

Teacher's Name: GLS LUD MAN AYR

Name: \_\_\_\_\_

## ST. COLUMBA'S COLLEGE



# YEAR 11 BIOLOGY EXAM Unit 2

## SEMESTER 2 2010 EXAM

Reading Time: 10 minutes

Writing Time: 90 minutes

### Structure of Booklet

Section	Marks
Section A: Multiple Choice	50
Section B: Short Answer	50
<b>TOTAL</b>	<b>100</b>

### Instructions

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

**Students are allowed to bring in pens, pencils, highlighter, ruler and sharpener. No calculators or white out are allowed.**

Shade in Multiple Choice questions **on the Answer Sheet provided**. Answer **all** Multiple Choice questions.

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

## **Section A : Multiple Choice.**

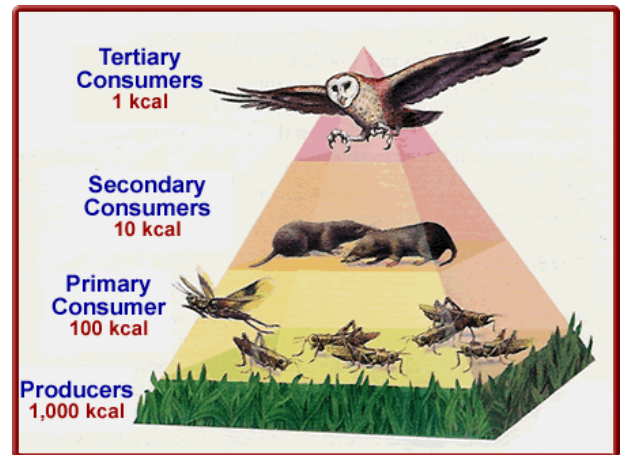
*Shade in one answer only.*

### **Question 1.**

The picture opposite shows an energy pyramid from a woodland ecosystem.

According to this pyramid, the amount of energy that is passed from one trophic level to the next is

- A. 1%.
- B. 10%.
- C. 100%.
- D. 1000%.



### **Question 2.**

Caves tend to be environments that lack nutrients and light. As such, the life that exists within caves is heavily dependent upon nutrients that are brought in from outside. In some cave communities, bats bring nutrients deep into the cave which in turn can feed the various organisms living far from the entrance. This nutrient usually takes the form of bat droppings (guano) that accumulates on the floor of the cave.

Which of the following statements is true for the cave ecosystem described above?

- A. Bats are producers in this ecosystem.
- B. The organisms inside the cave still rely on sunlight for survival.
- C. There would be no decomposers in the cave ecosystem.
- D. Green plants would grow in areas where there was sufficient moisture.

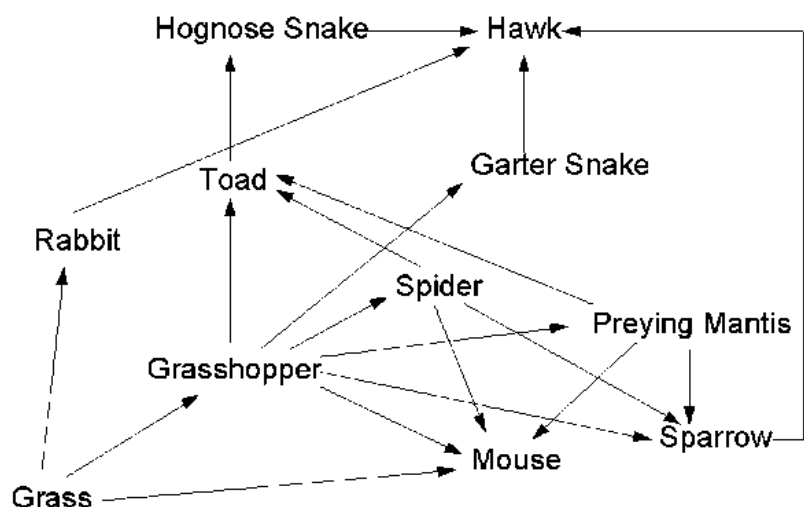
***Refer to the following information to answer Questions 3 to 5.***

The diagram opposite shows a food web from a terrestrial ecosystem.

### **Question 3.**

The number of primary consumers in this food web is

- A. One
- B. Three
- C. Six
- D. Ten



**Question 4.**

Persistent Organic Pollutants (POPs) are toxic compounds that are produced by humans in industry and are not readily broken down. In the food web shown above, POPs would present the greatest health threat to

- A. Grasses
- B. Toads
- C. Hognose snakes
- D. Hawks

**Question 5.**

An omnivore in this food web is the

- A. Grasshopper
- B. Mouse
- C. Spider
- D. Hawk

**Refer to the following information to answer Questions 6 to 7.**

*Tasmanian devils (Sarcophilus harrisii) are found in coastal heaths and eucalypt forests. It is mainly a scavenger and feeds on whatever is available. Powerful jaws and teeth enable it to completely devour its prey - bones, fur and all. Wallabies, and various small mammals and birds, are eaten - either as carrion or as prey. Reptiles, amphibians and insects have also been found in the stomachs of wild devils. Carcasses of sheep and cattle provide food in farming areas.*

*The Tasmanian devil is nocturnal (active after dark). During the day it usually hides in a den, or dense bush. It roams considerable distances - up to 16 km - along well-defined trails in search of food. It usually ambles slowly with a characteristic gait but can gallop quickly with both hind feet together. Young Tasmanian devils are more agile however and can climb trees. Although not territorial, Tasmanian devils have a home range.*

*Tasmanian devils produce a strong odour when under stress, but when calm and relaxed they don't smell. They also make a variety of noises, from harsh coughs and snarls to high pitched screeches. A sharp sneeze is used as a challenge to other devils and frequently comes before a fight.*

**Question 6.**

The habitat of the Tasmanian devil is best described as

- A. Coastal heaths and eucalypt forests.
- B. Dens within dense bushes.
- C. Tasmania
- D. Farms

**Question 7.**

The odour produced by a Tasmanian devil would most likely be

- A. used to mark its territory within its home range.
- B. produced when fighting with other devils over a carcass.
- C. a type of hormone.
- D. released during the day, rather than at night.

**Question 8.**

The beef tapeworm (*Taenia saginata*) is called a parasite because

- A. it kills its host.
- B. it benefits at the expense of its host.
- C. it lives within the body of another animal.
- D. it cannot produce its own organic matter.

**Question 9.**

Mammals that live in very cold environments have behavioural adaptations that help them to reduce heat loss. One behavioural adaptation could be

- A. reducing the intake of food.
- B. having fur that fluffs out.
- C. curling up into the shape of a ball.
- D. isolating themselves from other individuals.

**Question 10.**

A group of students studied water balance in mice. Each student placed a mouse in a cage with dry food and a water bottle. They measured the amount of water consumed by each mouse every 24 hours. The students assumed that if a mouse was in water balance then the amount of water consumed would be equal to the volume of urine lost by the mouse each day. In making their assumption about water balance, students had overlooked the point that

- A. larger mice would drink more water.
- B. water would be lost in faeces and saliva.
- C. more water would be consumed on hotter days.
- D. urine volume would vary with volume of water consumed.

**Question 11.**

The seeds of many plants cease developing in unfavourable conditions. They can survive for many years in this state which is called

- A. dormancy.
- B. geotropism.
- C. hibernation.
- D. germination.

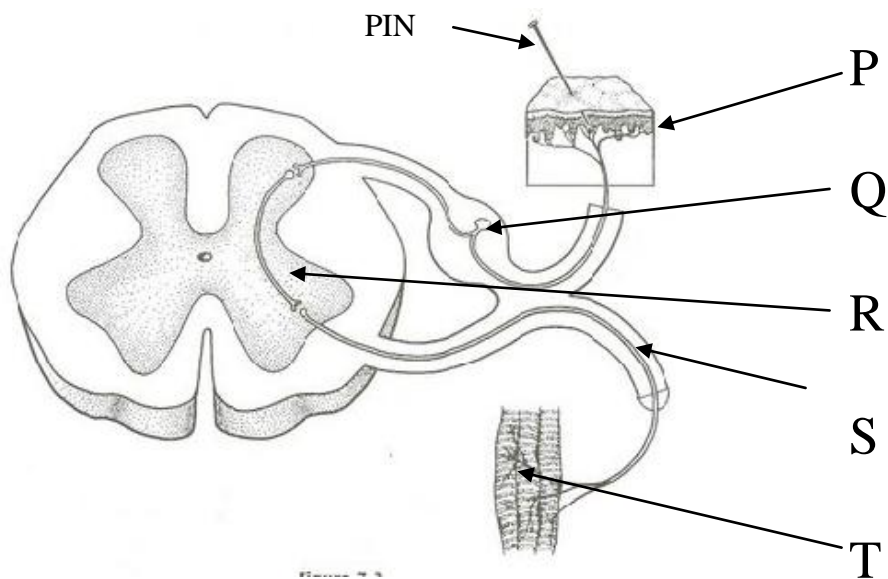
**Question 12.**

The nervous and endocrine systems are the two major regulatory systems of the body. Both systems

- A. take the same time to respond to a stimulus.
- B. have the same duration of response to a stimulus.
- C. use the blood for the transport of their chemical signals.
- D. release chemical signals that act on tissues they control.

**Refer to the following diagram to answer Questions 13 and 14**

The figure below shows the nerve pathways involved in a reflex arc.



**Question 13.**

In this diagram,

- A. P is an effector and T is a receptor.
- B. T represents a muscle.
- C. P represents a gland.
- D. Both P and T are part of the endocrine system.

**Question 14.**

Which of the following correctly describes the types of neurons represented by Q, R and S?

	Neuron Q	Neuron R	Neuron S
A	Sensory	Motor	Intermediate
B	Motor	Sensory	Intermediate
C	Intermediate	Motor	Sensory
D	Sensory	Intermediate	Motor

**Question 15.**

If a stuffed owl is put into a cage with birds, they initially react to it as if it were a real predator. Soon, the birds react less and eventually ignore the stuffed owl. This is an example of

- A. conditioning.
- B. imprinting.
- C. habituation.
- D. innate learning.

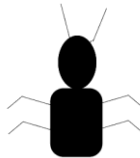
**Question 16.**

The plant hormone responsible for the closure of stomata is

- A. abscisic acid.
- B. ethylene.
- C. auxin.
- D. cytokinin.

*Use the following information to answer questions 17 and 18*

**Organism A**



**Classification key**

- |    |   |                     |                           |
|----|---|---------------------|---------------------------|
| 1. | a | Body in 2 parts     | .....2                    |
|    | b | Body not in 2 parts | .....3                    |
| 2. | a | Antenna present     | .....4                    |
|    | b | Antenna absent      | ..... <i>Felix vert</i>   |
| 3. | a | Body in 3 parts     | ..... <i>Tri grande</i>   |
|    | b | Body in 4 segments  | ..... <i>Quad mini</i>    |
| 4. | a | No legs present     | ..... <i>Podium minus</i> |
|    | b | Legs present        | ..... <i>Podium plus</i>  |

**Question 17.**

Organism A is

- A. *Podium plus*
- B. *Quad mini*
- C. *Tri grande*
- D. *Felix vert*

**Question 18.**

*Podium minus* and *Podium plus*

- A. Belong to the same species
- B. Belong to the same family
- C. Are able to mate and produce vigorous fertile offspring
- D. Belong to different genera

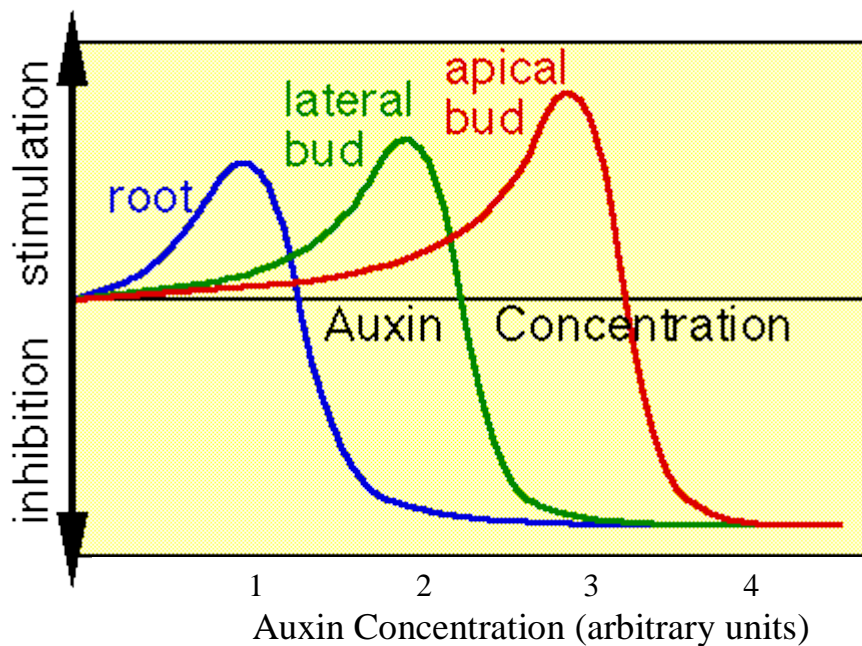
**Question 19.**

Chimpanzees live in large social groups. Animals living in such groups have

- A. greater competition for mates.
- B. reduced protection from predators.
- C. less chance of catching a contagious disease.
- D. less competition for food.

**Question 20.**

The figure below shows the response of roots, lateral buds and apical buds to different auxin concentrations.



An auxin concentration that would stimulate apical buds but would inhibit the lateral buds and the roots would be

- A. 1 arbitrary unit of auxin.
- B. 2 arbitrary units of auxin.
- C. 3 arbitrary units of auxin.
- D. 4 arbitrary units of auxin.

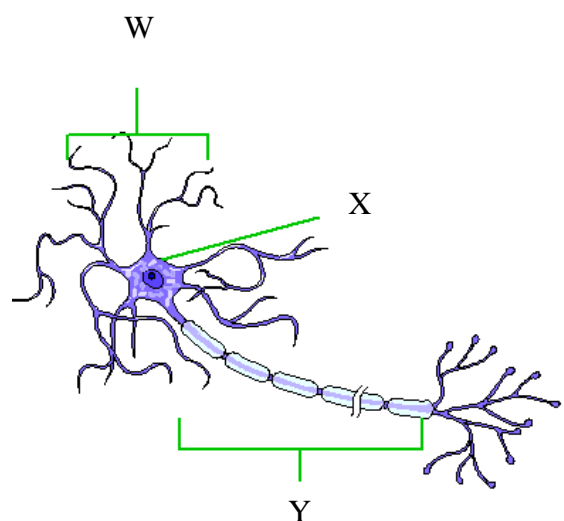
*Use the following information to answer Questions 21 and 22.*

*The figure below shows a neurone from an animal.*

**Question 21.**

In this neuron,

- A. W represents dendrites, X represents the cell body and Y represents an axon.
- B. X represents dendrites, W represents the cell body and Y represents an axon.
- C. Y represents dendrites, X represents the cell body and W represents an axon.
- D. W represents dendrites, Y represents the cell body and X represents an axon.



**Question 22.**

Neurotransmitters would be released

- A. by the cell body
- B. by the dendrites
- C. at the end of the axon.
- D. by the cell body, dendrites and axon

**Question 23.**

In an experiment, seeds from three different plant species were placed in Petri dishes (ten seeds per dish) with paper towelling and adequate water. The dishes were then stored at a range of temperature and light levels, and were left for ten days. The results are shown below.

Plant species	Environmental conditions	Number of seeds germinated after ten days (out of ten seeds)
I	5°C, dark	5
	5°C, light	1
	20°C, dark	10
	20°C, light	3
	80°C, dark*	0
	80°C, Light*	0
II	5°C, dark	0
	5°C, light	0
	20°C, dark	0
	20°C, light	0
	80°C, dark*	8
	80°C, Light*	9
III	5°C, dark	8
	5°C, light	7
	20°C, dark	0
	20°C, light	0
	80°C, dark*	0
	80°C, Light*	0

\*These seeds were heated at 80°C for 10 minutes and then incubated at 20°C.

From the results and your knowledge, it is reasonable to conclude that

- A. light is necessary for seeds to germinate.
- B. Seeds from species I and II would have hard seed coats.
- C. All seeds would eventually germinate.
- D. Seeds of species II would be suited to an Australian environment where bushfires often occur.



**Question 24.**

A fish living in a fresh water pool is influenced by biotic and abiotic factors.. Select the appropriate factors affecting such a fish.

**Biotic Factors**

- A. Dissolved oxygen
- B. pH
- C. decomposers
- D. photosynthetic algae

**Abiotic factors**

- photosynthetic algae
- temperature gradient
- mineral ions in solution
- decomposers

**Question 25.**

Camels living in the desert have evolved to survive on limited water. Camels that are dehydrated are able to raise their body temperatures by up to 6°C. The raising of their body temperature means that:

- A. the camel will lose less water as it does not need to sweat until a 6° higher temperature.
- B. The camel will have a higher rate of metabolism, therefore will produce more water by respiration.
- C. The rate of metabolism is decreased due to the higher temperature, therefore less water is lost as water is a product of respiration.
- D. The camel will produce more energy, keeping it alive until it can reach water.

**Questions 26 and 27 refer to the following information.**

Giant worms *Riftia pachyptila* live in the deepest part of the ocean. These worms contain bacteria in their tissues. The worms lack a digestive system and the bacteria provide them with organic compounds formed from hydrogen sulphide, carbon dioxide and oxygen that the worms absorb from their surroundings. Fish and crabs eat these tube worms.

**Question 26.**

The relationship between the worms and the bacteria is an example of

- A. mutualism
- B. collaboration
- C. parasitism
- D. predator-prey

**Question 27.**

In this ecosystem, the bacteria are acting as

- A. primary consumers
- B. secondary consumers
- C. producers
- D. decomposers

**Question 28.**

Not all the energy at one trophic level is passed on to the next trophic level because:

- A. there are fewer organisms at higher trophic levels.
- B. higher trophic levels exist only as carnivores.
- C. some energy is lost as heat at each trophic level so is not available to pass on to the next trophic level.
- D. the animals get bigger at each trophic level and cannot be sustained.

**Question 29.**

A student feeds her goldfish a half teaspoon of fish food daily. The average population of goldfish in the aquarium over 6 months is 42 fish. She decides to increase the food to one whole teaspoon of fish food daily. After a 6 month period the average population was 63 fish.

This data supports the statement that

- A. the size of the aquarium was a limiting factor.
- B. the amount of food was a limiting factor.
- C. the goldfish reproduced rapidly.
- D. if the student increases the food supply the population will continue to increase.

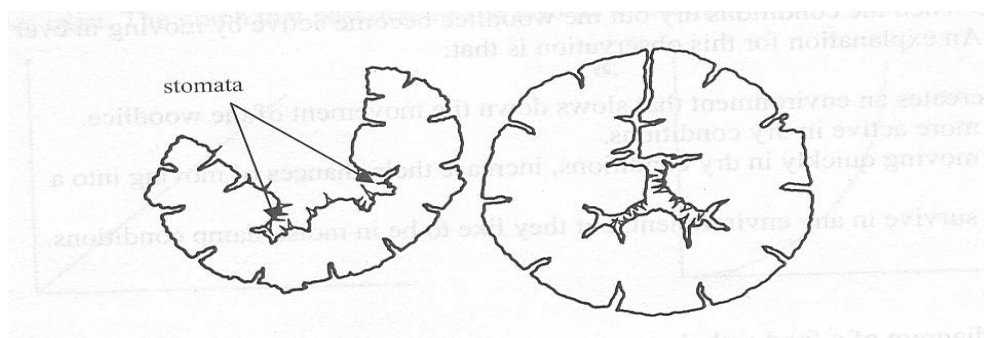
**Question 30.**

The short-beaked echidna, *Tachyglossus aculeatus*, is usually a diurnal animal, meaning that it is active during the day. When conditions become very hot it tends to become nocturnal. It is reasonable to include that this is

- A. a behavioural adaptation enabling the echidna to avoid the heat of the day.
- B. a behavioural adaptation allowing the echidna to cool itself in the cool of the evening.
- C. a structural adaptation so that the heat is not lost through the short beak of the echidna.
- D. a learned response enabling the echidna to keep warm at night.

**Question 31.**

Spinifex grass has leaves that can curl up as shown in the diagram below:

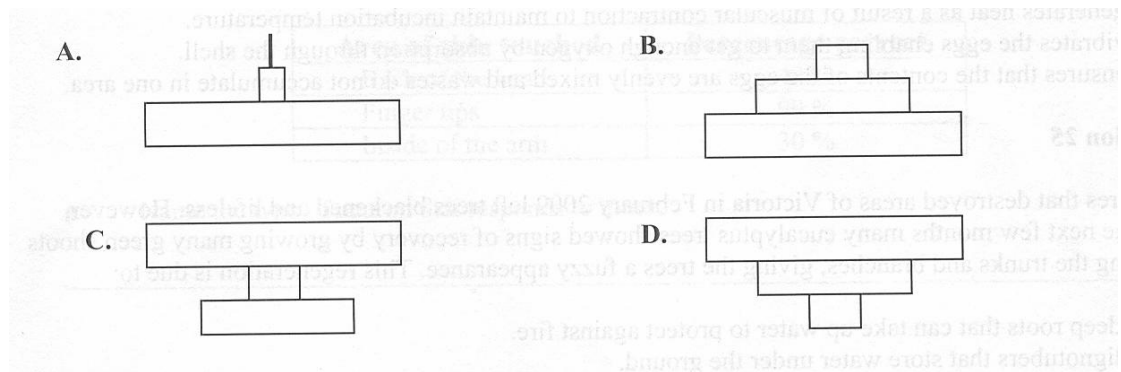


The procedure of curling up is designed to reduce

- A. conduction
- B. translocation
- C. transpiration
- D. heat loss

**Question 32.**

Select the diagram that shows the flow of energy through a community with three trophic levels.

**Question 33.**

An example of positive phototropism in plants is

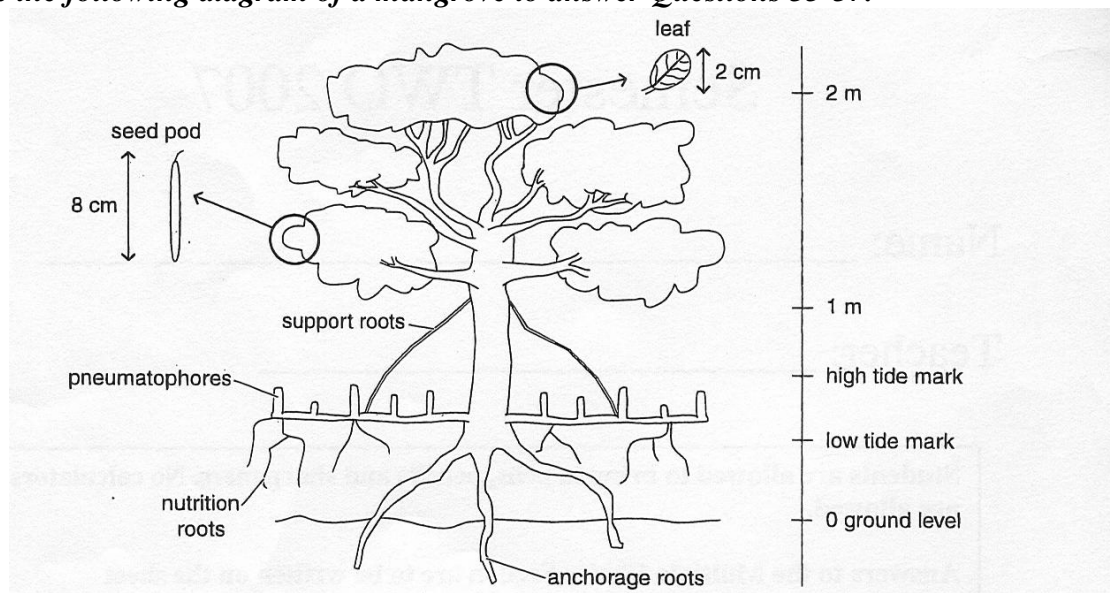
- A. following of the sun by sunflowers.
- B. growth of the shoot away from light.
- C. growth of the shoot towards the direction of light.
- D. flowering of plants due to the length of uninterrupted darkness.

**Question 34.**

Bushfires that destroyed areas of Victoria in February 2009 left trees blackened and lifeless. However, over the next few months, many eucalyptus trees showed signs of recovery by growing green shoots covering the trunks and branches, giving the trees a fuzzy appearance. This regeneration is due to

- A. deep roots that can take up water to protect against fire.
- B. lignotubers that store water under the ground.
- C. epicormic buds under the bark that survive the fire.
- D. seeds that are capable of regeneration after a fire.

Use the following diagram of a mangrove to answer Questions 35-37.



**Question 35.**

Pneumatophores assist in survival by gaining oxygen

- A. at all times.
- B. at high tide only
- C. at low tide only
- D. at night

**Question 36.**

Mangrove leaves are able to excrete salt. This ability is

- A. a physiological adaptation
- B. a behavioural adaptation
- C. an environmental response
- D. a structural adaptation

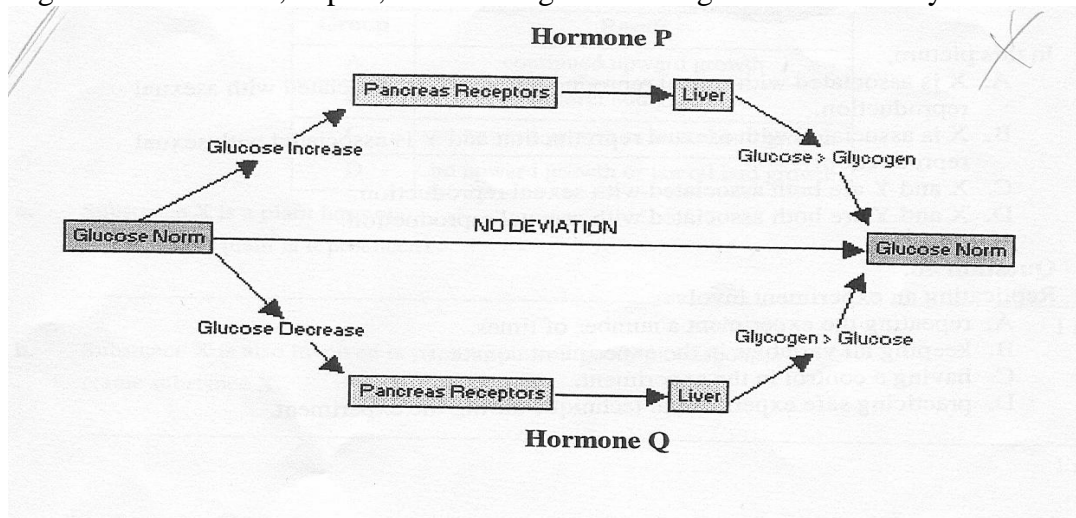
**Question 37.**

For the mangrove, an environmental condition that would be greater at high tide compared to low tide would be the availability of

- A. oxygen
- B. carbon dioxide
- C. water
- D. light

***Refer to the diagram below to answer Questions 38-39***

The diagram below shows, in part, how blood glucose is regulated in the body.



**Question 38.**

In this diagram,

- A. Hormone P is glucagon and Hormone Q is insulin.
- B. Hormone P is glycogen and Hormone Q is insulin.
- C. Hormone P is insulin and Hormone Q is glucagon.
- D. Hormone P is insulin and Hormone Q is glycogen.

**Question 39.**

In this diagram, glucose concentration is

- A. regulated by two positive feedback systems.
- B. regulated by two negative feedback systems.
- C. regulated by one negative feedback system and one positive feedback systems.
- D. not regulated by feedback systems.

**Question 40.**

Replicating an experiment involves

- A. repeating the experiment a number of times.
- B. keeping all variables in the experiment constant.
- C. having a control in the experiment.
- D. practising safe experimental techniques during the experiment.

**Question 41.**

The picture opposite shows a type of learning known as

- A. problem solving.
- B. conditioning.
- C. observational learning.
- D. imprinting.

**Question 42.**

The water lily shown in the picture is best described as

- A. a hydrophyte.
- B. a halophyte.
- C. a mesophyte.
- D. a xerophyte.

**Question 43.**

In the picture opposite,

- A. the dog on the left is displaying submissive behaviour while the dog on the right is displaying aggressive behaviour.
- B. the dog on the left is displaying aggressive behaviour while the dog on the right is displaying submissive behaviour.
- C. the dog on the left is displaying aggressive behaviour while the dog on the right is displaying territorial behaviour.
- D. the dog on the left is displaying territorial behaviour while the dog on the right is displaying aggressive behaviour.



**Question 44.**

In the 1930's, many areas of Queensland were covered in a prickly pear, a cactus that was introduced from South America. A moth, *Cactoblastis*, was introduced and was successful in eradicating the cactus. This is an example of

- A. chemical control.
- B. biological control.
- C. the successful use of a herbicide.
- D. mechanical control.

**Question 45.**

The plant hormone, ethylene, is involved in

- A. stomatal closure.
- B. cell elongation.
- C. fruit ripening.
- D. seed dormancy.

*Use the following diagram to answer Questions 46-48*

**Question 46.**

The diagram opposite illustrates the biological phenomenon of

- A. biomass
- B. a food web
- C. biological control
- D. bioaccumulation

**Question 47.**

The DDT shown in this diagram is

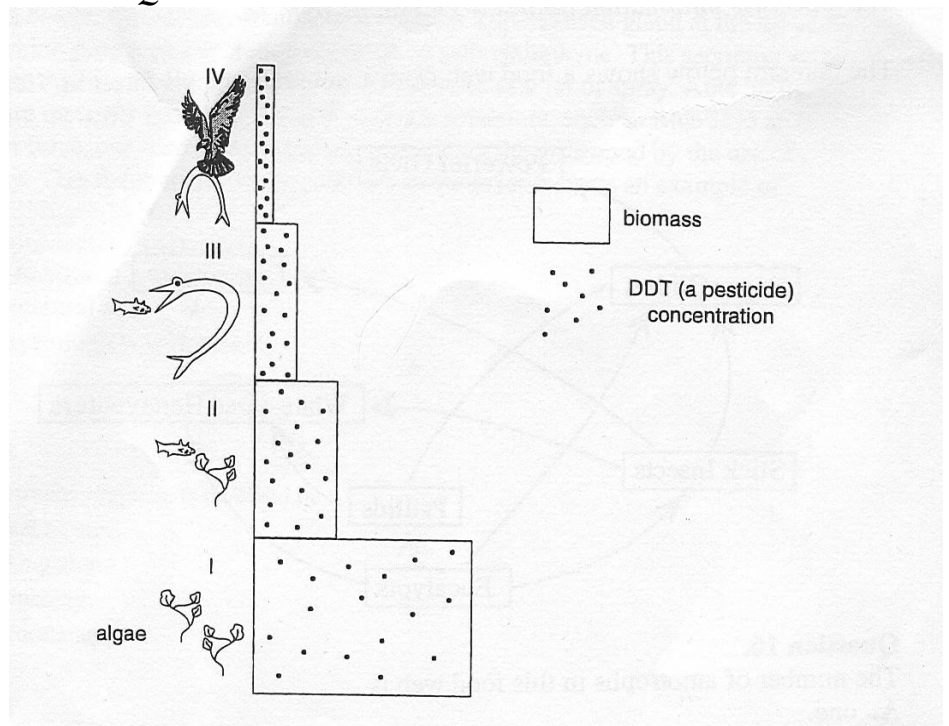
- A. biodegradable.
- B. readily excreted by all organisms.
- C. is produced as a by-product of respiration.

- D. would affect the health of fish eating birds more than the health of fish.

**Question 48.**

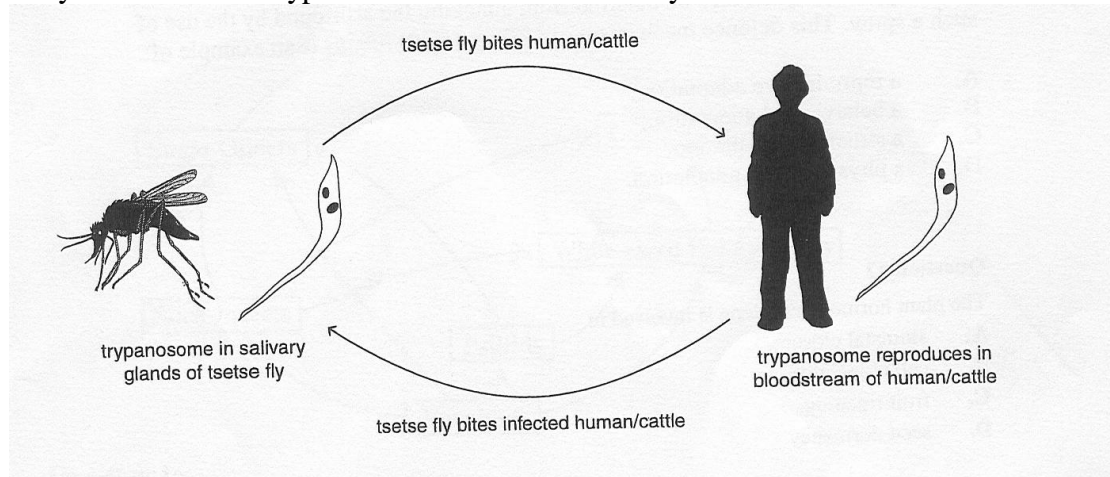
Using only the information provided in the diagram, organism III would best be described in terms of feeding as

- A. an omnivore.
- B. a third order consumer.
- C. a first order carnivore.
- D. an autotroph.



#### Question 49.

African sleeping sickness is caused by a single-celled organism called a trypanosome. Humans and cattle are affected by this disease which can result in short periods of fever, unresponsiveness and 'sleepiness'. Fifty thousand people die of this condition each year. The tsetse fly is a vector for trypanosomes. Below is a life cycle for this disease.

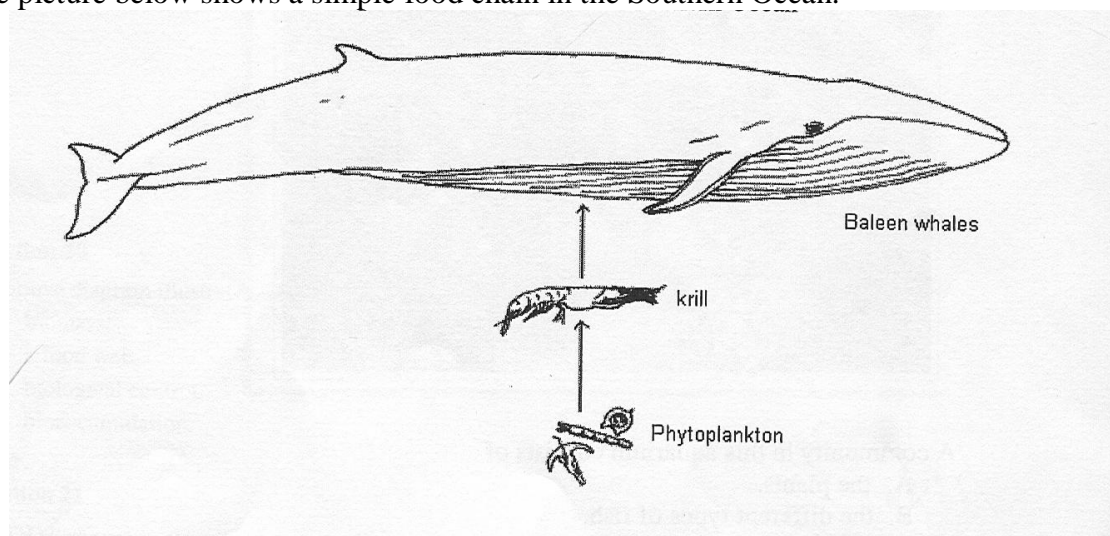


The relationship between the tsetse fly and humans is

- A. predator-prey.
- B. competitors.
- C. parasite-host.
- D. disease-host.

#### Question 50

The picture below shows a simple food chain in the Southern Ocean.



The greatest biomass in this food chain would be expected to be in the

- A. baleen whales.
- B. phytoplankton.
- C. krill.
- D. consumers.

## Section B:Short Answer Questions

*Answer All Questions in the spaces provided.*

### Question 1

The Laughing Kookaburra, shown opposite, lives in small family groups with a dominant mating pair maintaining the social order. The birds raise a wild chorus of ‘laughter’ as they settle down to roost for the night and again at dawn. They have been observed to swoop down and physically attack other birds.



- a. Name the type of behaviour demonstrated by the laughing chorus.

\_\_\_\_\_ (1 mark)

- b. State two advantages gained by kookaburras when displaying this behaviour.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_ (2 marks)

The northern quoll, *Dasyurus hallucatus*, a native marsupial, is being driven to extinction in many parts of northern Australia because it is eating highly toxic cane toads.

Quolls tend to eat large toads which kill them outright, rather than just making them sick, because of the amount of poison ingested. As a consequence, northern quolls never learn to avoid eating cane toads.

(Northern Quoll)



Ecologists in Australia have taken 62 young quolls and divided them into two groups. They presented one group with a very small dead cane toad that they had covered with a non-toxic but nausea-inducing chemical. The other group acted as a control. Both groups were then presented with a very small live cane toad and their behaviour observed.



- c. What results were the ecologists trying to achieve in this experiment?

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(1 mark)

The experimental group achieved the desired behaviour.

- d. Is the desired behaviour shown by the experimental group innate or learned? Explain your answer.

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(2 marks)

Scientists then returned the experimental group to the wild knowing that they would have a greater chance of survival.

- e. Why were the scientists confident that these quolls would have a greater chance of survival?

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(2 marks)

- f. Would this behaviour be passed down to the offspring of these experimental quolls? Explain your answer.

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(2 marks)

**TOTAL 10 MARKS**

## Question 2



*Lepus americanus*



*Lepus californicus*

The pictures above show two different species of hare found in North America. *Lepus americanus* changes its fur colour to white in winter.

- a. What type of environment would *Lepus americanus* be found in? Give two reasons for your answer.

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(2 marks)

- b. Name two structural adaptations shown by *Lepus californicus*.

1. \_\_\_\_\_
2. \_\_\_\_\_

(2 marks)

- c. Suggest how ONE of the adaptations you have described in **part b** gives this animal a survival advantage in its environment.

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(1 mark)

**TOTAL 5 MARKS**

### Question 3

Heavy metals, such as mercury and cadmium, are widely used in industry. However, they are highly toxic when they combine with water as they form soluble compounds that can be readily absorbed into the body. Once inside cells, they inhibit the action of certain enzymes. Methyl mercury is one such compound. An investigation of a freshwater lake was undertaken. The table below shows the concentration of methyl mercury in some organisms that make up a food chain in this lake.

Organism	Concentration of Methyl Mercury (mg/kg)	Organism
<i>Lepomis macrochirus</i>	0.071	
<i>Erythemis simplicicollis</i>	0.035	
<i>Micropterus salmoides</i>	0.427	
<i>Pomoxis annularis</i>	0.143	

- a. What does this data suggest about methyl mercury?

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(1 mark)

b. Draw the food chain represented by the organisms above.

c. Using the terms non-biodegradable and biomass, explain the distribution of methyl mercury in these organisms. (1 mark)

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(2 marks)

**TOTAL 4 MARKS**

#### Question 4

The owls of Australia belong to two separate families. An owl was found nesting between clumps of grass in pastureland in Queensland. A picture of the owl is shown below.

a. Use the key on the following page to identify the species of owl shown in the picture.

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(1 mark)



- 1a. Owls having a large heart-shaped face. Eyes dark brown. Middle claw of each foot possessing a comb-like structure used for preening. \_\_\_\_\_ 2
- 1b. Owls having a hawk-like face. Eyes ranging in colour from grey-green to yellow. Middle claw lacking a comb-like structure for preening. \_\_\_\_\_ 5
- 2a. Ground-dwelling owls with long legs that lack feathers. \_\_\_\_\_ *Tyto longimembris*
- 2b. Owls not ground-dwelling. Legs fully feathered. \_\_\_\_\_ 3
- 3a. Owls sooty-grey in colour. Found in dense rainforest and fern gullies. \_\_\_\_\_ *Tyto tenebricosa*
- 3b. Owls of a different colour. Habitat various. \_\_\_\_\_ 4
- 4a. Owls white with a thin covering of feathers on legs. \_\_\_\_\_ *Tyto alba*
- 4b. Owls ranging in colour from white to brown. Legs heavily feathered. \_\_\_\_\_ *Tyto novaehollandiae*
- 5a. Large owls, adults ranging in size from 600 to 660 mm. \_\_\_\_\_ *Ninox strenua*
- 5b. Smaller owls, adults less than 600 mm in length. \_\_\_\_\_ 6
- 6a. Owls with large white spots on wings. \_\_\_\_\_ 7
- 6b. Owls lacking large white spots on wings. \_\_\_\_\_ *Ninox rufa*
- 7a. Owls with grey-green eyes. \_\_\_\_\_ *Ninox novaeseelandiae*
- 7b. Owls with bright yellow eyes. \_\_\_\_\_ *Ninox connivens*

b. From the information given in the key, answer the following.

- i. How many species of owls are there in Australia? \_\_\_\_\_ (1 mark)
- ii. How many genera of owls are there in Australia? \_\_\_\_\_ (1 mark)
- iii. Name two structural features that are used to separate the genera of Australian owls.

Structure 1. \_\_\_\_\_

\_\_\_\_\_

Structure 2. \_\_\_\_\_

\_\_\_\_\_

(2 marks)

c. Do *Tyto* and *Ninox* belong to the same family? Justify your answer.

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(2 marks)

d. From the information given in the key, complete the following table. If there is insufficient information in the key, indicate this by placing an 'X' in the box.

<i>Species</i>	<b>Eye Colour</b>	<b>Shape of Face</b>
<i>Tyto tenebricosa</i>		
<i>Ninox rufa</i>		

(2 marks)

e. The powerful owl, *Ninox strenua*, nests in large hollows of eucalypt trees. Large hollows only form in trees that are over 150 years old. Describe a human activity that is likely to have a major impact on the breeding of powerful owls.

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(1 mark)

**Total 10 marks**

### Question 5

A biology student wanted to test the hypothesis that chilling tulip bulbs to temperatures below 5 °C was necessary for them to produce flowers in spring. In her experiment, she exposed tulip bulbs to a range of temperatures and then measured the percentage that produced flowers in the following spring. Her results are shown in the table below.

Temperature that bulbs were exposed to (°C)	Number of bulbs that produced flowers (%)
-2	4
0	40
2	44
4	66
6	0
8	0

a. According to the data shown in the table above, is the student's hypothesis supported? Justify your answer.

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(2 marks)

b. Is a chilling temperature of 0 °C the best temperature to expose tulip bulbs to if you wish them to flower? Justify your answer by referring to the data in the table.

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(2 marks)

c. In this experiment, what external stimulus are the tulip bulbs responding to?

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(1 mark)

**Total = 5 marks**

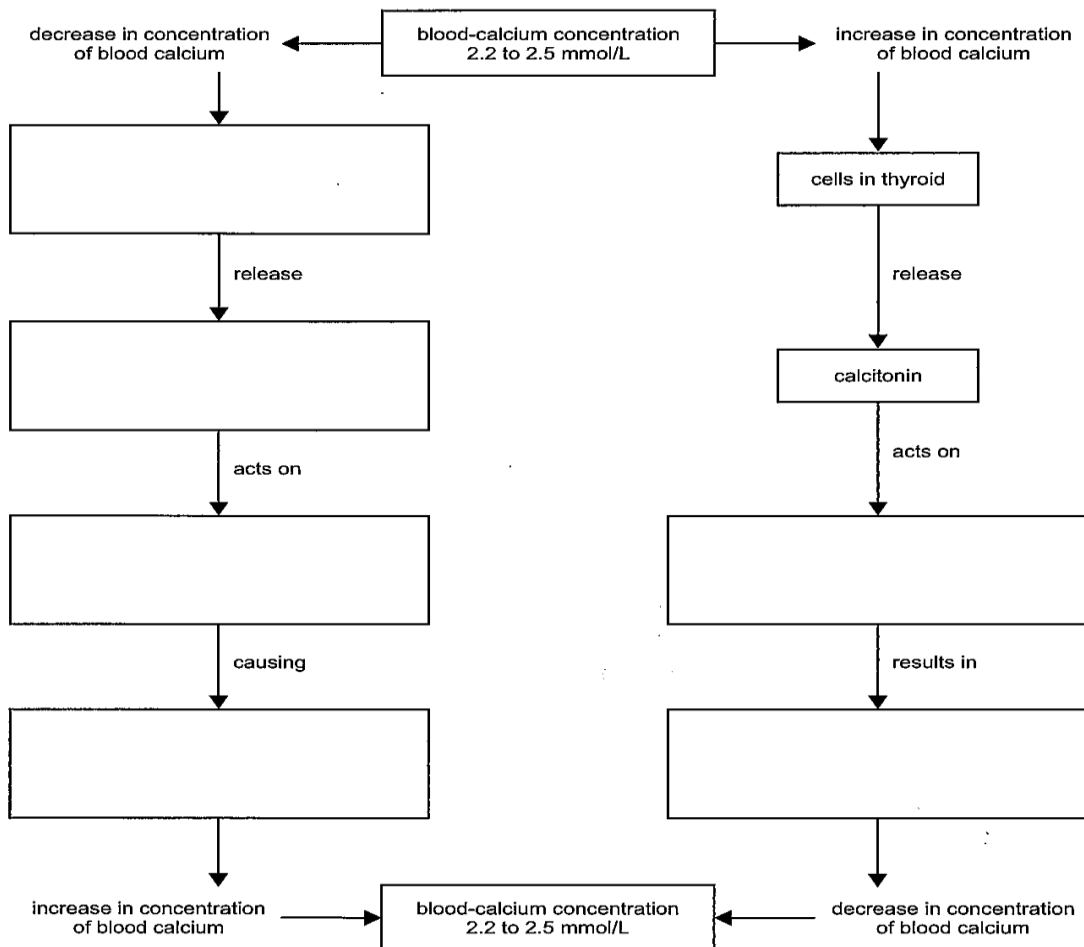
### Question 6.

The table below shows some of the pathways that the body uses to regulate calcium levels.

- a. Read the information given below and complete the flow chart by filling in the six empty boxes. (3 marks)

Human blood-calcium concentrations are under homeostatic control. When the concentration of calcium in the blood begins to fall the parathyroid gland releases parathyroid hormone. This hormone stimulates bone cells called osteoclasts to break down bone and release calcium into the blood.

When the concentration of calcium rises in the blood, specialised cells associated with the thyroid gland release the hormone calcitonin. Calcitonin acts on bone and increases the amount of calcium that is deposited into bone.



- b. What is the general name given to structures that detect changes in blood calcium concentration?

\_\_\_\_\_ (1 mark)

- c. Give the term that describes the maintenance of a constant internal environment.

\_\_\_\_\_ (1 mark)

**Total 5 marks**



### Question 7

a. The table below lists several plant and animal hormones and the effect that each can bring about. Also included is a column indicating the organ or plant part that secretes the hormone. Fill in the clear blanks in the table. An example has been included.

Hormone	Effect	Organ or Plant Part that secretes hormone
<i>Oestrogen (example)</i>	<i>Stimulates sexual development in females (example)</i>	<i>Ovary (example)</i>
Ethylene		
Cytokinin		
	Promotes dormancy in plants	
	Promotes muscle development	
Adrenalin		
		The tip of a growing shoot

(5 marks)

**Total 5 marks**

### Question 8

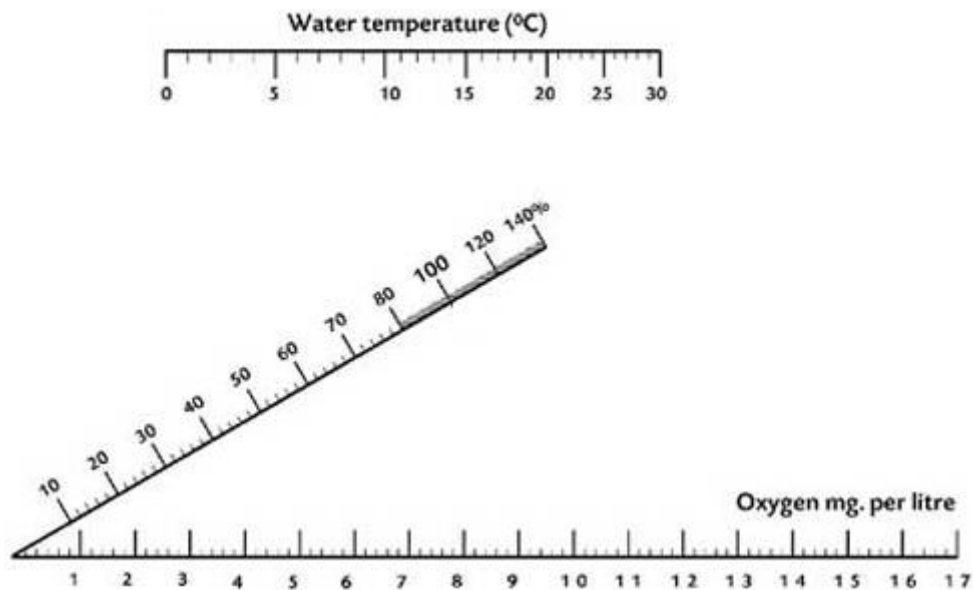
The Murray Freshwater Crayfish, shown opposite, lives in streams containing abundant debris and vegetation. During the warmer months, it burrows underground. The waters where they live need to be well oxygenated and must have a saturation level of at least 75%.



- a. Why do crayfish require oxygen to survive? In your answer include a chemical equation.

(2 marks)

The diagram below can be used to calculate the percentage saturation of oxygen. A student investigated an area where crayfish might live and measured the oxygen concentration and temperature of the water. She found the oxygen concentration to be 7 mg/litre and the temperature to be 13 °C.



- b. Using the diagram and the measurements taken by the student, explain whether the oxygen levels are suitable for crayfish to survive.

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(2 marks)

At another site, a student found a large number of dead crayfish which had been healthy a few days earlier. She measured the oxygen level and found it to be less than 2 mg/litre.

- c. What might have caused the sudden drop in the oxygen levels of the water? Justify your answer.

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(2 marks)

**Total 6 marks**

**END OF TASK**