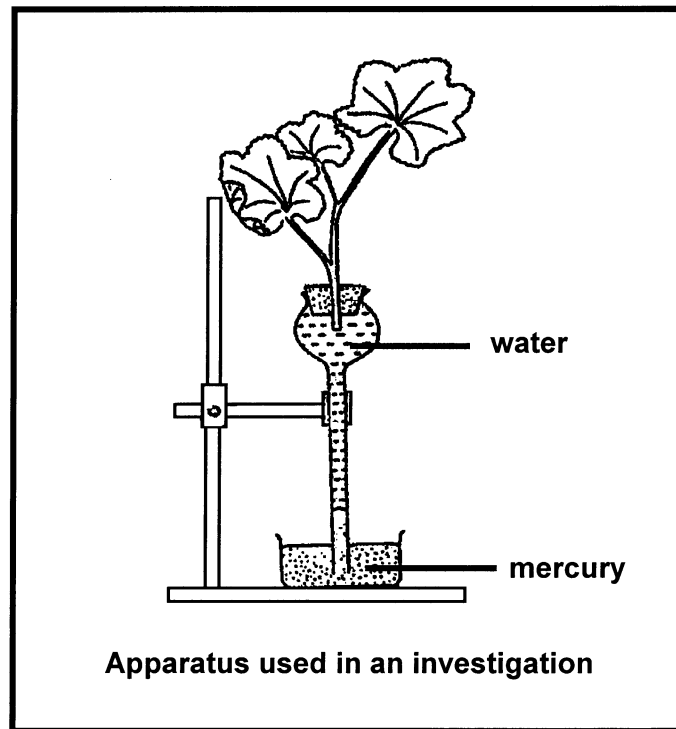
QUESTION 5

- 5.1 Name THREE environmental factors that may influence the rate of transpiration. (3)
- 5.2 Study the following diagram and answer the questions that follow:



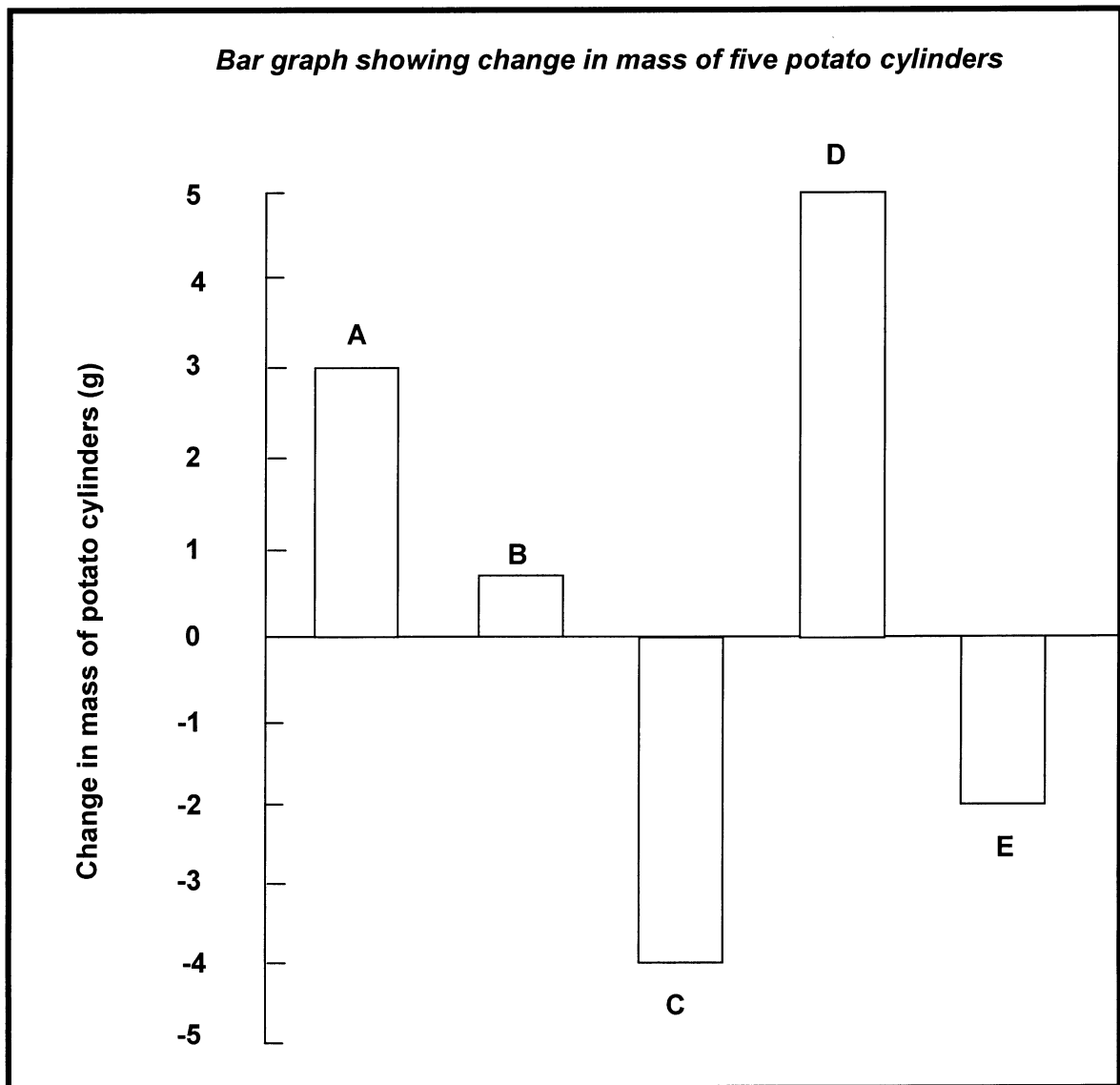
- 5.2.1 Identify part A. (1)
- 5.2.2 Name the type of habitat for which this leaf is suited. (1)
- 5.2.3 Explain FOUR visible characteristics of this leaf to support your answer in QUESTION 5.2.2. (8)
(10)

5.3 Study the following diagram and answer the questions that follow:



- 5.3.1 State the **aim** of the investigation where this apparatus was used. (2)
- 5.3.2 How will the **result** be different if a twig with smaller leaves is used? (1)
- 5.3.3 Explain why:
- (a) Mercury was used (2)
- (b) The stem of the twig was cut underwater (2)
- (7)**

5.4 Study the following bar graph showing the results after five identical cylinders (A to E) of fresh potato, each weighing 15 g, were immersed in sugar solutions of different concentrations for three hours:



5.4.1 Calculate the mass of the potato cylinder that was immersed in the sugar solution with the highest concentration. Show ALL working. (3)

5.4.2 Explain the reason for the change in mass shown by potato cylinder D. (2)
(5)

TOTAL QUESTION 5: 25
TOTAL SECTION B: 100

GRAND TOTAL: 150

