Write your name here

Surname	Other names

Edexcel
International GCSE

Centre Number | | | | | |

Candidate Number | | | | |

Human Biology

Unit: 4HB0
Paper: 02

Thursday 9 May 2013 – Morning
Time: 1 hour

Paper Reference
4HB0/02

You must have:
Ruler
Candidates may use a calculator.

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
  – *there may be more space than you need.*
- Show all the steps in any calculations and state the units.

Information

- The total mark for this paper is 60.
- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Write your answers neatly and in good English.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ▶

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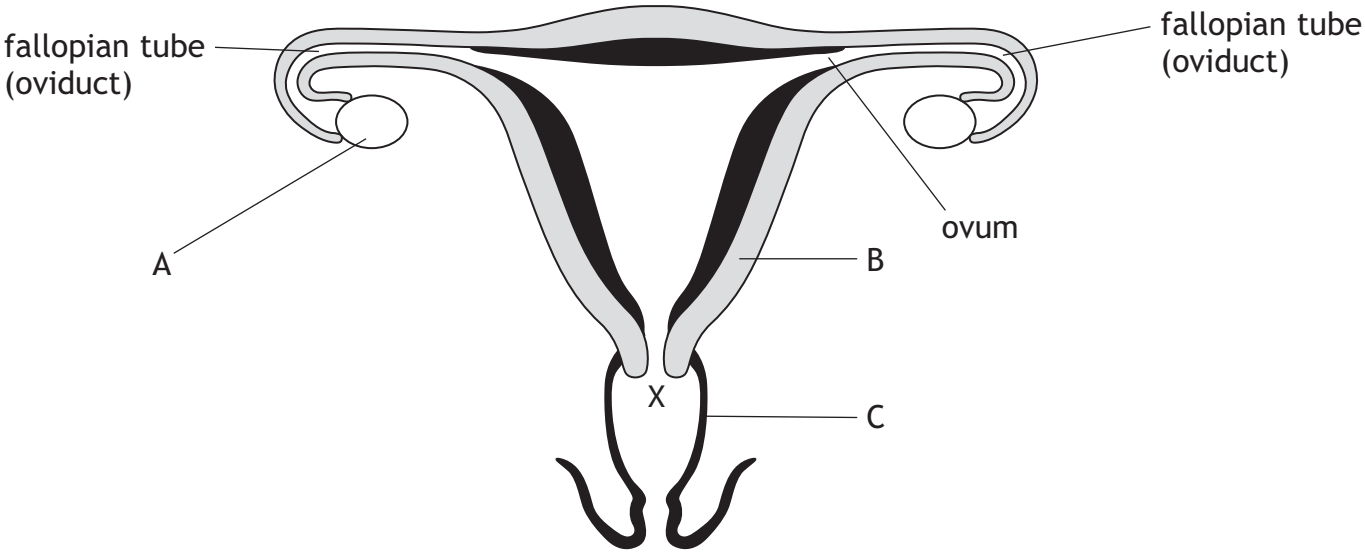
1/1/1/

P 4 1 5 5 9 A 0 1 1 2

PEARSON

Answer ALL questions.

1 The diagram shows the human female reproductive system on the 14th day of a 28-day menstrual cycle.



(a) Name the parts labelled A, B and C.

(3)

A .....

B .....

C .....

(b) Describe and explain **two** ways in which this female reproductive system would be different in the first three days of the menstrual cycle.

(4)

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(c) State three things that could happen to a sperm after it has been deposited at point X.

(3)

1 .....

2 .....

3 .....

(d) Gonorrhoea is a disease which causes severe inflammation of fallopian tubes (oviducts), causing them to become blocked.

(i) Explain how gonorrhoea may affect the fertility of a woman.

(2)

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(ii) Explain **one** way in which the spread of gonorrhoea can be prevented.

(2)

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(Total for Question 1 = 14 marks)

2 Here is a report written by a student to describe an experiment using the enzyme pepsin.

- A 2% solution of pepsin was made using distilled water and pepsin powder.
- Six test tubes were labelled **A**, **B**, **C**, **D**, **E** and **F**.
- 10 cm^3 of the pepsin solution was placed into each test tube.
- The pepsin solution in tubes **D**, **E** and **F** was boiled for two minutes.
- Three drops of dilute hydrochloric acid were added to tubes **B** and **D**.
- Three drops of sodium hydroxide solution were added to tubes **C** and **E**.
- Solid egg white was added to each of the six test tubes.
- The test tubes were then placed in a water bath at 40 °C.

After six hours, the contents of tube **B** were clear as the solid egg white had been completely digested, and the contents of tube **A** had cleared slightly. There was no change to the contents of the other test tubes.

(a) Another student wanted to repeat the experiment. The student has test tubes, labels, beakers, a tripod, a Bunsen burner and a gauze mat.

Name three other pieces of **apparatus** that the student would need in order to repeat the experiment.

(3)

1 .....

2 .....

3 .....

(b) (i) State one variable, not mentioned in the report, that should be kept constant.

(1)

.....

(ii) Explain why keeping this variable constant makes it a fair test.

(1)

.....

.....

.....

(c) The student produced a table to record the results of the experiment.

Complete the table to show the treatment and the result for each test tube. You do not need to comment on the presence of pepsin and egg white.

One of the entries has been completed for you.

(5)

Test Tube	Treatment	Result
A	nothing added, not boiled	slightly clear
B		
C		
D		
E		
F		

(d) What do the results tell the student about the action of pepsin?

(2)

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(Total for Question 2 = 12 marks)

3 Bilharzia is a disease caused by the parasite Schistosoma. The disease is carried by water-living snails.

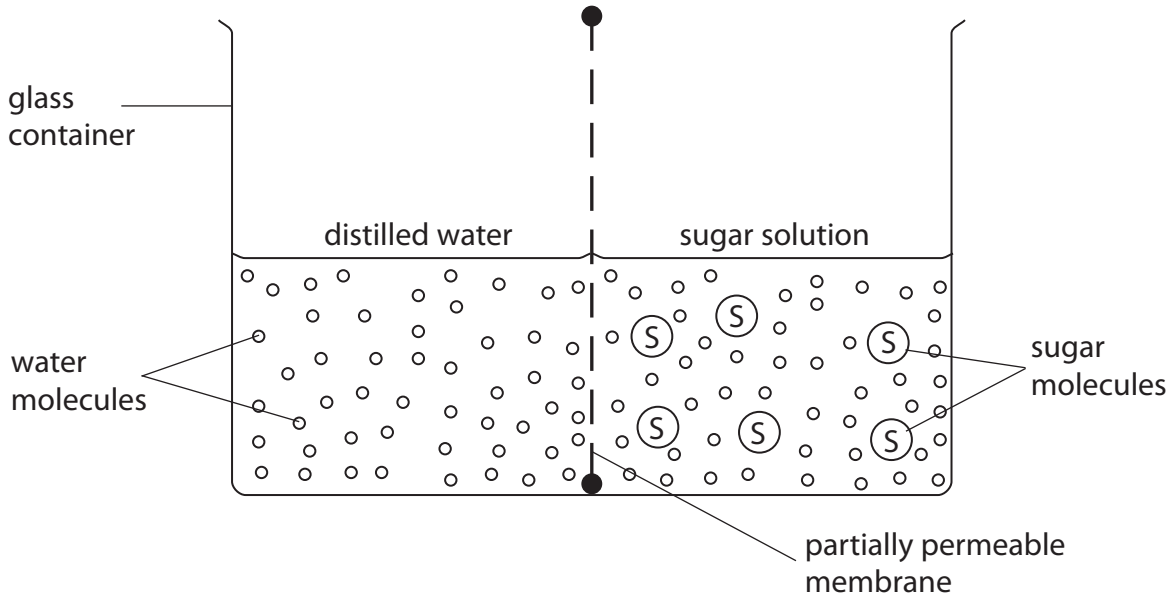
Describe methods that can be used to prevent the spread of schistosomiasis (bilharzia).

(8)

(Total for Question 3 = 8 marks)

4 The diagram shows an experiment in which a concentrated sugar solution was separated from distilled water by a partially permeable membrane.

The apparatus was left for one hour.



(a) On the diagram, draw the levels of the distilled water and the sugar solution after one hour.

(2)

(b) Explain why these changes have occurred.

(2)

(c) Suggest why this process is of benefit to the human body.

(2)

(Total for Question 4 = 6 marks)

5 Cystic fibrosis is a recessive condition caused when the normal allele is mutated. The recessive allele results in the presence of very thick mucus. This thick mucus causes a blockage of the pancreatic duct.

(a) (i) Describe what is meant by the term **mutated** allele.

(2)

(ii) Describe the effects of a blockage of the pancreatic duct.

(2)

(b) (i) A man and a woman who do not have cystic fibrosis produce a child who has the condition.

Using a suitable genetic diagram, show how this is possible.

In your diagram, use **F** to represent the allele for the normal condition and **f** to represent the allele for the cystic fibrosis condition.

(4)

(ii) If this man and woman have a second child, state the chances that it will be

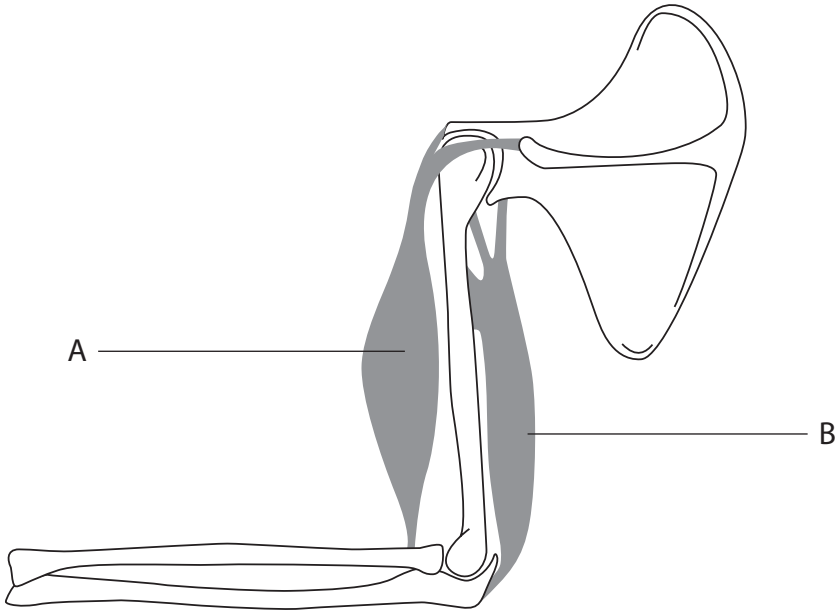
(2)

a girl .....

a child that does not have cystic fibrosis .....

(Total for Question 5 = 10 marks)

6 The diagram shows two muscles which move the human arm.



(a) Name the type of synovial joint shown at

(i) the elbow

(1)

(ii) the shoulder

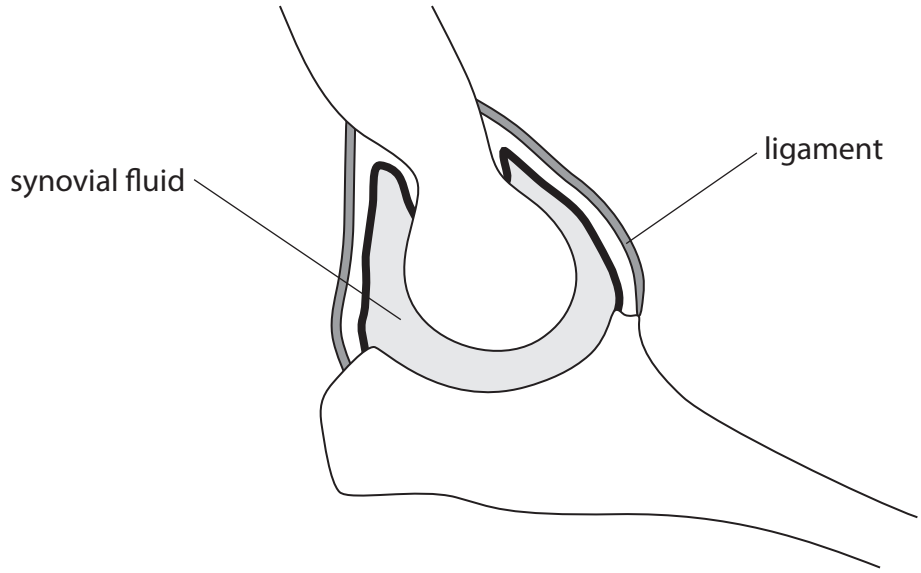
(1)

(b) Describe how the two muscles, A and B, cause movement of the forearm.

(4)

(c) Explain why the person whose elbow joint is shown in the diagram below is likely to have difficult and painful movement of the joint.

(4)



(Total for Question 6 = 10 marks)

TOTAL FOR PAPER = 60 MARKS

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