Neap:

Trial Examination 2013

VCE Biology Unit 2

Written Examination

Question and Answer Booklet

Reading time: 15 minutes
Writing time: 2 hours

Student's Name: _____

Teacher's Name: _____

Structure of Booklet

Section	Number of questions	Number of questions to be answered	Number of marks
A	25	25	25
B	7	7	50
			Total 75

Students are permitted to bring into the examination room: pens, pencils, highlighters, erasers, sharpeners and rulers. Students are NOT permitted to bring into the examination room: blank sheets of paper and/or white out liquid/tape. No calculator is allowed in this examination.

Materials supplied

Question and answer booklet of 17 pages.

Answer sheet for multiple-choice questions.

Instructions

Write your **name** and **teacher's name** on this booklet and in the space provided on the answer sheet for multiple-choice questions. All written responses must be in English.

At the end of the examination

Place the answer sheet for multiple-choice questions inside the front cover of this booklet and hand them in.

Students are NOT permitted to bring mobile phones and/or any other unauthorised electronic devices into the examination room.

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.

Use the following information to answer Questions 1 and 2.

Female dogs produce scents which alert other dogs that they have or will ovulate.

Question 1

The type of adaptation the production of these scents represents is

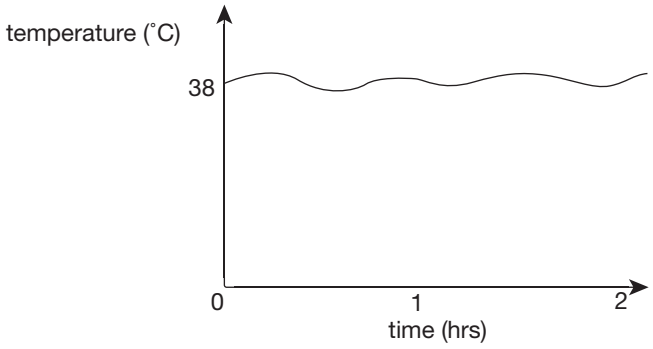
A. physiological.
B. structural.
C. reproductive.
D. behavioural.

Question 2

These scents would be classed as

A. hormones.
B. neurotransmitters.
C. pheromones.
D. enzymes.

The following graph represents a reptile in its natural environment.



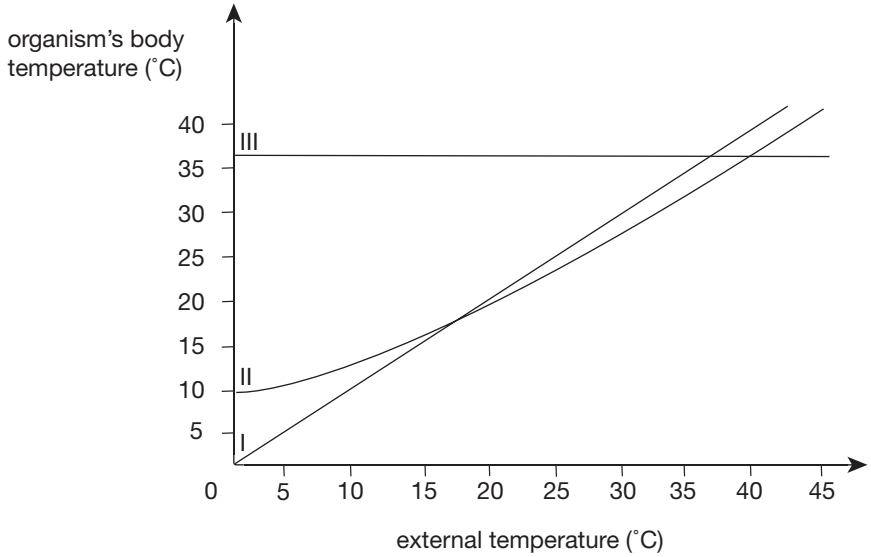
Question 3

The organism is able to maintain its body temperature through

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

Use the following information to answer Questions 4 and 5.

The following graph show three different organisms' (I, II and III) body temperature changes with respect to the change external temperature.



Question 4

Organism II

A. is homeothermic.

B. is able to generate heat through metabolic processes.

C. could be a bird.

D. would sweat at body temperatures greater than 37°C.

Question 5

At an external temperature of 10°C

A. organism I would be shivering.

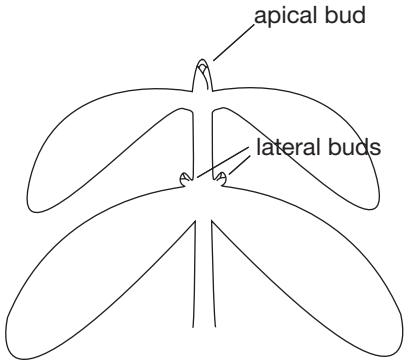
B. behavioural adaptations would produce heat within organism III.

C. all organisms can raise their body temperature above 10°C.

D. organism II would produce more heat than it loses to the environment.

Use the following information to answer Questions 6 and 7.

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



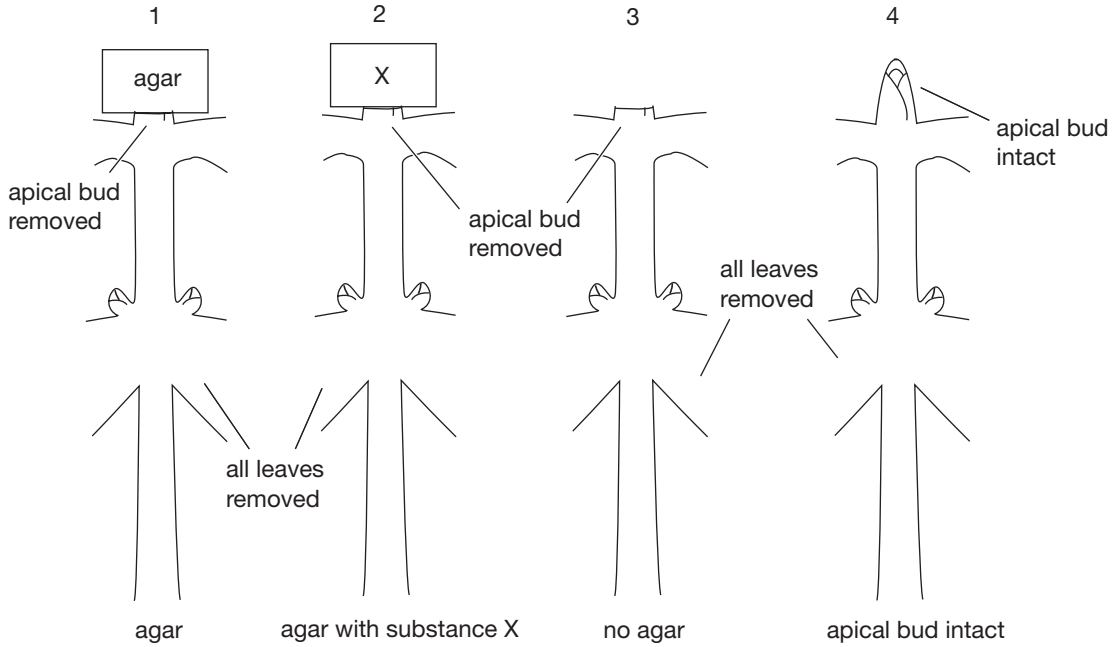
A substance, X, produced in the apical bud, moves down the stem and inhibits lateral bud growth.

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.

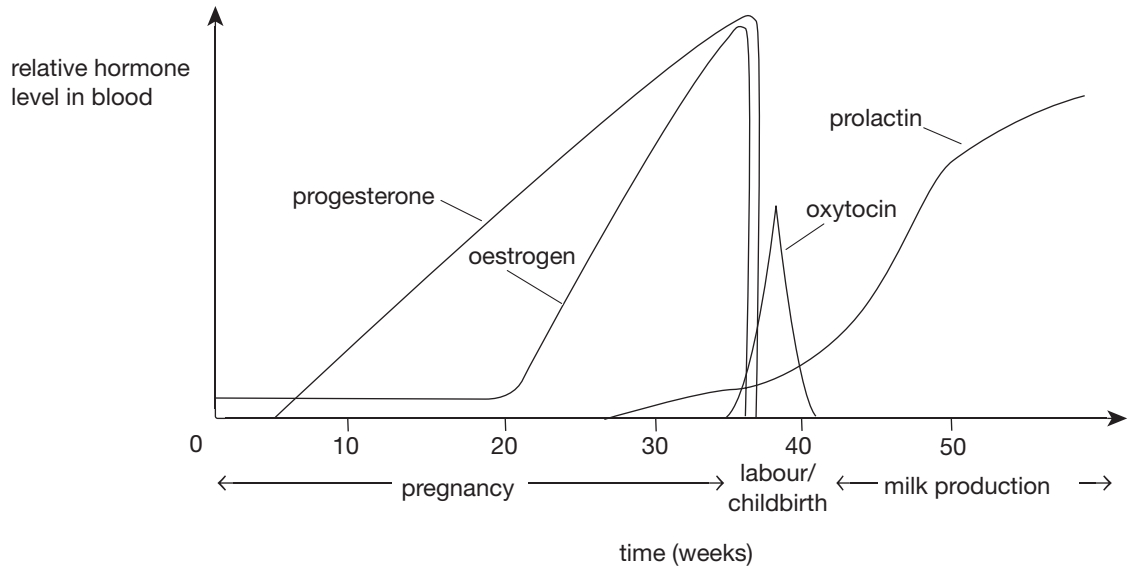
Question 10

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. + +

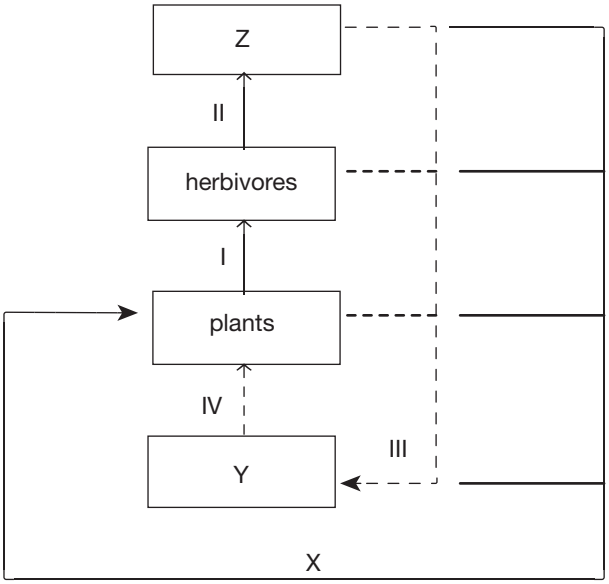
B. – –

C. + –

D. + 0

Use the following information to answer Questions 20–22.

The diagram below is a representation of a food chain, including gas, inorganic nutrients and energy flow.



Question 20

Gas X is

A. oxygen.
B. nitrogen.
C. carbon dioxide.
D. methane.

Question 21

Z and Y represent

	Z	Y
A.	producer	decomposer
B.	decomposer	producer
C.	carnivore	producer
D.	carnivore	decomposer

Question 22

I, II, III and IV represent

		Organic material	Inorganic material	Energy
A.	I		×	×
B.	II	×	×	×
C.	III	×		×
D.	IV	×	×	×

Use the following information to answer Questions 23–25.

The table below outlines the persistence and biodegradability of various chemicals.

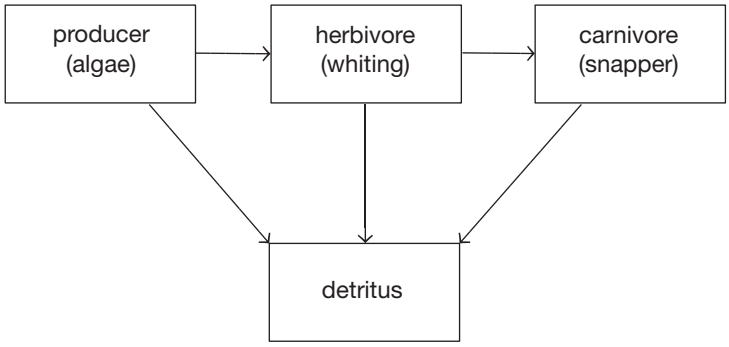
Chemical	Persistence	Biodegradable
Organochlorine, e.g. dieldrin	10 years	no
Heavy metals, e.g. mercury	forever	no
Herbicides, e.g. glycophosphate	2 weeks	yes

Question 23

Organisms responsible for biodegradation are

A. producers.
B. all consumers.
C. detritivores.
D. decomposers.

The food web below is a bay ecosystem.



Question 24

If all the substances above ended up in water ways which feed the bay and enter the producers, it would be expected that the organisms with the highest amount of dieldrin would be

A. algae.
B. whiting.
C. snapper.
D. detritus.

Question 25

The component of the food web with the highest level of mercury would be

A. algae.
B. whiting.
C. snapper.
D. detritus.

END OF SECTION A

SECTION B: SHORT-ANSWER QUESTIONS

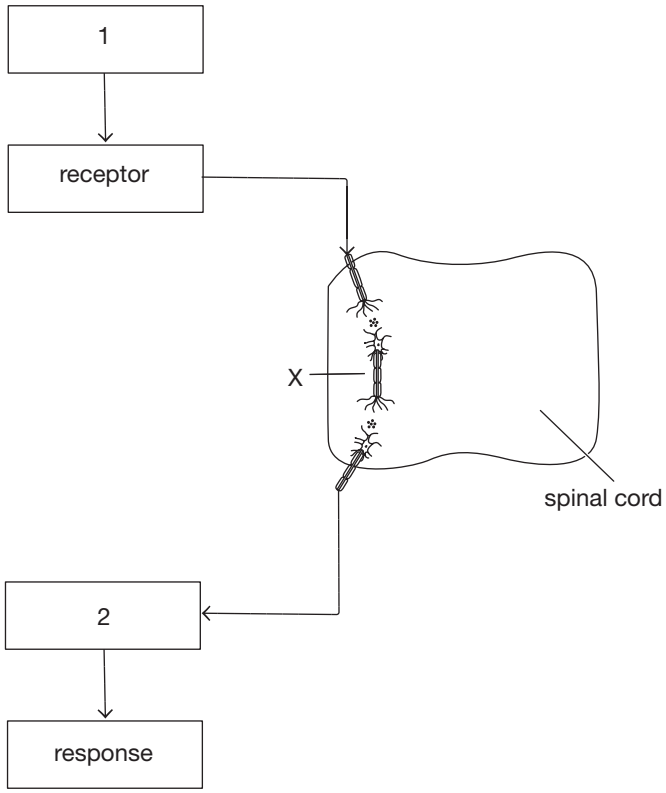
Instructions for Section B

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

_____

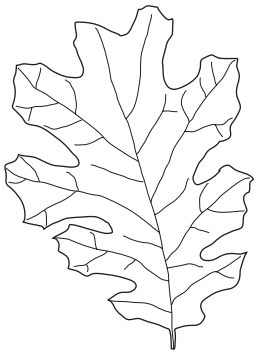
_____

_____

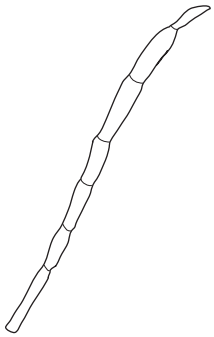
_____

Question 2 (6 marks)

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



Leaf A
Deciduous oak leaf
(exotic)



Leaf B
Evergreen casuarina
(native)

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

_____

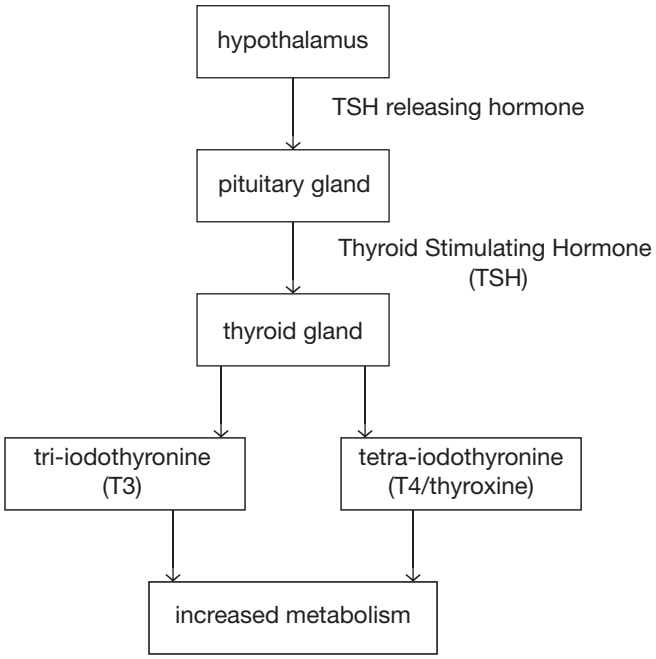
c. If a person's core body temperature is higher than the set point, name **one** physiological and **one** behavioural adaptation which could reverse this. 2 marks

_____

_____

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.
Why do you think bread was chosen rather than other food types? 1 mark

_____

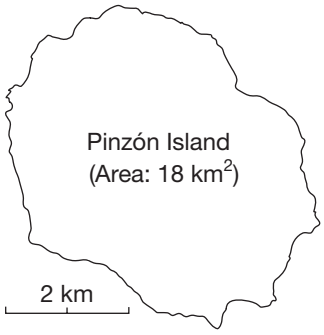
_____

_____

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

_____

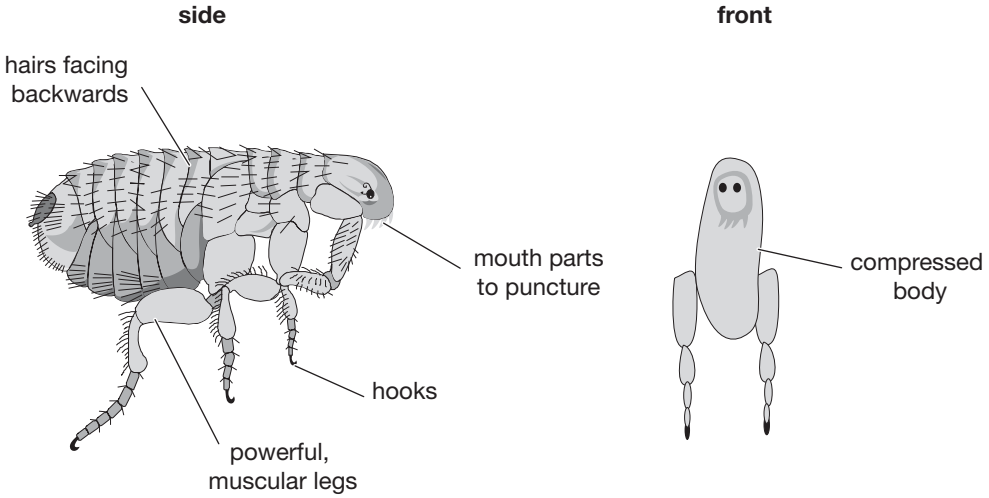
d. Apart from burning of forests/vegetation, name **two** other processes which contribute to Greenhouse Gas emissions. 2 marks

_____

_____

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