



Centre Number

71	
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Candidate Number

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General Certificate of Secondary Education
2010

Science: Double Award (Non-Modular)

Paper 1
Foundation Tier

[G8401]



FRIDAY 21 MAY, MORNING

TIME

1 hour 30 minutes.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.

Write your answers in the spaces provided in this question paper.
Answer **all sixteen** questions.

INFORMATION FOR CANDIDATES

The total mark for this paper is 110.

Quality of written communication will be assessed in question **1(a)**.

Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.

Details of calculations should be shown.

Units must be stated in numerical answers where appropriate.

For Examiner's
use only

Question Number	Marks
1	
2	
3	
4	
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11	
12	
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14	
15	
16	

Total
Marks

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- 2 The table shows the results of a survey into the smoking habits of 1000 lung cancer patients.

Number of cigarettes smoked per day	Number of lung cancer patients
0	3
1–4	51
5–14	259
15–24	302
More than 24	385

- (a) What trend is shown by these results?

_____ [1]

- (b) What do the results show about non-smokers?

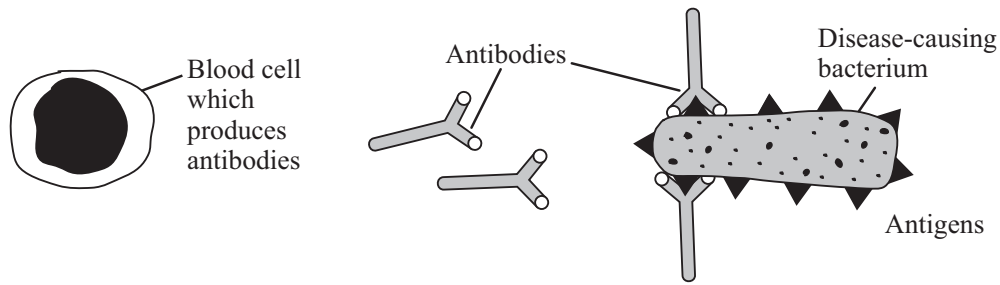
_____ [1]

- (c) Name one **other** disease that can be caused by smoking.

_____ [1]

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Marks	Remark

- 3 The diagram shows antibodies being produced by a blood cell and a disease-causing bacterium being attacked by them.



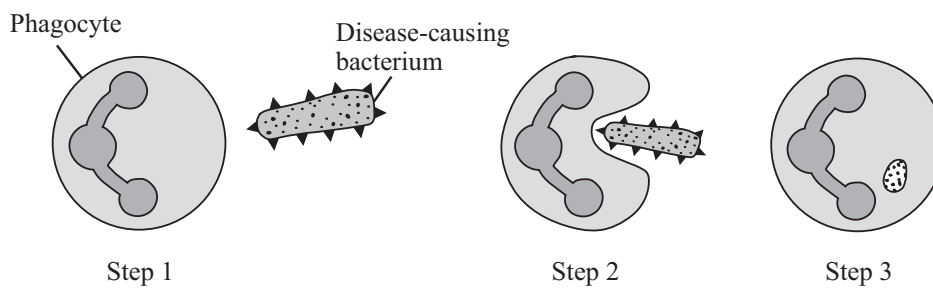
- (a) Name the type of blood cell which produces antibodies.

[1]

- (b) In the space below, draw a bacterium that would **not** be attacked by the antibodies above.

[1]

Invading bacteria can be killed by blood cells called phagocytes as shown in the diagram below.

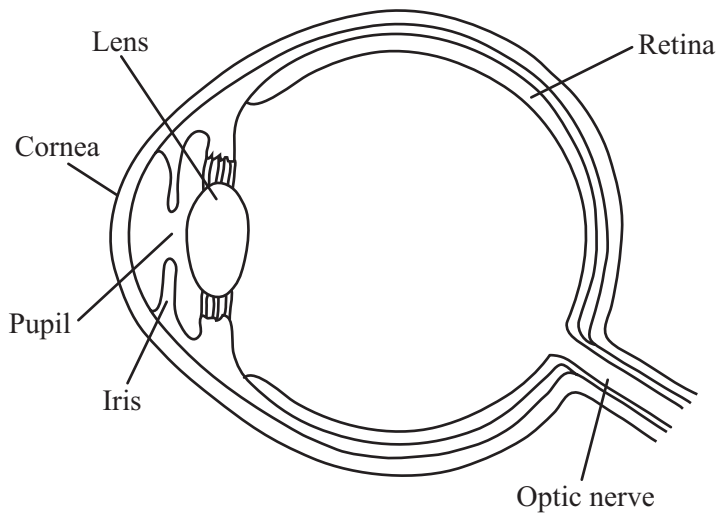


- (c) Use the diagram to help describe how phagocytes kill invading bacteria.

_____ [2]

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Marks	Remark

4 The diagram shows a section through the eye.



(a) Which structure, labelled in the diagram,

(i) is stimulated by light _____

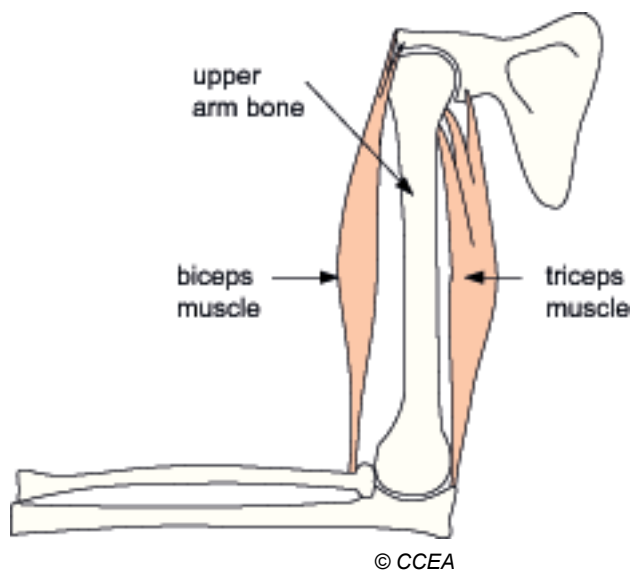
(ii) prevents too much light from entering the eye? _____ [2]

(b) Name **one** structure (not shown on the diagram) that helps to prevent dust and dirt from entering the eye.

_____ [1]

Examiner Only	
Marks	Remark

- 6 The diagram shows the muscles and bones in the arm. The biceps and triceps muscles help to control movement in the arm.



- (a) Describe what happens to the biceps and triceps muscles to straighten the arm.

Biceps _____

Triceps _____ [2]

- (b) The biceps and triceps are **antagonistic** muscles. What does this term mean?

_____ [1]

Examiner Only

Marks Remark

9 (a) Draw a line to connect the type of drug to its effect on the body.

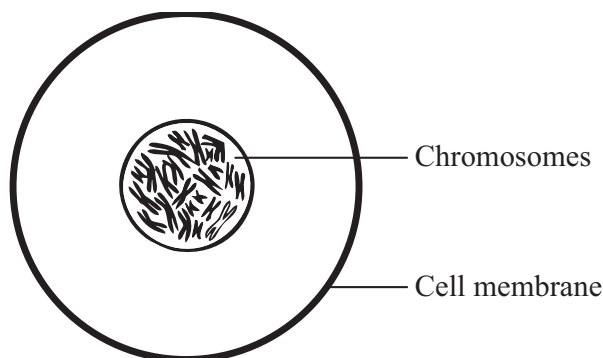
Type of Drug	Effect on the body
Depressant e.g. sleeping pills	drowsiness
Hallucinogen e.g. ecstasy	makes you more alert
Stimulant e.g. caffeine	can cause flashbacks or bad trips

[3]

(b) Suggest how the long-term abuse of some drugs can cause problems for society.

_____ [1]

10 The diagram shows a cell with chromosomes.



(a) Where in the cell are the chromosomes located?

_____ [1]

(b) What are short sections of chromosomes called?

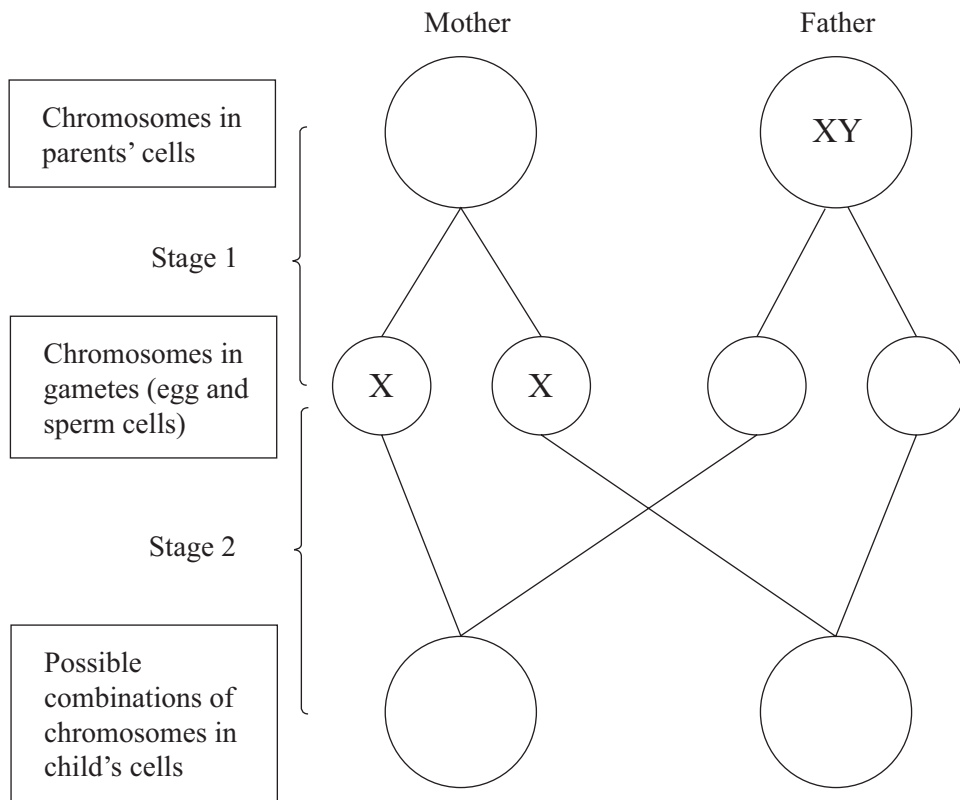
_____ [1]

(c) What chemical are chromosomes made from?

_____ [1]

Examiner Only	
Marks	Remark

12 The diagram shows how the sex of a child depends on the chromosomes it inherits from its parents.

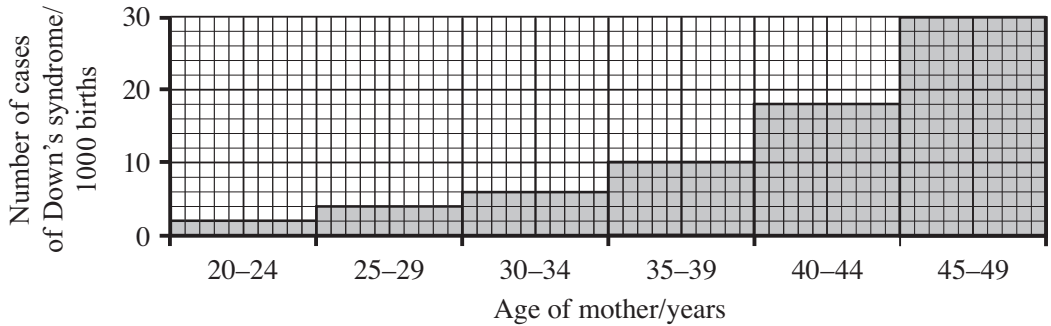


Complete the diagram above to show the sex chromosomes found in each cell. [3]

Examiner Only	
Marks	Remark

13 Down's syndrome is one example of an inherited disease where all the cells of the individual have 47 chromosomes rather than 46.

The histogram shows how the risk of having a child with Down's syndrome increases with the age of the mother.



(a) Use the histogram to calculate how many times more likely it is for a 42 year old woman to have a Down's syndrome baby than a 32 year old woman. Show your working.

_____ times [2]

During pregnancy it is possible to detect the presence of Down's syndrome in the developing baby by testing a sample of the amniotic fluid.

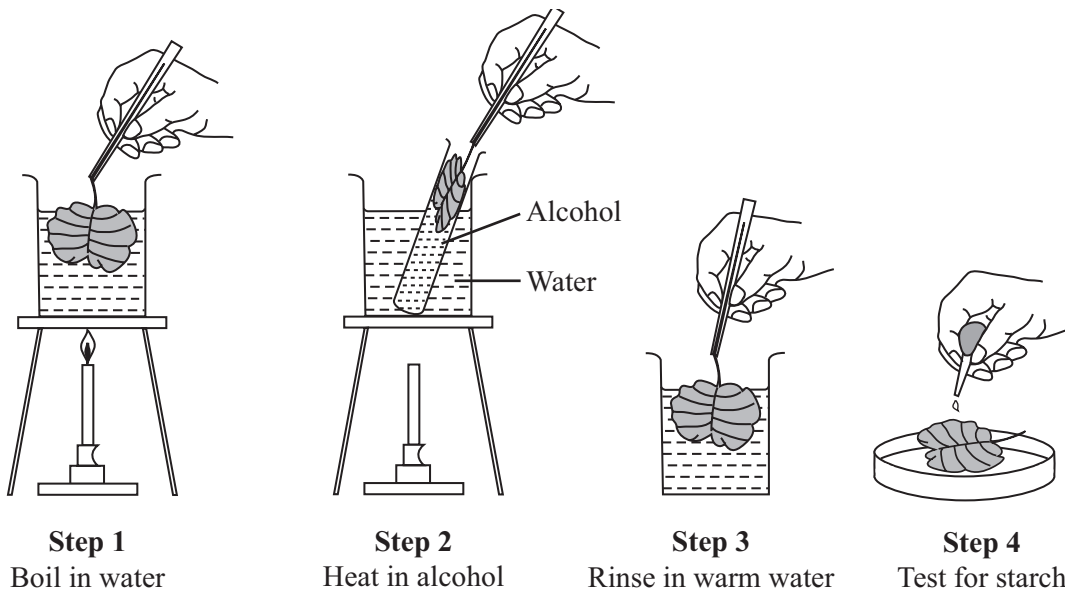
(b) What must be present in the amniotic fluid so that the test can be carried out?

_____ [1]

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Marks	Remark

The diagrams show the stages in the starch test on the leaves from the plant.

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Marks	Remark



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(ii) What is the purpose of

Step 2 _____

Step 3? _____ [2]

(iii) Why is the Bunsen burner turned off before Step 2?

_____ [1]

(iv) In Step 4, iodine solution is added to the leaves to test for starch.

What colour would you expect to obtain when iodine is added to the leaf from

Flask 1 _____

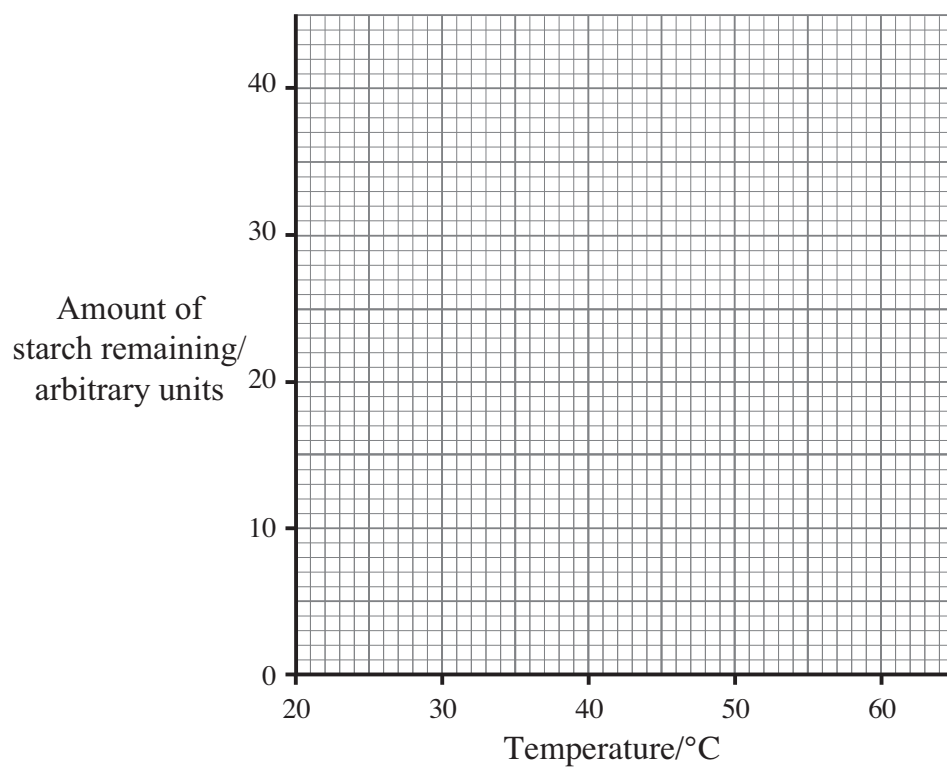
Flask 2? _____ [2]

- (c) The enzyme amylase breaks down starch. John carried out an experiment with amylase to see how much starch remained after 15 minutes at different temperatures.

The table gives his results.

Temperature/°C	Amount of starch remaining/ arbitrary units after 15 minutes
20	30
30	16
40	10
50	25
60	35

- (i) Draw a line graph of the results.



[3]

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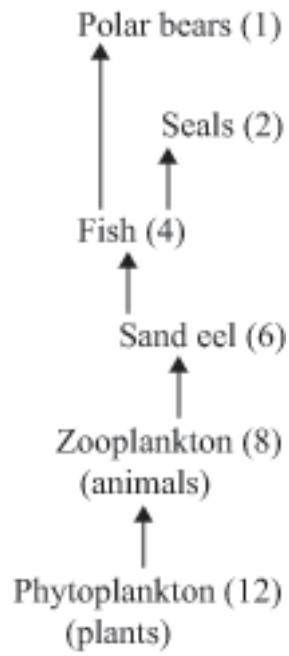
Marks

Remark

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(Questions continue overleaf)

15 (a) The diagram shows a food web for an island in the Arctic.



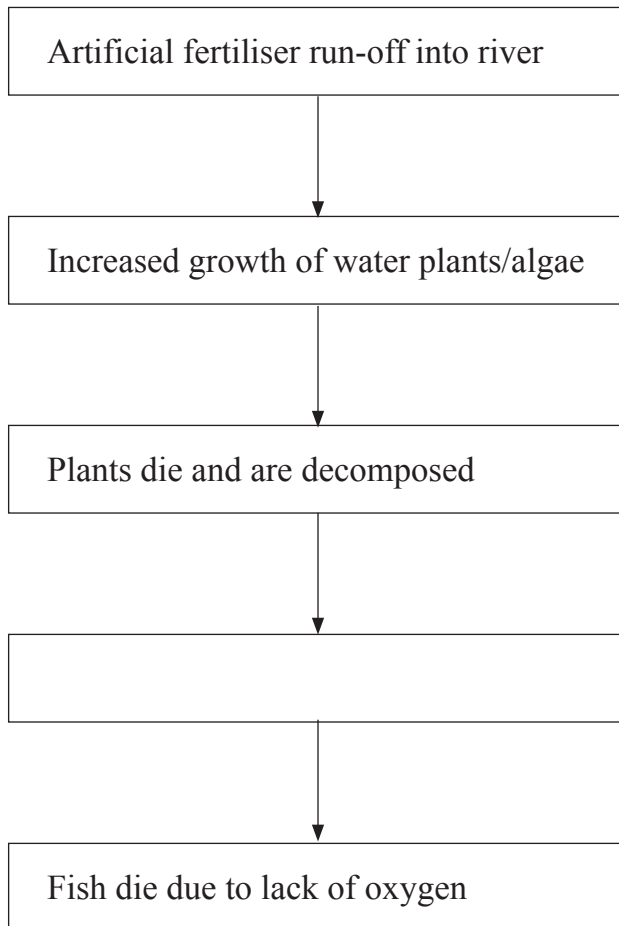
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Marks	Remark

(vii) Explain why it is an advantage for the polar bear to have more than one food source.

_____ [1]

(b) The flow diagram shows the effects of artificial fertiliser run-off in rivers.



(i) Complete the empty box in this process. [1]

(ii) Name **one** other substance that could cause the same effect if it entered a river.

_____ [1]

(iii) Explain how hot water from cooling processes can lead to the death of fish if added to a river.

_____ [1]

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Marks	Remark

16 (a) (i) In the space below draw a labelled diagram of a sperm cell.

[3]

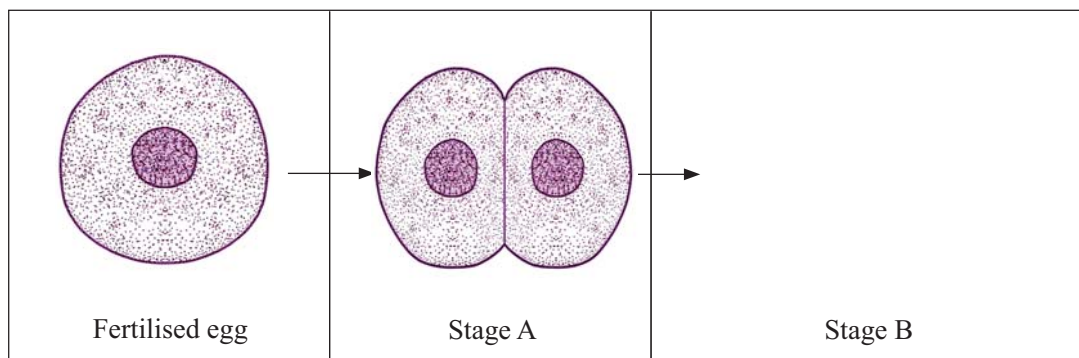
(ii) Give **one** way this cell is adapted for its function.

_____ [1]

(iii) Name the part of the male reproductive system that produces sperm.

_____ [1]

(b) The diagrams show some stages in the development of an egg after fertilisation.



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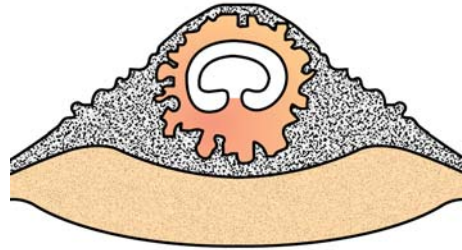
(i) Describe what has happened to the fertilised egg to produce the result at stage A.

_____ [1]

(ii) Complete the diagram at stage B to show what happens next. [2]

Examiner Only	
Marks	Remark

A later stage of development is shown in the diagram below.

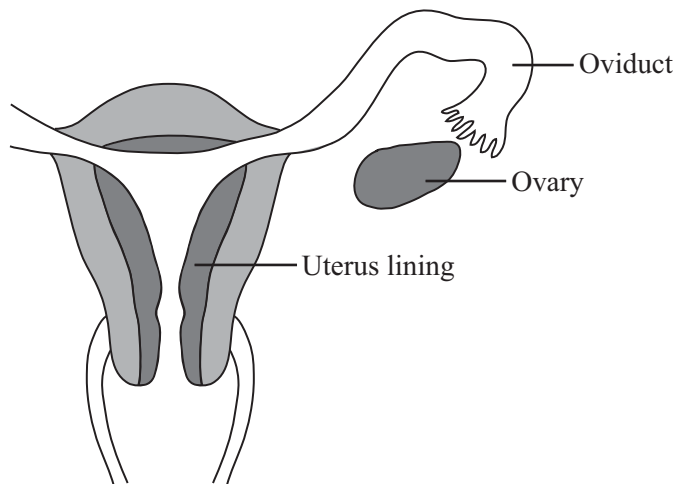


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(iii) Describe what has happened to reach this stage.

[1]

(c) The diagram shows part of the female reproductive system.



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(i) On the diagram mark with an **X** where the process of fertilisation occurs. [1]

(ii) Mark on the diagram with an **I** where implantation will occur. [1]

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