
Student Number

Barker College

Biology

2019 YEAR 11 PRELIMINARY EXAMINATION

ANSWER SHEET

Staff Involved:

- TKB*
- VBE
- KJH
- SLC
- RYF
- THC

AM FRIDAY 13TH SEPTEMBER
140 COPIES

Part A - Multiple Choice
Choose the best response and fill in the response oval completely

Start Here →

1	A ○	B ○	C ○	D ○		11	A ○	B ○	C ○	D ○
2	A ○	B ○	C ○	D ○		12	A ○	B ○	C ○	D ○
3	A ○	B ○	C ○	D ○		13	A ○	B ○	C ○	D ○
4	A ○	B ○	C ○	D ○		14	A ○	B ○	C ○	D ○
5	A ○	B ○	C ○	D ○		15	A ○	B ○	C ○	D ○
6	A ○	B ○	C ○	D ○						
7	A ○	B ○	C ○	D ○						
8	A ○	B ○	C ○	D ○						
9	A ○	B ○	C ○	D ○						
10	A ○	B ○	C ○	D ○						

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General Instructions:

- Reading time - 5 minutes
- Working time - 2 hours
- Write using black pen
- Draw diagrams using pencil
- NESA approved calculators may be used

Total marks: 90

This paper has two parts, Part A and Part B

Part A - 15 marks (pages 2 - 8)

- Attempt Questions 1 - 15
- Allow about 20 minutes for this part

Part B - 75 marks (pages 9 - 26)

- Attempt Questions 16 - 27
- Allow about 1 hour and 40 minutes for this part

Part A

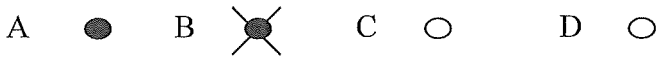
15 marks
Attempt Questions 1 – 15
Allow 20 minutes for this part

Use the multiple-choice answer sheet for Questions 1 – 15
Select the alternative A, B, C or D that best answers the question. Fill in the response oval completely.

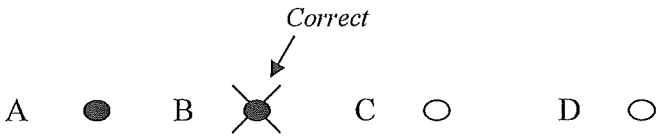
Sample 2 + 4 = A 2 B 6 C 8 D 9

A ○ B ○ C ○ D ○

If you think you have made a mistake, put a cross through the incorrect answer and fill in the new answer.



If you change your mind and have crossed out what you consider to be the correct answer, then indicate this by writing the word *correct* and drawing an arrow as follows.



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1. To determine if a eukaryotic organism is autotrophic or heterotrophic you could:

   A. observe the locomotion of the organism.

   B. determine the type of organelles within the cells.

   C. determine the type of reproduction of the organism.

   D. observe the cells to identify the presence of a cell wall.

2. When using a light microscope, how can magnification of the structure being observed be increased?

   A. variation in light intensity

   B. altering the stage position

   C. changing the objective lens power

   D. adjusting the iris diaphragm setting

3. A cross section of a leaf from a terrestrial plant reveals many large spaces between the cells in the mesophyll. How are these spaces important?

   A. They ensure that the leaf is turgid at all times

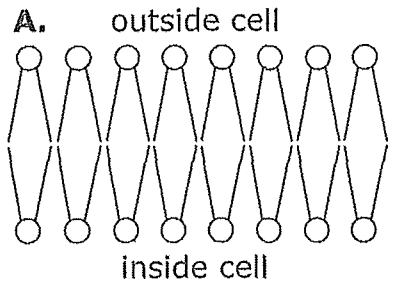
   B. They provide an outlet for excess water from the plant

   C. They allow for transport of food substances to other parts of the plant

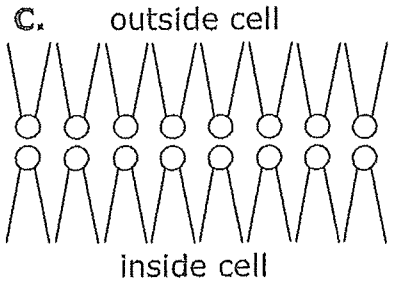
   D. They allow for the rapid diffusion of gases between the leaf and the outside air

4. Which of the following diagrams best represents the arrangement of phospholipid molecules in a cell membrane?

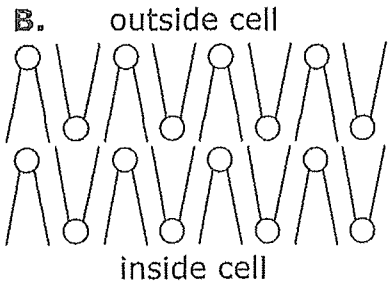
A.



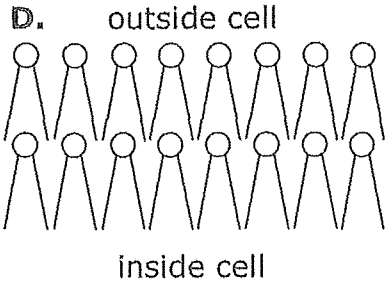
C.



B.



D.



5. Lettuce seeds were exposed to flashes of light of two wavelengths, red (R) and far red (FR). The percentage of seeds germinating after each treatment was measured. The data is shown in the table.

Light exposure	Germination %
None	9
Red	98
Red + FR	54
Red + FR + Red	100
Red + FR + Red + FR	43
Red + FR + Red + FR + Red	99
Red + FR + Red + FR + Red + FR	54
Red + FR + Red + FR + Red + FR + Red	98

What possible conclusion can you make from this data about the germination of lettuce seeds?

A. They require far red light

B. They require both red and far red light

C. It is influenced by whether the last flash is red or far red light

D. It requires equal amounts of red and far red light to get maximum germination

6. Which of the following would be the two most important abiotic factors determining the abundance and distribution of Australian organisms?

A. Predators and food source

B. Temperature and rainfall

C. Humidity and soil fertility

D. Water availability and introduced species

7. What is the best definition of a selection pressure?

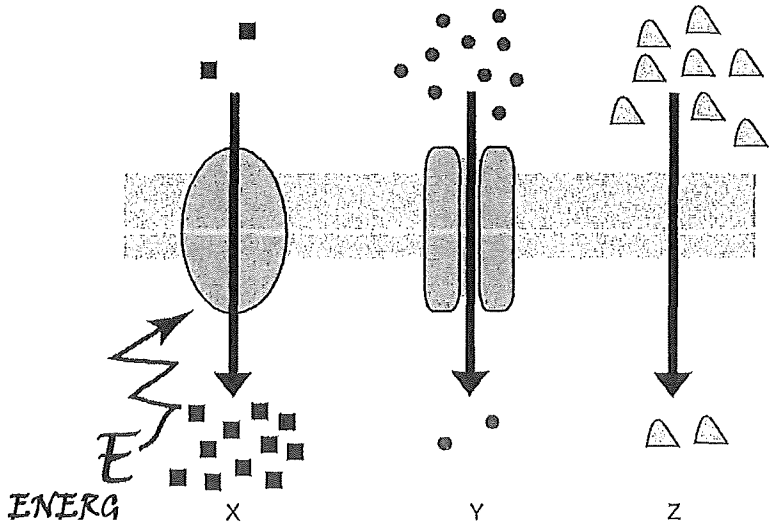
A. agents that impact the survival rates of organisms

B. the living and non-living surroundings

C. the chemical and physical factors of the surroundings

D. the abundance, diversity and distribution of species

8. Three types of movement across a plasma membrane are shown at X, Y and Z.



What is the correct description for the three types of movements?

	X	Y	Z
A.	active transport	diffusion	facilitated diffusion
B.	active transport	facilitated diffusion	diffusion
C.	facilitated diffusion	active transport	diffusion
D.	diffusion	active transport	facilitated diffusion

9. Where in the body is blood flowing when the concentration of glucose and amino acids increases?

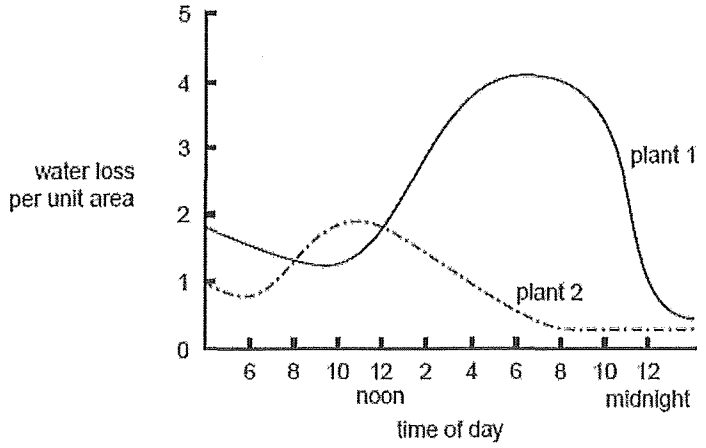
A. lungs

B. kidneys

C. brain

D. intestines

10. The amount of water lost per unit area from the leaf surface of two different plants was measured. Both plants were grown in the same conditions. The results are shown in the graph.



What can you conclude from the information given?

A. Plant 2 will be more likely to survive in a dry environment than plant 1

B. At 12 noon, plant 1 has a greater water loss per unit area than plant 2

C. At 10am, the average number of stomates open will be greater in plant 1 than plant 2

D. At 5pm, the rate of photosynthesis will be greater in plant 2 than plant 1

11. Coral polyps often contain algae living within their tissues, which contribute to their spectacular colours. The algae generally do not survive outside the polyp and the coral grows more slowly if the algae are not present. This association could be best described as:

A. competition

B. commensalism

C. mutualism

D. parasitism

12. Fossils of crocodiles very similar to those found today are found in rocks 80 million years old. What is the best explanation for why they exist virtually unchanged?

A. They live for so long that natural selection can't act on them

B. They are perfectly adapted and don't need to change

C. Their habitat has not changed appreciably

D. They have stopped evolving

13. In a forest five species of insect-eating birds are found. All of these species are able to survive. One reason why they might all be able to survive is because they:

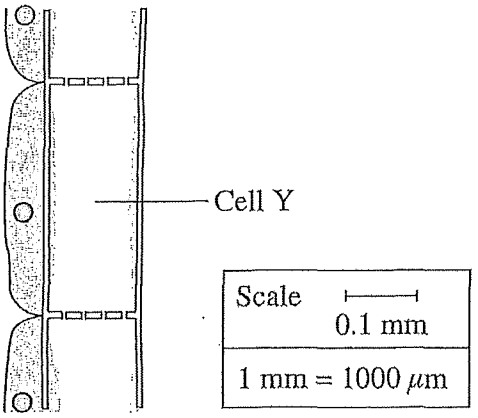
A. eat in different parts of the forest

B. eat the same type of insect

C. have their populations kept in check by predators

D. feed off each other.

Refer to the diagram of plant tissue below to answer Questions 14 and 15.



14. What is the most suitable title for this diagram?

A. A section of xylem tissue

B. A section of phloem tissue

C. A section of venous tissue

D. A section of xylem and phloem tissue

15. What is the width of cell Y?

A. 3 mm

B. 13 mm

C. 130 um

D. 180 um

End of Part A

Student Number

Part B – 75 marks
Attempt Questions 16 – 27
Allow about 1 hour and 40 minutes for this part
Answer the questions in the spaces provided.

Question 16 (4 marks)

A student used a light microscope to observe four different cells (A, B, C and D).
The observations are summarised in the table below.

Cell	Unicellular or part of multicellular organism	Nucleus	Cell wall	Approximate length (μm)
A	multicellular	present	present	200
B	unicellular	absent	present	5
C	multicellular	present	absent	30
D	unicellular	present	absent	100

(a) Which of the cells is most likely a prokaryote? Explain your reasoning. **2**

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(b) Which of the cells could be from a plant? Explain your reasoning. **2**

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Student Number

Question 17 (16 marks)

The Kaibab Plateau is on the edge of the Grand Canyon. Before 1905, the deer population on the Kaibab Plateau was estimated to be approximately 4000. The maximum number of deer that can live in the plateau was then estimated to be about 30000 deer. In 1906, the Grand Canyon National Game Preserve was created to protect the deer.

Unfortunately, by this time, the forest area had already been overgrazed by sheep, cattle and horses. Most of the tall grasses eaten by deer had been eliminated.

A number of **control mechanisms** were taken to manage the deer population, including:

A. All deer hunting was banned from 1905
B. Between 1907 and 1930 the hunting of predators was permitted and 16 mountain lions, 20 wolves, 7388 coyotes and more than 500 bobcats were killed.
C. Hunting deer was reopened in 1923 as the deer population was getting out of control and the deer were on the verge of starvation.
D. In 1934 the law was changed to limit the number of deer killed per year.

The table below shows the deer population for selected years from 1905 until 1939.

Time (Year)	Deer population (1000s)
1905	4
1910	9
1915	25
1920	65
1924	100
1927	90
1930	60
1934	30
1936	25
1939	23

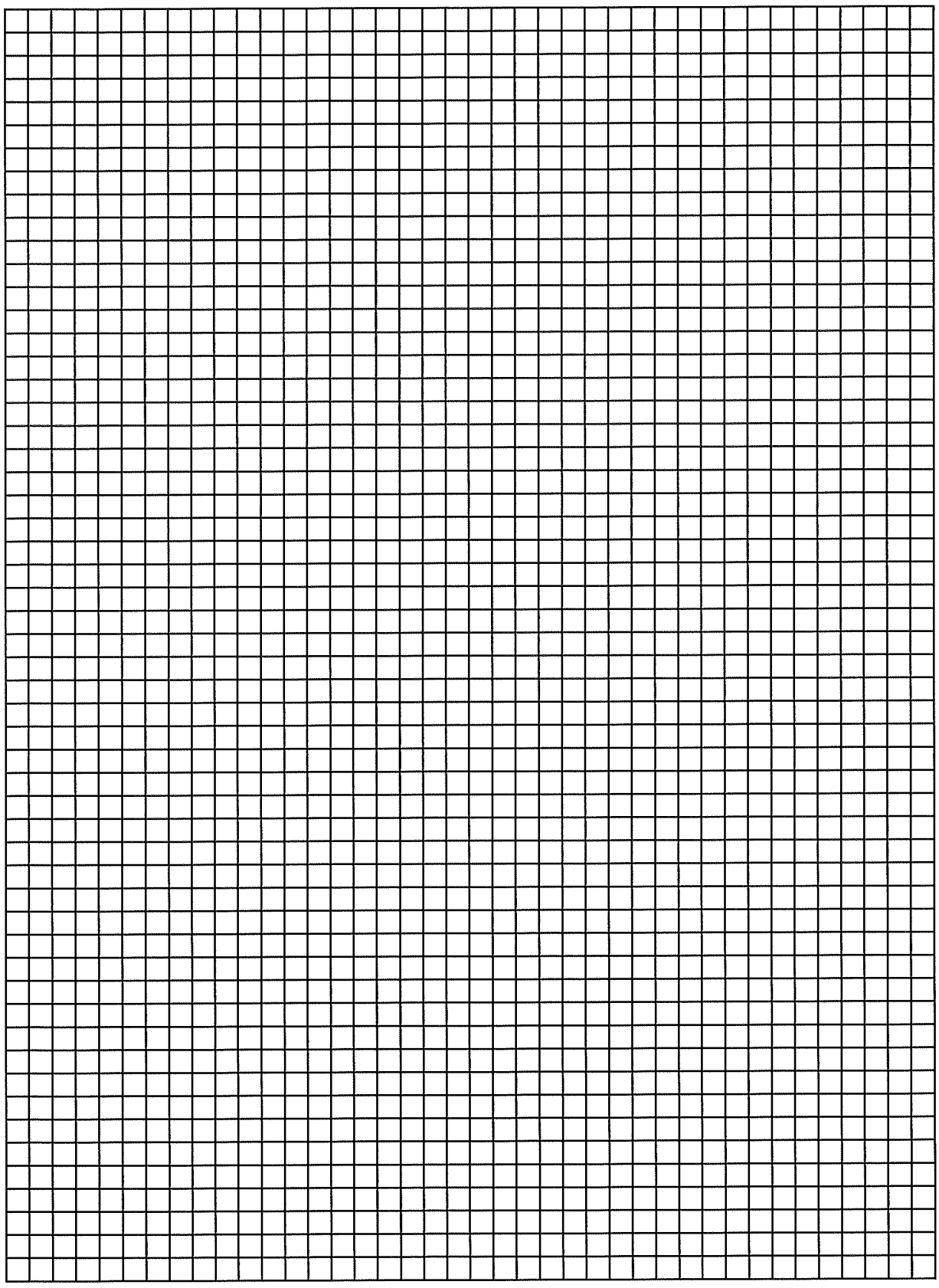
(a) Graph the deer population data on the next page. **5**

(b) **Annotate the graph with the control mechanisms used. (Use the letters A, B and C as in the stimulus above).** **3**

Question 17 continues on page 11

Question 17 (continued)

Student Number



Question 17 continues on page 12

(c) Two methods were used to protect the deer population. Discuss the success of TWO control methods to protect the deer population. Use the data from the graph to support your response. **3**

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(d) Explain why the deer population declined in 1925 despite the killing of predators. **2**

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(e) Predict what might have happened to the deer population without human intervention. Explain your response. **3**

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End of Question 17

Student Number

Question 18 (6 marks)

Amoeba are single-celled aquatic organisms. Amoeba obtained from an estuary are to be used in a study where amoeba will be added to three aquatic environments: marine, estuarine and freshwater. An estuary is a body of water usually found where rivers meet the sea. The salt concentration of each environment is shown below.

Environment	Marine	Estuarine	Freshwater
Salt concentration (mg/L)	3000	2500	18

Suggest what will happen to the amoeba when they are introduced to each environment. Justify each suggestion. **6**

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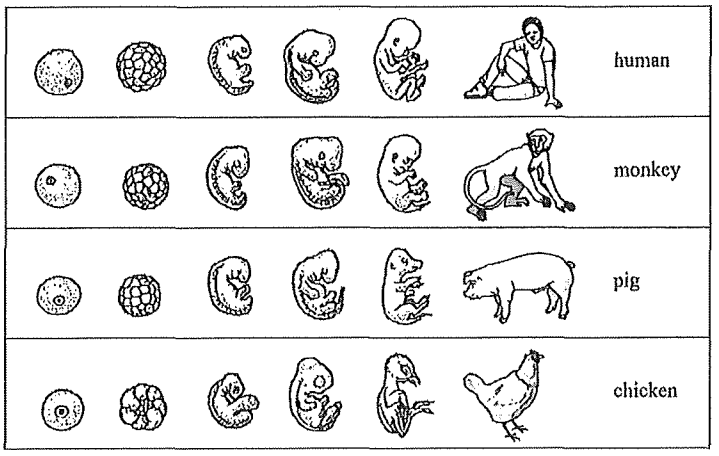
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Student Number

Question 19 (2 marks)

Study the diagram below, which illustrates the stages of embryological development for different kinds of organisms.



Explain how comparative embryology is used to support the theory of evolution.
Refer to the diagram in your response. **2**

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Student Number

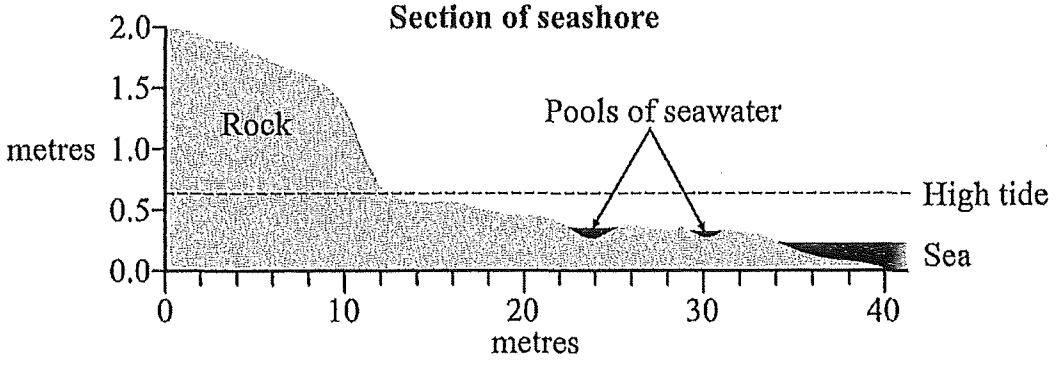
Question 20 (8 marks)

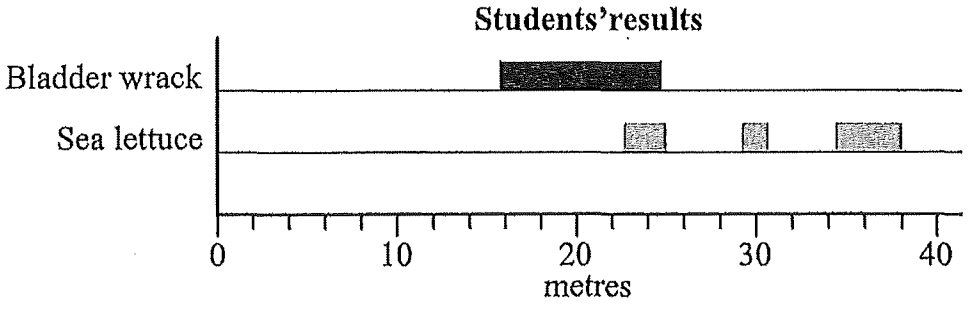
At the seashore, the tide comes in and goes out twice a day. Some students investigated whether two different species of seaweed – bladder wrack and sea lettuce – could only live at certain positions on a rocky shore.

The students:

1. Placed a 50 metre tape measure on the rocks at right angles to the sea.
2. Placed a 1m x 1m quadrat next to the tape measure.
3. Recorded whether each species was present or not.
4. Repeated steps 2 and 3 every metre along the transect.

The section of the seashore and the results are shown below.





(a) The students placed the quadrat at regular intervals along the transect line rather than placing the quadrat at random positions anywhere on the rocky shore. Explain why they did this. **2**

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Question 20 continues on page 16

Student Number

Question 20 (continued)

(b) Analyse the data to draw a conclusion about the distribution of bladder wrack and sea lettuce. Use the data in your response. **3**

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(c) How could the students have improved their investigation? **1**

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(d) The bladder wrack has many air bladders to help it float upwards when the sea covers it at high tide. Propose and justify a hypothesis to explain how this helps the bladder wrack survive in this environment **2**

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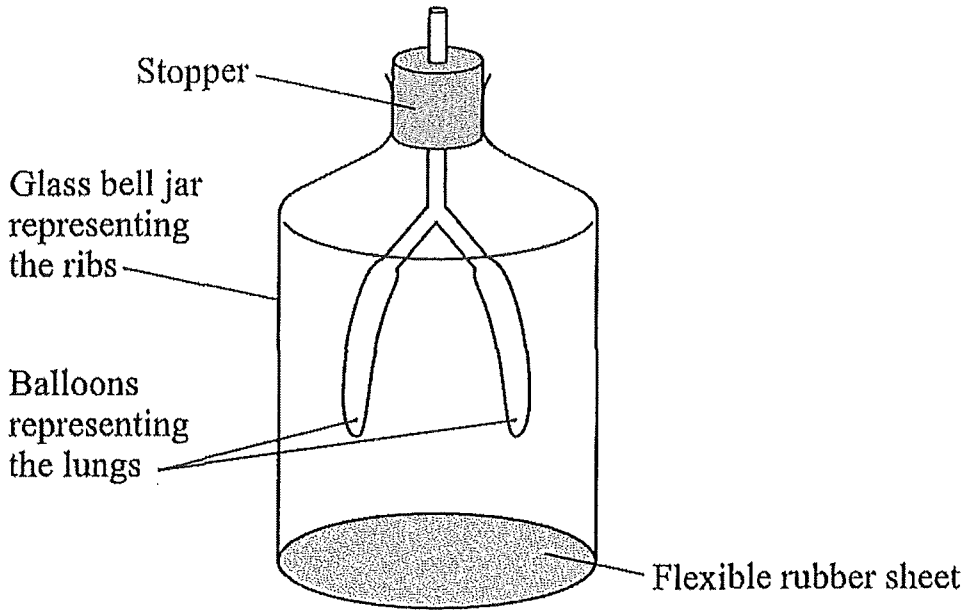
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End of Question 20

Student Number

Question 21 (9 marks)

The diagram below shows a model representing the human respiratory system. The different parts of the model represent different parts of the system.



(a) Which part of the human respiratory system does the flexible rubber sheet represent? **1**

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(b) Explain why the balloons inflate when the flexible rubber sheet is pulled down. **2**

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Question 21 continues on page 18

Question 21 (continued)

Student Number

(c) In the human body, during breathing, oxygen moves into the bloodstream. Name the structures involved in moving oxygen into the bloodstream and explain how these structures assist in the process of gas exchange. **4**

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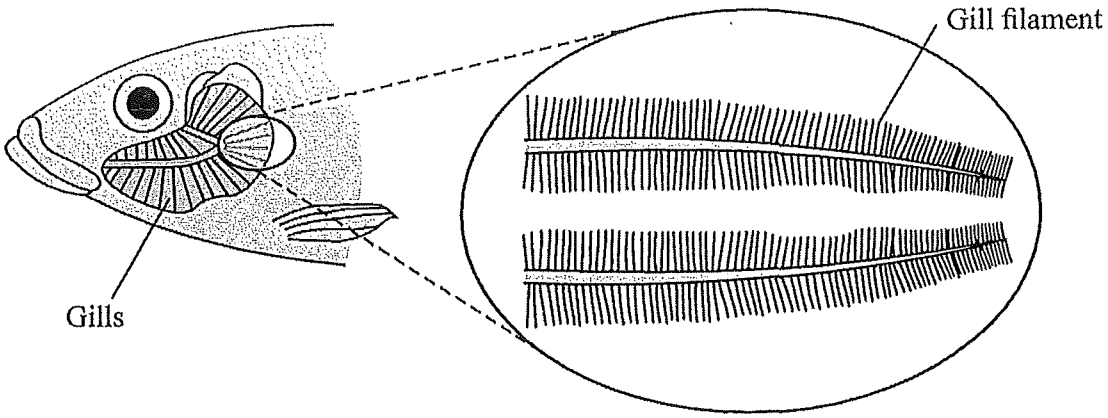
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(d) Fish absorb oxygen from the water through the gills.
The diagram below shows a fish head and gills.



Explain ONE way in which gills are adapted for rapid absorption of oxygen. **2**

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End of Question 21

Student Number

Question 22 (4 marks)

Four species of bird were studied in their natural environments. The table below records each of their food preferences, habitat and requirements for shelter.

Species	Food preferences	Habitat	Shelter
1	Reptiles, insects, crayfish, rodents and young birds	Open forest	Hollow tree trunk
2	Insects, berries, other fruits and small birds	Open forest	Upper branches of tall trees
3	Small insects	Heath lands	Nest constructed of dried grasses in low bushes
4	Insects, spiders, centipedes, frogs, mice and small lizards	Open forest	Nest of sticks in a forked tree branch

(a) Which TWO species would compete most with each other? Justify your answer by referring to the information in the table. **2**

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(b) Describe the niche of Species 4. **2**

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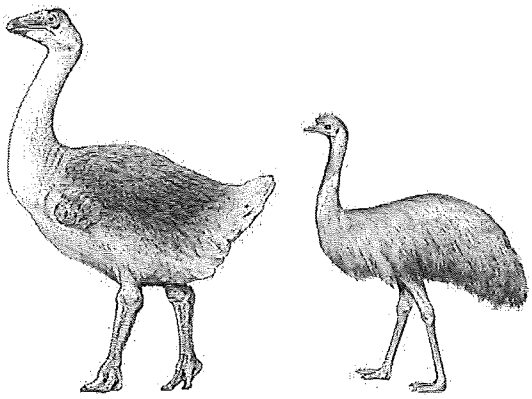
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Student Number

Question 23 (4 marks)

Genyornis newtoni was a large, flightless bird that lived in Australia. They stood over 2 metres tall and were fussy eaters, preferring soft, rainforest-like leaves with high nutritional value. The emu lived in Australia at the same time as *Genyornis*. The emu is a smaller bird with a diet consisiting of leaves, fruits, nuts and grasses.
About 45000 years ago, *Genyornis* became extinct while the emu did not. One theory for their extinction suggests that aboriginals played a role.



Explain the role that aboriginals may have played in the loss of these large birds from the Australian continent. **4**

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Student Number

Question 24 (3 marks)

The table below contains the names of six structures found in a plant cell. Below the table a number of cellular functions are given.

Complete the table by matching the letter of a function to the appropriate cellular structure. You are not required to use every function given. **3**

Cellular structure in the plant cell	*Matching function choose one from (A-H)*
Golgi apparatus	
mitochondria	
chloroplast	
lysosome	
vacuole	
cell membrane	

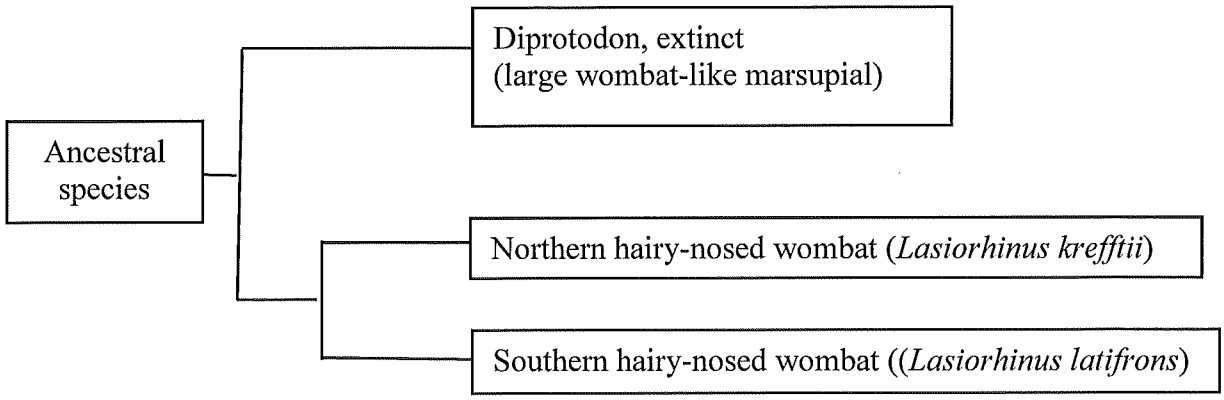
Functions of various cellular structures of the plant cell

A. Site where ATP is generated
B. Digestion of macromolecules
C. Site of protein synthesis
D. Proteins modified and packaged for transport
E. Selective barrier that limits movement into or out of cell
F. Solar energy is converted to chemical energy
G. Contains DNA, a template for RNA synthesis
H. Storage of wastes and other materials

Student Number

Question 25 (8 marks)

Study the evolutionary tree below, which shows examples of extinct and present day Australian fauna.



Use the theory of natural selection to explain the evolution of the two different species of wombat in the diagram. Include the following in your response: **8**

- Natural variation
- Different environmental pressures
- Adaptations to different environments

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Question 25 continues on page 23 (more lines for answer)

Student Number

Question 25 (continued)

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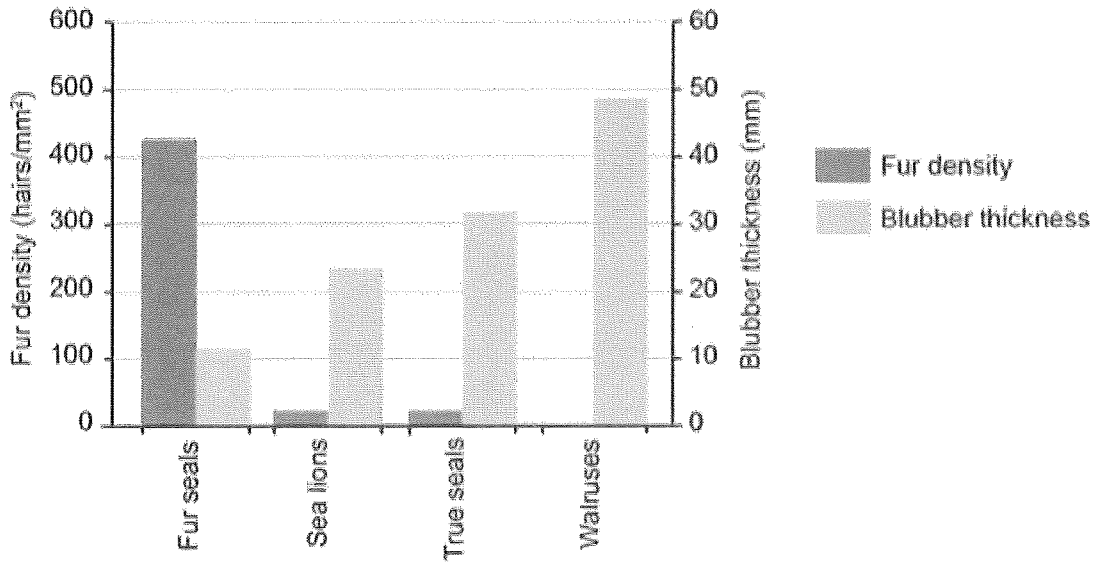
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End of Question 25

Student Number

Question 26 (6 marks)

The figure below shows the mean fur density and mean blubber (fat) thickness for four groups of marine mammals.



(a) Describe the relationship between mean fur density and mean blubber thickness in these marine mammals. Use data from the figure above to support your answer. **2**

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(b) Define the term 'adaptation'. **1**

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Question 26 continues on page 25

Student Number

Question 26 (continued)

(c) Identify whether blubber is a structural, physiological or behaviour adaptation for these animals and explain how it assists the survival of mammals in cold water. **3**

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End of Question 26

Student Number

Question 27 (5 marks)

(a) Write the word equation for photosynthesis. **2**

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(b) Explain the processes involved in moving the products of photosynthesis from the leaves to the rest of the plant. **3**

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End of Paper