

Name: _____

Teacher's Name: KRS LUD AYR

ST Columba's

C O L L E G E

ST. COLUMBA'S COLLEGE

YEAR 11 BIOLOGY EXAM

Unit 2

SEMESTER 2

2013

Reading Time: 10 minutes

Writing Time: 90 minutes

Structure of Booklet

Section	Marks
Section A: Multiple Choice	25
Section B: Short Answer	50
TOTAL	75

Instructions

Write your name and circle your teacher's name at the top of this booklet.

Students are allowed to bring in pens, pencils, ruler and sharpener. No calculators are allowed.

Circle Multiple Choice answers on the Answer Sheet provided. Answer all Multiple Choice questions.

Answer Short Answer questions in the spaces provided. Answer all Short Answer questions.

SECTION A: MULTIPLE-CHOICE QUESTIONS**Instructions for Section A**

Answer **all** questions in pencil on the answer sheet provided for multiple-choice questions.

Choose the response that is **correct** for the question.

A correct answer scores 1, an incorrect answer scores 0.

Marks will **not** be deducted for incorrect answers.

No marks will be given if more than one answer is completed for any question.

The following information relates to Questions 1 and 2.

The Euro is a small wallaby, living in the desert regions of the Pilbara in Western Australia. They shelter in rocky outcrops during the day. These wallabies are able to survive on limited water as they can lose 12% of their body water without being adversely affected. They are unable to sweat, however can pant 300 times per minute. They also lick their relatively hairless forelimbs when hot.

Question 1

A physiological adaptation of the Euro to survive in this hot environment is

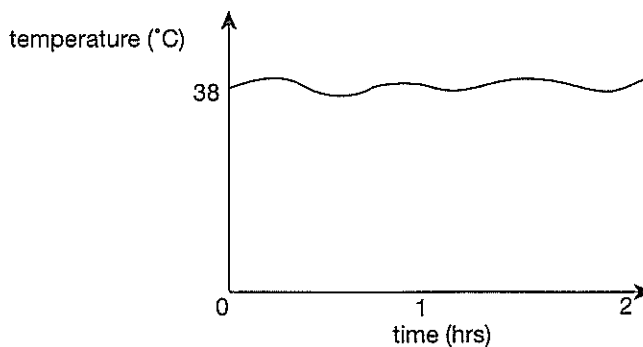
- A. relatively hairless forearms.
- B. an inability to sweat.
- C. its ability to survive after losing body water.
- D. its ability to pant at a high rate.

Question 2

A structural adaptation of the Euro to conserve water is

- A. relatively hairless forearms.
- B. a lack of sweat glands.
- C. licking its forearms.
- D. its ability to pant at a high rate.

The following graph represents a reptile in its natural environment.

**Question 3**

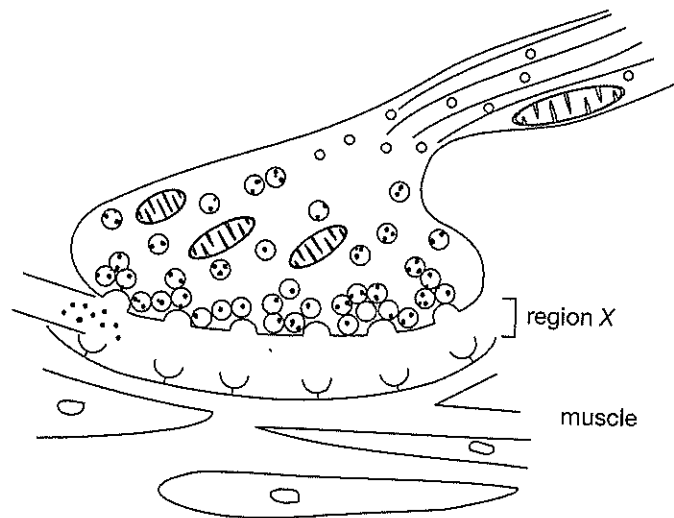
The organism is able to maintain its body temperature through

- A. homeothermy.
- B. structural adaptations.
- C. physiological adaptations.
- D. behavioural adaptations.

Question 4

When the nervous and endocrine systems are compared, the nervous system

- A. does not rely on chemical messengers.
- B. requires the circulatory system to carry messages.
- C. is a faster form of communication.
- D. has prolonged responses.

Question 5

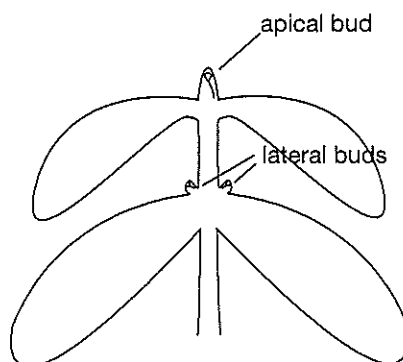
The diagram above is of a synapse, the junction between a neuron and a muscle cell.

In region *X*

- A. the action potential jumps across the gap.
- B. sodium ions carry the electrical charge.
- C. chemicals enter region *X* by endocytosis.
- D. neurotransmitter diffuses.

Use the following information to answer Questions 6 and 7.

The diagram below illustrates the buds in the shoot tip of a plant.



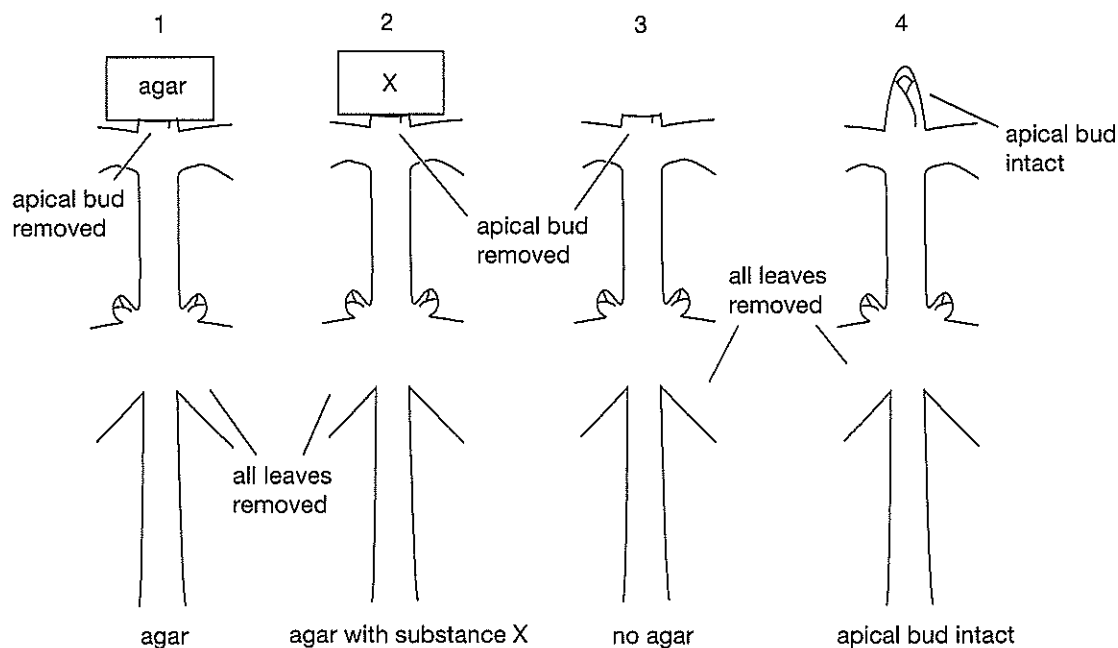
A substance, X, produced in the apical bud, moves down the stem and inhibits lateral bud growth.

Question 6

Substance X is

- A. ethylene.
- B. auxin.
- C. gibberellins.
- D. cytokinins.

In a series of experiments, investigations of apical dominance were undertaken as illustrated below.



Agar is a jelly which, alone, has no effect on plants. It can, however, be used to absorb chemicals.

Question 7

Lateral bud growth would be expected in

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

Question 8

When a newly born babies palm is touched, it automatically grasps the finger.

This is an example of

- A. learnt behaviour.
- B. innate behaviour.
- C. imprinting.
- D. habituation.

Question 9

People living along railway lines are initially disturbed by the intermittent noise. Over a period of time, the train noise no longer disturbs the inhabitants.

No longer being disturbed is an example of

- A. learnt behaviour.
- B. instinct.
- C. conditioning.
- D. habituation.

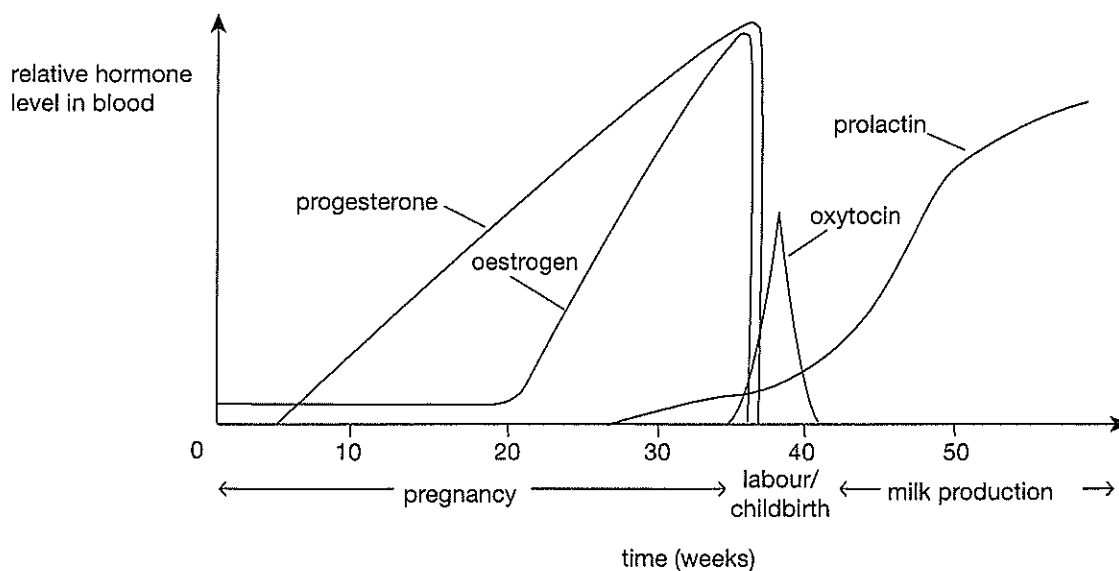
Question 10

Learnt behaviour is

- A. the product of experience.
- B. instinctive.
- C. innate.
- D. an interaction of inherited and environmental factors.

Use the following information to answer Questions 11 and 12.

The following graph shows the hormone levels in a woman prior to and after childbirth.



Question 11

From the above graphs, the hormone which is the likely to stimulate contractions for labour is

- A. high level of oestrogen.
- B. high level of oxytocin.
- C. high level of progesterone.
- D. low levels of prolactin.

Question 12

The hormone(s) for maintaining pregnancy

- A. is progesterone only.
- B. is oestrogen only.
- C. are progesterone and oestrogen.
- D. is oxytocins.

Use the following information to answer Questions 13–15.

In a woodpile, cockroaches, centipedes, snails and millipedes feed on the organic matter. Rats nest amongst the timber, feeding on the snails and arthropods. The rats also enter a chicken coop and feed on grains, left over vegetable scraps and the occasional egg.

Question 13

The number of producers in the woodpile is

- A. 0
- B. 1
- C. 2
- D. 4

Question 14

Cockroaches, centipedes, snails and millipedes in this woodpile are

- A. decomposers.
- B. detritivores.
- C. herbivores.
- D. carnivores.

Question 15

In terms of feeding behaviour, when the rats eat the eggs, they are

- A. first order consumers.
- B. second order consumers.
- C. third order consumers.
- D. fourth order consumers.

Question 16

The interaction of biotic and abiotic factors in a particular place is

- A. a niche.
- B. an ecosystem.
- C. a community.
- D. a habitat.

Use the following information to answer Questions 17–19.

The symbols below refer to the effect of a factor on an organism.

- + benefit to organism
- harm to the organism
- 0 no effect to the organism

Question 17

Lichen are a crusty-like growth, commonly found on terracotta-tiled roofs. Two different organisms, algae and a fungi depend upon each other and make up the lichen. This is a symbiotic relationship.

The relationship of the fungi and algae would be represented respectively by

- A. ++
- B. --
- C. +–
- D. +0

Question 18

Mistletoe is a parasitic plant on a eucalyptus tree.

The relationship of the mistletoe and the eucalyptus tree would be represented respectively by

- A. ++
- B. --
- C. +–
- D. +0

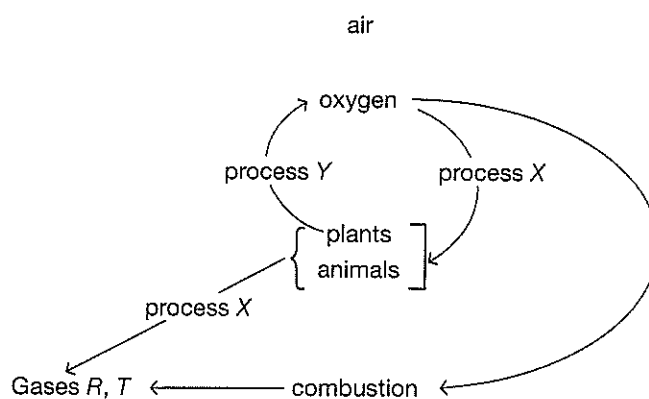
Question 19

A dingo catching and eating a bandicoot would be represented respectively by

- A. ++
- B. --
- C. +–
- D. +0

Use the following information to answer Questions 20–22.

The diagram below is of an oxygen cycle.



Question 20

Process Y represents

- A. photosynthesis.
- B. cellular respiration.
- C. aerobic respiration.
- D. decomposition.

Question 21

Gases R and T represent

- A. water and methane.
- B. nitrogen and carbon dioxide.
- C. water and carbon dioxide.
- D. ozone and carbon dioxide.

Question 22

Process X represents

- A. photosynthesis.
- B. denitrification.
- C. nitrogen fixation.
- D. aerobic respiration.

Question 23

The hormone responsible for water regulation is

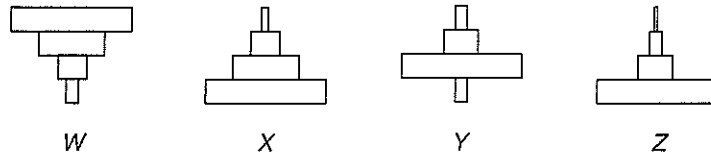
- A. ADH.
- B. adrenalin.
- C. thyroxine.
- D. insulin.

The following information relates to Questions 24 and 25

Below are two food chains and four pyramids.

I phytoplankton → daphnia → fish → pelican

II trees → insects → sparrow → hawk



Question 24

Considering food chain I, the number and biomass pyramids would best be represented by

	Number	Biomass
A.	X	X
B.	Y	X
C.	X	W
D.	Y	W

Question 25

Considering food chain II, the number and energy pyramid would best be represented by

	Number	Energy
A.	X	Z
B.	Y	W
C.	Y	Z
D.	X	Y

END OF SECTION A

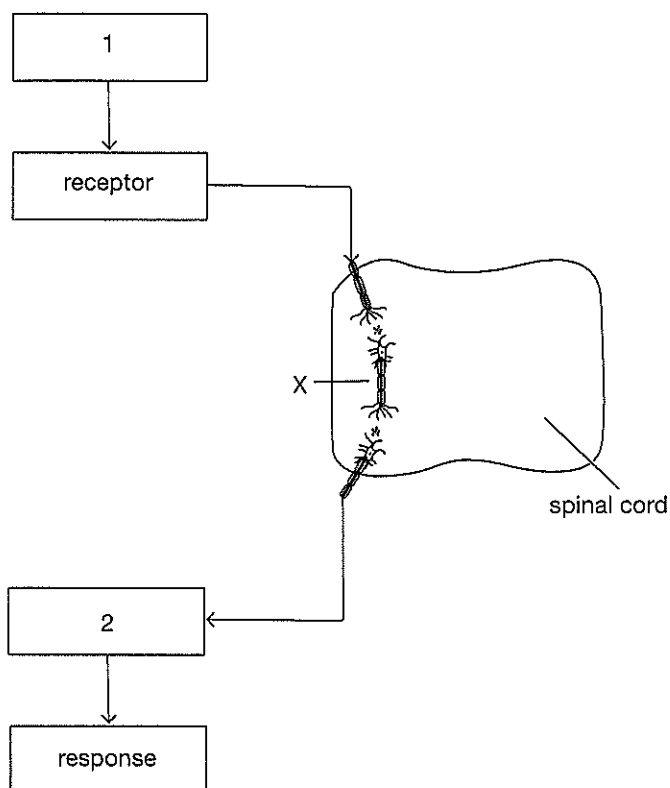
SECTION B: SHORT-ANSWER QUESTIONS**Instructions for Section B**

Answer this section in pen.

Answer **all** questions in the spaces provided.

Question 1 (7 marks)

The diagram below represents a reflex arc.



- a. Name components 1 and 2.

2 marks

- b. What type of neuron is X? Give a specific feature which distinguishes it from other neurons.

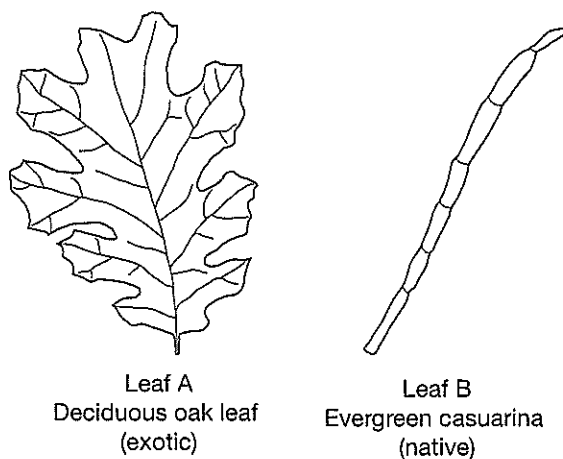
2 marks

- c. Give an example of a reflex action. 1 mark

- d. Explain how a reflex arc differs from a negative feedback pathway. 2 marks

Question 2 (6 marks)

The diagrams below represent two leaves – one introduced from the United Kingdom and the other native to Australia.



- a. The modified leaves of the Casuarina are a structural adaptation.

- i. Define the term adaptation. 2 marks

- ii. Explain an advantage these modified leaves give to the plant. 2 marks

- b. Leaf A has a large surface-area-to-volume ratio when compared to leaf B.

Name **two** abiotic factors of leaf A's environment that make this feature an advantage for survival.

2 marks

Question 3 (7 marks)

Human body temperature is 37°C and is under homeostatic control. There are mechanisms within the body to both raise and lower the body temperature and to do so information must be conveyed to and from the brain, specifically the hypothalamus.

- a. i. Define homeostasis. 2 marks

- ii. What is the mechanism of homeostasis? 1 mark

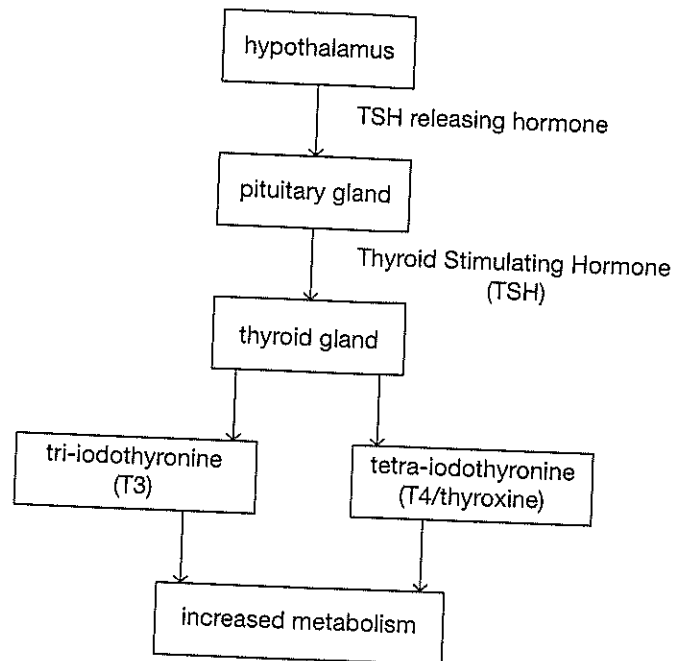
- b. i. Through which system does information travel to the hypothalamus? 1 mark

- ii. Name a feature of this system which distinguishes it from the endocrine system. 1 mark

- c. If a person's core body temperature is higher than the set point, name **one** physiological and **one** behavioural adaptation which could reverse this. 2 marks

Question 4 (7 marks)

The following pathway shows the regulation of metabolism.



- a. How are hormones transported around the body?

1 mark

- b. If, in the diagram above, the pituitary gland was unable to detect TSH, what effect would this have on thyroxine production?

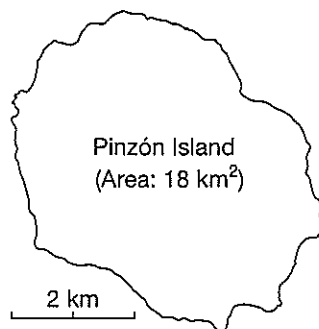
1 mark

- c. Goitre, a swelling of the thyroid gland in the neck, is due to a lack of iodine in the diet. Iodine absorbed in the small intestine is used by the thyroid to synthesise hormones.
- i. What effect would lack of iodine have on metabolism? 1 mark
- _____
- ii. Write a hypothesis for the observation that goitre was linked to iodine in the diet. 1 mark
- _____
- _____
- iii. Outline how your hypothesis could be tested. 2 marks
- _____
- _____
- _____
- _____
- _____
- _____
- _____
- iv. Iodine is added to bread to prevent goitre. 1 mark
- Why do you think bread was chosen rather than other food types?
- _____
- _____
- _____

Question 5 (9 marks)

Pinzón Island is part of the Galapagos Island group in South America. Pinzón Island is the home to giant tortoises, lava lizards, Darwin's finches and an estimated 180 million rats.

The following map represents Pinzón Island.



- a. What is the estimated density of rats on the island? 1 mark

The Ecuadorian Government and a coalition of conservation groups have undertaken a program of poisoning rats. Helicopters have been used to drop 22 tonnes of poisoned bait 'blue cereal' to eradicate the rats. They see the effect of rats on the flora and fauna is far greater than the effects of this action on native species.

Rats are not native to the island.

- b. i. Explain how rats could have arrived on the island. 2 marks

- ii. Explain why the rats were able to reach such plague proportions. 2 marks

- c. Describe an effect rats could have on

- i. flora. 1 mark

- ii. fauna. 1 mark

- d. What are some possible consequences to native fauna of this extensive poisoning? 2 marks

Question 6 (7 marks)

- a. Many Eucalyptus trees have a thick bark which is an adaptation to survive fire.
Explain the importance of the thick bark to the survival of the trees. 2 marks

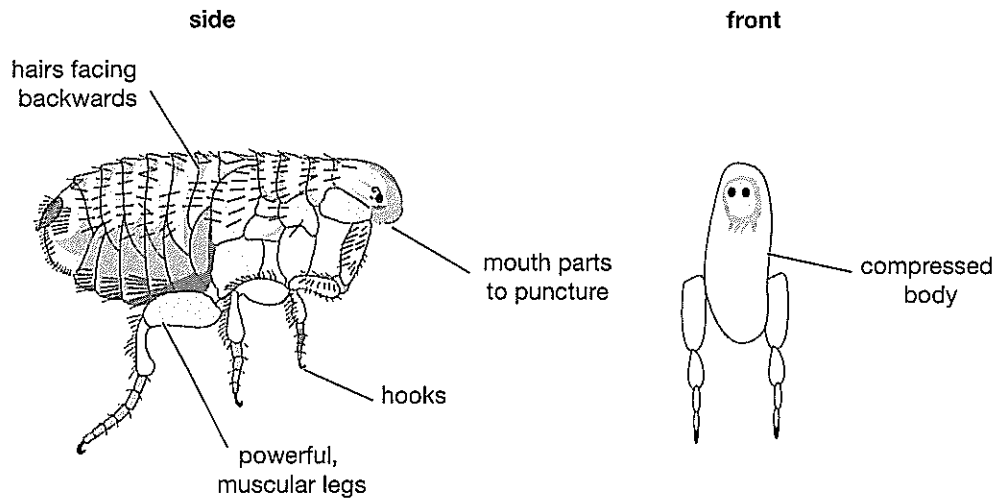
- b. What are **two** advantages gained by the Australian ecosystem of periodic burning? 2 marks

- c. Prior to European settlement, Aborigines set fire to areas of bush to assist their hunter-gatherer lifestyle.
Outline a possible advantage of this periodic burning. 1 mark

- d. Apart from burning of forests/vegetation, name **two** other processes which contribute to Greenhouse Gas emissions. 2 marks

Question 7 (7 marks)

Fleas are commonly found feeding on dogs, sucking blood and sheltering amongst the hair. Head lice lay eggs around the hair line and around the ears. Adult lice live in the hair and feed on blood from the scalp.



- a. i. Define the term niche. 1 mark

- ii. Give **two** components of the niches that lice and fleas have in common. 2 marks

- b. Name and describe a structural adaptation the flea has to finding a new host. 2 marks

- c. Lice on humans are of two types; head lice which only live on the head and pubic lice which only live in pubic hair.

Outline **two** components of the environment which would restrict each species to their respective habitats. 2 marks

END OF QUESTION AND ANSWER BOOKLET