SURNAME ..... FIRST NAME .....

JUNIOR SCHOOL ..... SENIOR SCHOOL .....

Independent Schools Examinations Board

COMMON ENTRANCE EXAMINATION AT 13+

SCIENCE

BIOLOGY

Monday 1 November 2010

Please read this information before the examination starts.

- This examination is 40 minutes long.
- The answers should be written on the question paper.
- Answer **all** the questions.
- Calculators may be required.

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1. Underline the option which best completes each of the following:

(a) An animal which lays eggs and has dry scaly skin is a

bird **insect** **mammal** **reptile**

(b) The term nocturnal means

being active at night **being active during the day**

being active during the day and night **being inactive for the winter months**

(c) Plants in a food chain are called

herbivores **primary consumers** **producers** **secondary consumers**

(d) Respiration is

breathing **glucose production**

sweat production **the release of energy from food**

(e) Vitamin C is needed to prevent

anorexia **obesity** **rickets** **scurvy**

(f) Chloroplasts in a plant cell

allow certain substances in and out **are the sites of photosynthesis**

control its activities **store energy**

(g) The arrows in a food web represent the

direction of sunlight **direction of travel**

flow of energy **flow of water**

(h) Fertilisation occurs when

an egg cell is released **an embryo starts to grow**

a farmer puts nitrogen on his crops **a sperm enters an ovum**

(i) The enzymes in the gut

are absorbed into the blood **are made of starch**

break down large food molecules **carry oxygen**

(j) The chemical used to test for the presence of carbon dioxide is

iodine solution **lemon juice** **limewater** **starch**

(10)

2. Read the following passage about the skeleton and fill in the gaps, using words from the word box below. Words can be used once, more than once or not at all.

organised	biceps	triceps	antagonistic	oxygen	tendons
nails	enzymes	complimentary	vitamins	organs	bone

The human skeleton is made of ..... . One function of the skeleton is to protect various delicate ..... in the body. It also provides an attachment for muscles. These normally occur in pairs and are attached to the skeleton by ..... . In the arm, there are two muscles called the ..... and the triceps which move the forearm. In order to move the forearm upwards the ..... contract whilst the ..... relax. Two muscles which work with opposite effect are called ..... muscles. (7)

3. (a) Changes take place in the bodies of boys and girls during adolescence.

The table below shows some changes which take place in boys and girls.

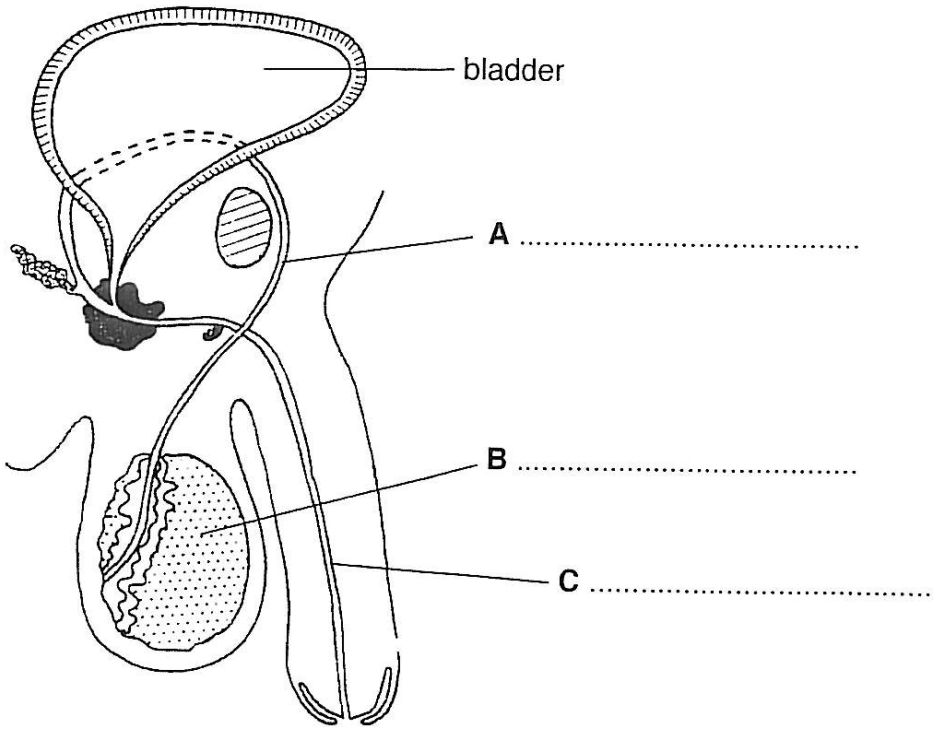
Fill in the table by giving three further examples of physical changes which take place during puberty.

boys	girls
testes increase in size	uterus increases in size

(6)

(b) The diagram below shows the structure of the male reproductive system.

Label the structures **A**, **B** and **C** indicated below on the diagram. (3)



(c) Give the functions of structures **A** and **B**.

function of structure **A**: .....

..... (1)

function of structure **B**: .....

..... (1)

4. Micro-organisms such as viruses and bacteria may cause disease.

Salmonella is a bacterium which can cause food poisoning.

The table below shows the number of people per 100 000 who were infected by salmonella between 2000 and 2003.

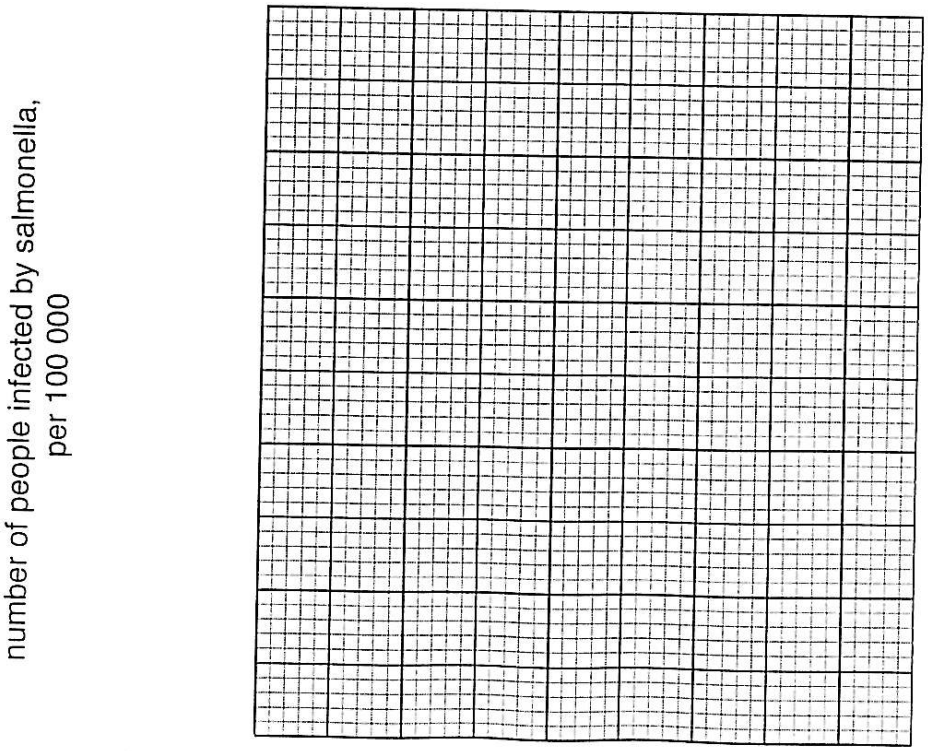
year	number of people infected by salmonella, per 100 000
2000	45
2001	30
2002	37
2003	25

(a) Use the following instructions to help you draw a bar chart on the graph paper below to display the information from the table.

(i) add a sensible scale to the vertical axis (1)

(ii) complete the horizontal axis (1)

(iii) using the table above, draw a bar chart to show how many people were infected by salmonella per 100 000 for each year (3)



(b) Most of these cases of food poisoning were traced back to food shops and restaurants.

Suggest three ways in which the food may have become infected with salmonella.

suggestion 1: .....

.....

suggestion 2: .....

.....

suggestion 3: .....

..... (3)

5. Photosynthesis is how plants make their own food.

(a) Photosynthesis can be represented by the word equation below.

Fill in the missing words.

..... + ... ⟶ ..... + ... (2)

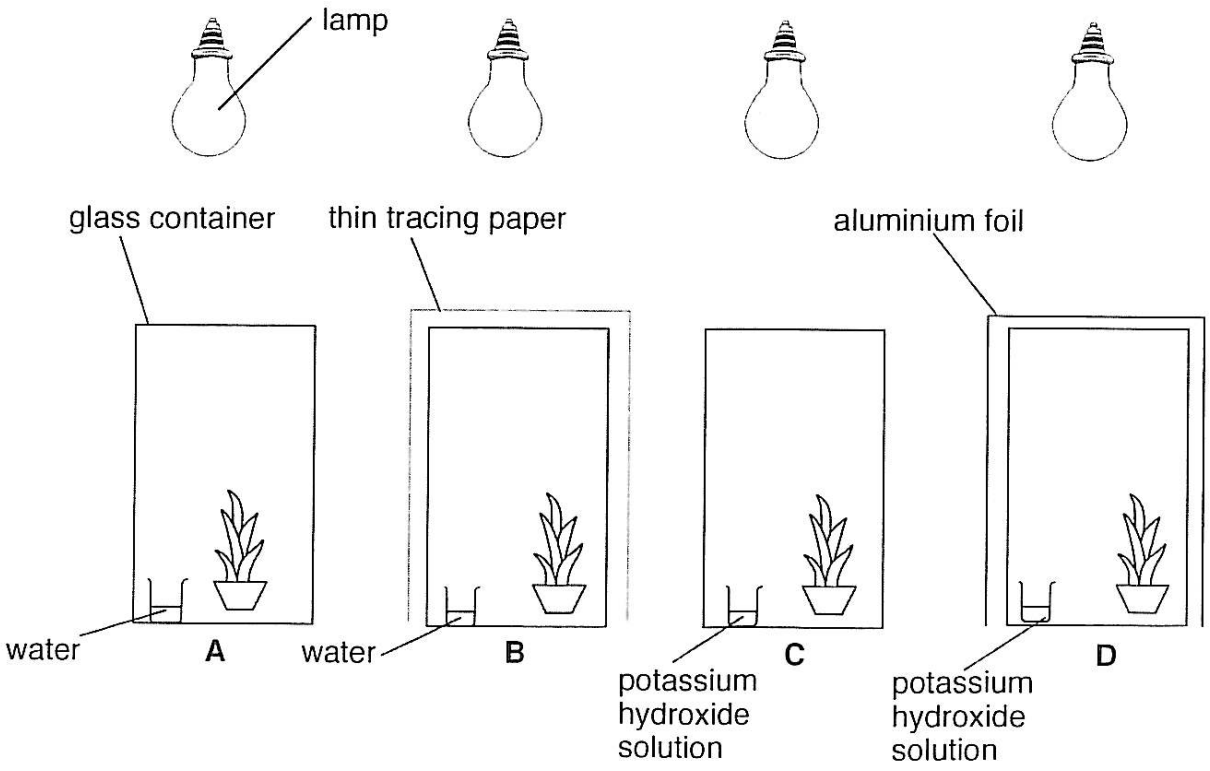
(b) Name the source of energy for photosynthesis.

..... (1)

(c) In an experiment to investigate the conditions needed for photosynthesis, four plants were each placed under a lamp and subjected to the conditions shown in the diagram below.

After 48 hours, a leaf of equal size from each plant was then tested for the presence of starch.

Potassium hydroxide solution absorbs carbon dioxide from the air.



A table of results is shown below:

tube	results of the starch test
A	positive
B	positive
C	negative
D	

(i) The result for tube **D** has been left blank.

Fill in the expected result. (1)

(ii) Give two reasons for your answer.

1: .....

2: ..... (2)

(iii) Suggest why the leaf from tube **A** would probably have had more starch than the leaf from tube **B**.

.....

..... (1)

(iv) Describe how you would safely test the leaves for starch.

.....

.....

.....

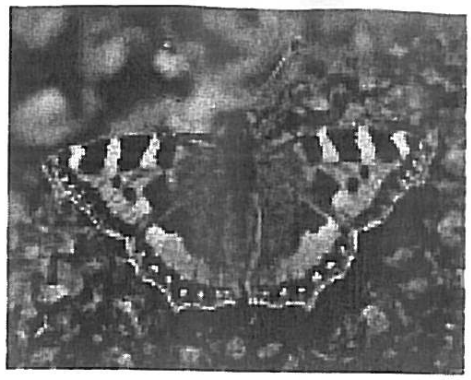
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.....

.....

..... (4)

6. The photograph below shows an insect called the small tortoiseshell butterfly.



(a) State three characteristics of an insect.

1: .....

2: .....

3: ..... (3)

Although the small tortoiseshell butterfly was once common in Britain, its population size fell each year from 1980 to 2002.

Persistently wet summers and predation by a small wasp were thought to be the reasons for the lower numbers found.

(b) (i) Explain the meaning of the term *predation*.

.....

..... (1)

(ii) Suggest how predation has made the small tortoiseshell butterfly rare in Britain.

.....

..... (1)

Larger numbers of small tortoiseshell butterflies have been found in southern counties of England in recent years.

One explanation is that warmer and drier autumn weather has encouraged the butterflies to cross the English Channel from France.

(c) The movement of the butterflies over the Channel is an example of migration.

Suggest two reasons why animals migrate.

1: .....

.....

2: .....

..... (2)

(d) Explain the ways in which an animal which you have studied is adapted to its habitat.

Include in the spaces provided the ways in which your animal is adapted to changes of conditions.

animal studied: .....

how the animal you have studied is adapted to its habitat: .....

.....

.....

.....

..... (2)

how the animal adapts to different times of the day: .....

.....

.....

.....

..... (2)

how the animal adapts to different seasons of the year: .....

.....

.....

.....

..... (2)

(Total marks: 60)