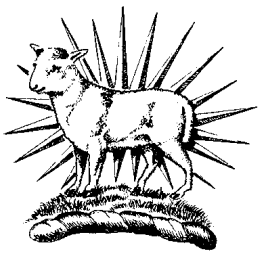
SURNAME _____ FIRST NAME _____ SCHOOL _____

Merchant Taylors' School



13+ Science Entrance Examination

Specimen Paper

BIOLOGY EXAMINATION

Time Allowed: 20 minutes Total Marks: 25

Instructions:

1. **The Science paper is divided into three sections (Biology, Chemistry and Physics). The time for the Science paper is 1 hour. You should spend no more than 20 minutes on each section. You will be told when to start the next section.**
2. Write your surname, first name and school at the top of the page.
3. Attempt all the questions.

1.

	Aerobic respiration	**Anaerobic respiration in humans**
Substrate(s)	Glucose Oxygen	_____
Products	_____ _____ ATP	Lactic acid ATP
Amount of energy released	High	_____

(a) Complete the table above.

(4)

(b) Explain why a runner must respire anaerobically after a while.

…….....

…….....

…….....

(1)

(c) Explain what happens during anaerobic respiration.

…….....

…….....

…….....

(1)

(d) Why does the body need to remove lactic acid?

……...

……...

(1)

(e) Which organ in the body is used to excrete carbon dioxide?

…….....

(1)

(Total 8 marks)

2. Read the following passage and answer the questions below.

The energy we receive in our food comes ultimately from the sun. This energy is captured in a chemical form that is useful to plants, in a process that occurs inside plant cells. Subsequently, we may eat the plant itself or eat animals that have eaten the plants and in this way the chemicals containing the trapped solar energy end up being used by our body cells. This passage of materials and energy from one organism to another and another is called a food chain. In a natural ecosystem, such as a pond or wood, there will be many links between numerous different food chains, to create a food web.

(a) What is the name of the process in which the sun's energy is captured in a chemical form?

…….....

(1)

(b) What is the name of the plant cell organelles in which this process occurs?

…….....

(1)

(c) What is the name of the useful substance created in the process that contains the trapped energy?

…….....

(1)

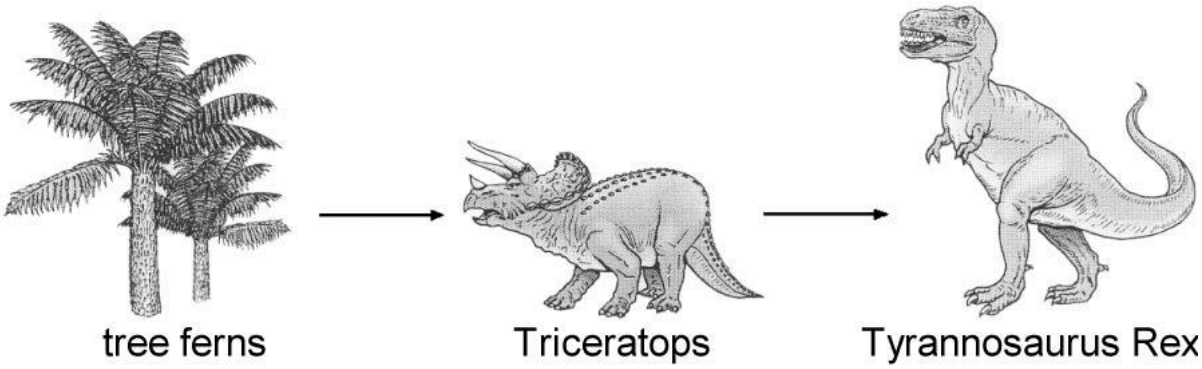
(d) What waste substance is produced by this process?

……

(1)

(Total 4 marks)

3. The drawing shows a food chain including plants called tree ferns and two dinosaurs. They lived on Earth millions of years ago.



(a) The list below shows words that describe living things in a food chain:

herbivore **predator** **prey** **producer**

(i) Which word in the list above describes tree ferns?

.....

(1)

(ii) From the list above, give **two** words that can describe *Triceratops*.

……....

(1)

(b) Some scientists think a large rock from space hit the Earth about 65 million years ago. A thick layer of dust stayed in the air for a long time and blocked out the sunlight. This would cause a decrease in the number of tree ferns.

What effect would this have on *Triceratops*? Explain your answer.

.....

.....

(2)

(c) *Tyrannosaurus rex* had thick scales covering its body. Which **class** of vertebrates did it belong to?

…….....

(1)

(Total 5 marks)

14. (a) The photograph below shows a team of dogs called huskies pulling a sledge across the ice.



Huskies need to survive in a cold climate. They must be able to pull a heavy sledge for a long time each day. Huskies have blue eyes, a fierce nature, a long tail, thick fur, short legs and strong muscles.

Which feature would a dog breeder look for when choosing huskies to breed from? Give a reason for your choice.

Feature …….

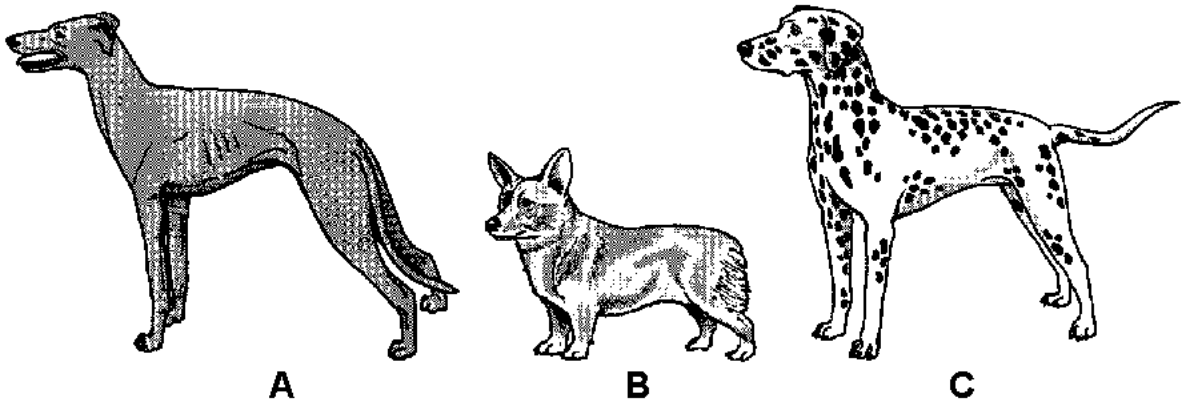
Reason

…….....

…….....

(2)

(b) The drawings below show three dogs. They all look different.



(i) Which word describes the differences between these dogs? Tick the correct box.

adaptation ☐

vaccination ☐

reproduction ☐

variation ☐

(1)

(ii) The drawing below shows a puppy. Dog C is the puppy's mother.



Explain why the puppy looks like his mother.

…….....

(1)

(Total 4 marks)

5. The diagram shows a baby developing inside its mother.



menstruation **uterus** **fertilisation** **foetus** **cell division**

zygote **ovum** **ovary** **digestion** **sperm production** **testis**

(a) Where does the unborn baby develop? Choose your answer from the list above.

.....

(1)

(b) What name is given to an unborn baby? Choose your answer from the list above.

.....

(1)

(c) What takes place in the Fallopian tube (oviduct)? Choose your answer from the list above.

……

(1)

(d) Name **two** things that start at puberty. Choose your answers from the list above.

……

(1)

(Total 4 marks)

END OF BIOLOGY QUESTIONS

25 MARKS AVAILABLE FOR THIS SECTION