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

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

Independent Schools Examinations Board

COMMON ENTRANCE EXAMINATION AT 13+

SCIENCE

BIOLOGY

Monday 24 January 2011

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) If iodine solution were poured onto a piece of bacon, its colour would be

blue/black **brown/orange** **green** **white**

(b) Muscles work across a joint

aggressively **alternately** **amiably** **antagonistically**

(c) The food which contains the best source of protein is

citrus fruit **potato** **rice** **salmon**

(d) All living things

breathe **eat** **jump** **respire**

(e) The male gamete in humans is called the

egg **ovary** **sperm** **testes**

(f) A disease primarily caused by a poor diet is

athlete's foot **influenza** **scurvy** **tuberculosis**

(g) The average length of the menstrual cycle in humans is approximately

7 days **14 days** **28 days** **40 days**

(h) In feeding relationships, herbivores are

consumers **decomposers** **predators** **producers**

(i) In order to germinate, all seeds need

compost **fertiliser** **sunlight** **water**

(9)

2. The following sentences are about nutrition.
Use the words below to fill in the spaces.
These words may be used once, more than once or not at all.

carbohydrates **fats** **fibre** **minerals** **proteins** **vitamins** **water**

We need to eat a balanced diet in order to be healthy.

Most of our energy comes from ..... .

We need ..... for growth and repair.

Iron and calcium are examples of ..... .

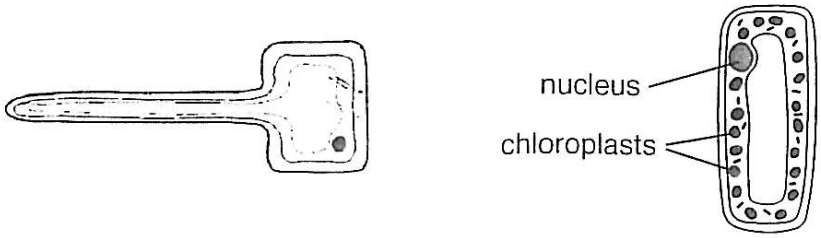
A nutrient which we do not digest but which keeps our intestines healthy is

..... .

It is important to drink plenty of ..... to stay hydrated.

(5)

3. The diagram below shows a root hair cell and a leaf cell of a plant.



(a) Name one feature which shows that these are both plant cells.

..... (1)

(b) State the function of the chloroplasts in a leaf cell.

..... (1)

(c) Suggest why chloroplasts are not found in root hair cells.

..... (1)

(d) Describe and explain how the root hair cell is adapted to its function.

.....

..... (2)

4. Humans need to exchange gases with their surroundings in order to survive.

(a) (i) Write down the name of the organ where gas exchange takes place in humans.

..... (1)

(ii) Write down the name of the organ where gas exchange takes place in fish.

..... (1)

(b) Humans absorb oxygen from the air which is needed for the process of respiration.

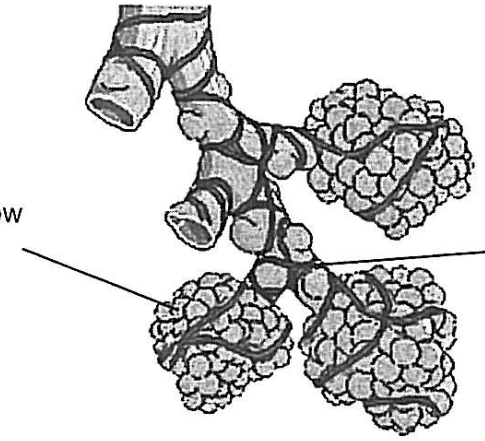
(i) Where does the process of respiration take place in humans?

..... (1)

(ii) Complete the word equation below for respiration.

..... + ... → ..... + ... + ... (3)

The diagram below shows the gas exchange surfaces which are found inside mammals.



(c) Suggest two ways in which the structure of alveoli helps gas exchange to take place efficiently.

1: .....

2: ..... (2)

5. Molly decided that she wanted to grow tomatoes in her garden.

(a) Name the gas needed by plants for photosynthesis.

..... (1)

(b) Name the gas which plants produce during photosynthesis.

..... (1)

(c) Tomatoes turn from green to red as they ripen.
They also become sweeter in taste as sugar collects in the tomatoes.
Explain how sugar collects in the ripening tomatoes.

.....

.....

.....

..... (3)

(d) Molly found that her tomatoes did not ripen very well in her garden and so she decided to plant them in a greenhouse the following year.

Suggest two advantages of growing plants in a greenhouse rather than in the garden.

1: .....

2: ..... (2)

6. Vertebrates are classified using the five groups listed below.

amphibians **birds** **fish** **mammals** **reptiles**

(a) Describe two ways in which an amphibian differs from a reptile.

Difference 1:

An amphibian ..... whereas a

reptile .....

Difference 2:

An amphibian ..... whereas a

reptile ..... (2)

(b) Name two features of a penguin which show that it is a bird.

1: .....

2: ..... (2)

(c) Name a mammal which lives entirely in water.

..... (1)

(d) Name a mammal which can fly.

..... (1)

7. A group of Year 8 pupils prepared and viewed some of their cheek cells using a microscope.

(a) Describe how you could prepare some of your own cheek cells so that they are ready to be viewed using a microscope.

.....

.....

.....

.....

..... (4)

(b) Explain how you would use the microscope to view the cheek cells which you have prepared.

.....

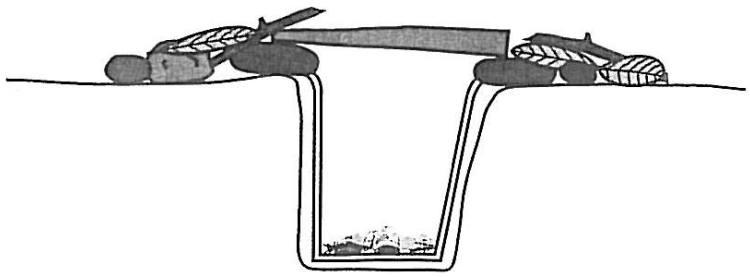
.....

..... (2)

8. Isabel and Frankie decided to investigate which small invertebrates lived near their school by setting pitfall traps.

They put half the traps under a hedge and half in a pine wood.

They left the traps overnight and then identified the invertebrates before returning them to their habitats.



They recorded their results as follows:

	woodlice	spiders	mites	centipedes	total
hedge	32	13	15	5	65
pine wood	1	4	5	2	

Use the information in the table above to answer the following questions:

(a) Complete the table to show the total number of invertebrates found in the pine wood. (1)

(b) Name the most common invertebrate found in the hedge.

..... (1)

(c) Name the least common invertebrate found in their investigation.

..... (1)

(d) The table below shows the pH of the soil in the hedge and in the pine wood.

soil location	pH
hedge	7.2
pine wood	5.3

Suggest why there were fewer invertebrates in the pine wood than under the hedge.

.....

..... (1)

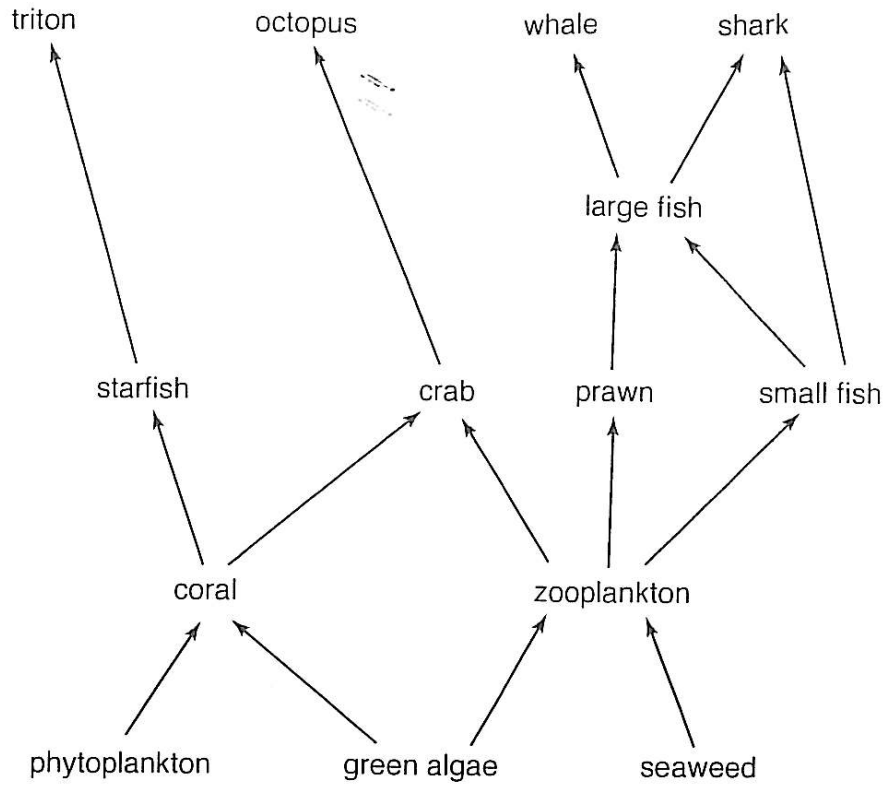
(e) Many invertebrates break down dead organisms.

Suggest why this process is so important for life on Earth to continue.

.....

..... (2)

9. The diagram below shows a food web for a coral reef in Indonesia.



(a) Suggest why the phytoplankton, green algae and seaweed are called *producers*.

..... (1)

(b) What do the arrows in the food web show?

..... (1)

(c) Name the organism which depends upon crabs for survival.

..... (1)

(d) Name an organism which is a secondary consumer.

..... (1)

The starfish are destroying large areas of coral reef.

They are preyed upon by tritons.

Triton shells are collected by tourists as ornaments.

(e) Suggest why the collection of tritons by tourists is leading to the destruction of the coral reefs.

.....

.....

..... (2)

(f) Suggest how we could protect coral reefs from further destruction.

.....

.....

..... (2)

(Total marks: 60)