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

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

Independent Schools Examinations Board

COMMON ENTRANCE EXAMINATION AT 13+

SCIENCE

BIOLOGY

Monday 25 January 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 feathers is

a bird **an insect** **a mammal** **a spider**

(b) The source of energy for all food chains is

food **glucose** **green plants** **the Sun**

(c) A germinating seed is able to survive before it can photosynthesise because it has a

food store **root** **seed coat** **shoot**

(d) An example of a gamete is

an epithelial cell **a nerve cell** **a root hair cell** **a sperm cell**

(e) The nucleus

controls the cell **photosynthesises** **respires** **stores energy**

(f) The place where an organism lives is

a community **a country** **an ecosystem** **a habitat**

(g) An omnivore eats

both animals and plants **neither animals nor plants**

only animals **only plants**

(h) The roots of plants

absorb minerals from the soil **contain chloroplasts**

contain no living cells **make food**

(8)

2. A balanced diet is essential for a healthy lifestyle.
Different types of foods and food groups are shown below.

(a) Link each food group on the left to its function on the right with a straight line.

food group	function
carbohydrates	prevents scurvy
fats	prevents constipation
proteins	used for energy storage and insulation
calcium	immediate source of energy
vitamin C	needed to strengthen bones and teeth
fibre	growth and repair

(6)

(b) Describe what is meant by a *balanced diet*.

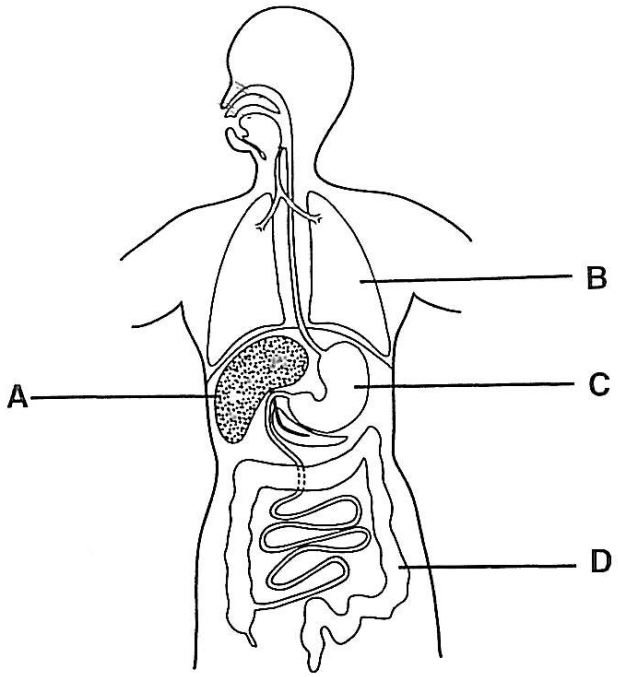
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..... (2)

3. The diagram below shows the positions of some major organs in the human body.



(a) Using the diagram above, match the name of the body part with the letter on the diagram and complete the table below. *(The first one has been done for you.)*

letter of label	part of the body
A	liver
B	
C	
D	

(3)

In digestion, large food molecules are broken down into smaller molecules.

(b) Name the type of molecule which helps food to be digested.

..... (1)

(c) What happens to the food molecules which have been broken down?

.....

..... (2)

4. The diagram below shows John measuring the pulse rate of Louise after she has been resting for two minutes.



(a) Explain why John is using the pulse rate as a measure of Louise's resting heart rate.

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..... (2)

John and Louise perform an experiment on heart rate and exercise.

They both measure their resting pulse rates and measure them again immediately after running 1500 m.

They both run at the same speed.

The results are shown below:

	resting pulse rate, in beats per minute	pulse rate after exercise, in beats per minute
John	62	121
Louise	60	100

(b) (i) Describe the changes to the pulse rates during exercise.

..... (1)

(ii) Explain why this happens.

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..... (3)

(c) Suggest one reason why Louise's pulse rate did not increase as much as John's.

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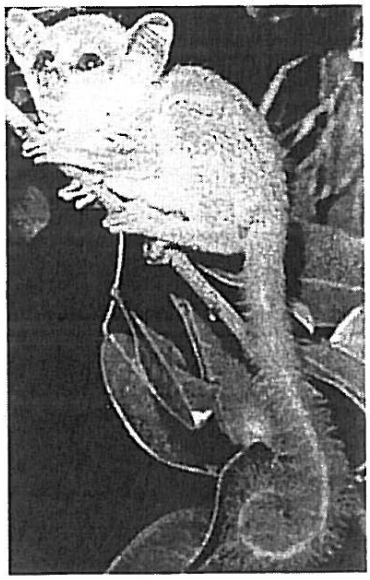
..... (1)

(d) Their teacher thought that it may not have been a fair test.
Suggest two reasons why it may not have been fair.

1: .....

2: ..... (2)

5. The photograph below shows a mammal called a bush baby.
It lives in the branches of trees in the tropical regions of East Africa.



(a) State two characteristics of a mammal.

1: .....

2: ..... (2)

(b) A bush baby is normally active at night when it feeds on insects.
Suggest one advantage of being active at night.

..... (1)

A bush baby has special features which help it move around and feed at night.

(c) Suggest and explain **two** features which help it to move around and feed at night.

feature 1: .....

.....

explanation 1: .....

.....

feature 2: .....

.....

explanation 2: .....

..... (4)

The habitats of the bush baby are the forests of East Africa.

Many of these forests are being cut down to provide wood.

(d) Suggest what local conservation organisations may be doing to help the bush baby to survive.

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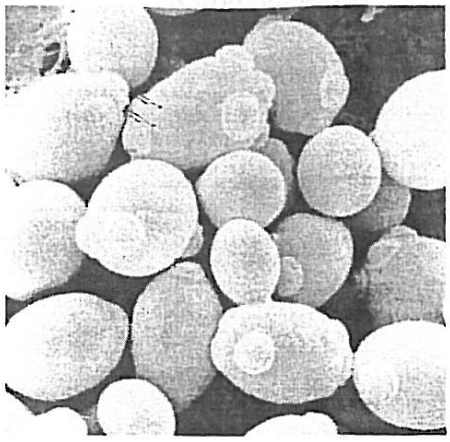
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..... (4)

6. The photograph below shows cells of a micro-organism called yeast.



Yeast is a single-celled fungus which respires glucose to produce carbon dioxide and alcohol.

Yeast obtains energy from respiration.

(a) Suggest how the yeast cells use the energy which is released in respiration.

..... (1)

Yeast is used to make drinks such as beer and wine.

(b) Suggest why yeast is used to make beer and wine.

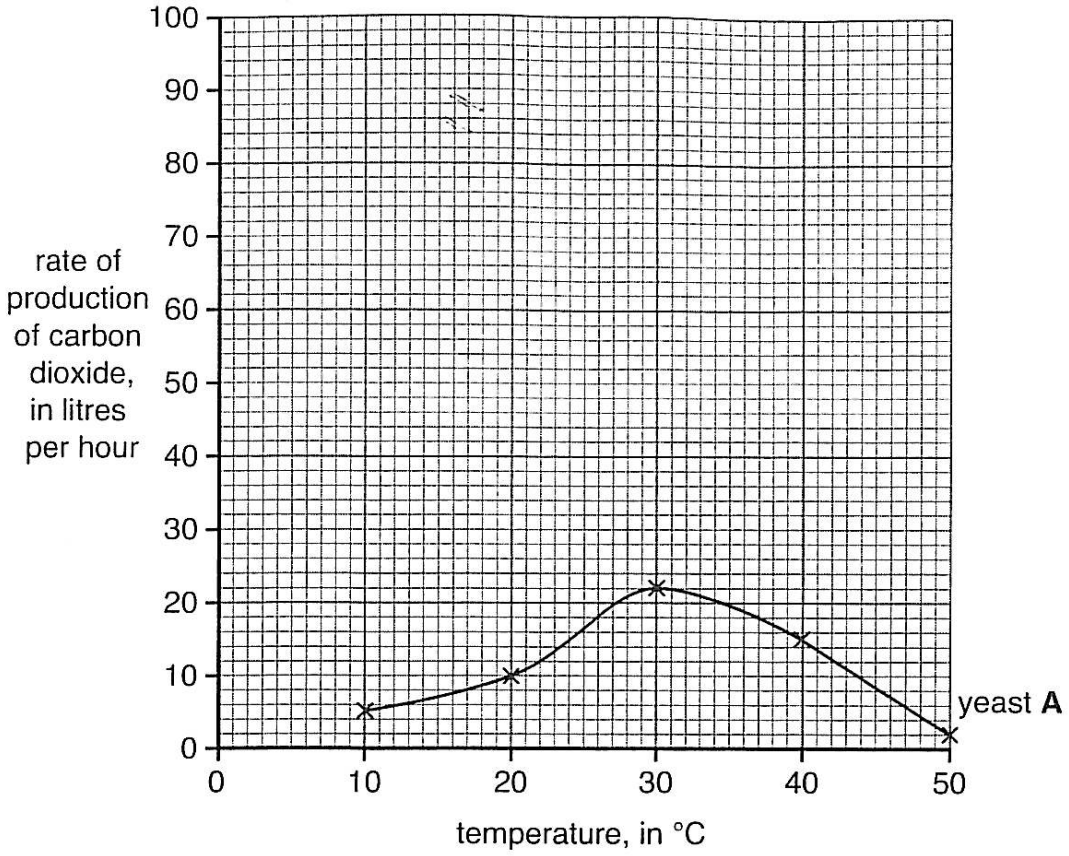
..... (1)

The production of carbon dioxide by two different types of yeast (**A** and **B**) was investigated at various temperatures.

The results are shown in the table below.

temperature, in °C	rate of production of carbon dioxide, in litres per hour	
	yeast **A**	yeast **B**
10	5	8
20	10	15
30	22	40
40	15	80
50	2	100

The graph below shows the results for yeast **A**.



(c) (i) Complete the graph by plotting the results for yeast **B**. (2)

(ii) Draw a smooth curve through the points. (1)

(d) Describe the differences between the rate of production of carbon dioxide at the different temperatures for the two types of yeast.

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..... (2)

(e) Predict which type of yeast, **A** or **B**, would be best for making alcoholic drinks. Explain your prediction.

prediction: .....

explanation: .....

.....

..... (2)

7. The table below shows the average number of units of alcohol consumed by men and women per week between 2004 and 2006.

	average number of units of alcohol consumed per week	
year	men	women
2004	7.8	2.1
2005	8.2	5.2
2006	9.0	7.2

(a) Describe the patterns in the results shown in the table.

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..... (4)

(b) Suggest how drinking too much alcohol can damage health.

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..... (3)

(c) Apart from reducing alcohol intake, suggest two ways in which people could lead a healthier lifestyle.

1: .....

2: ..... (2)

(Total marks: 60)