CAMBRIDGE IGCSE BIOLOGY · 0610

BIOLOGY



EXAM QUESTION PACK

TOPIC 16: REPRODUCTION

SCORE	PERCENTAGE
/	%

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Reproduction – 2023 November IGCSE 0610

1. Nov/2023 /Paper_ 0610/11/No.28

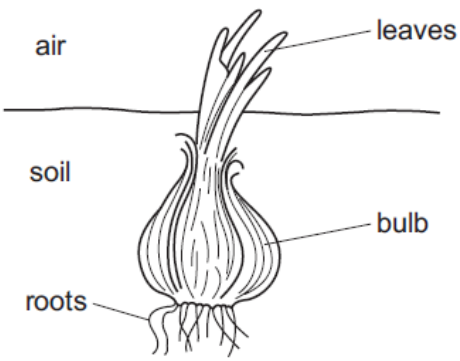
The diagram shows a human sperm cell.

Which structure digests the egg cell membrane?



2. Nov/2023 /Paper_ 0610/11/No.30

Some species of plants can reproduce by producing bulbs. The diagram shows a bulb.



The bulb is produced by one parent plant and will grow into a new plant.

Which statement about the new plant is correct?

A It is genetically different from its parent and is produced by asexual reproduction.

B It is genetically different from its parent and is produced by sexual reproduction.

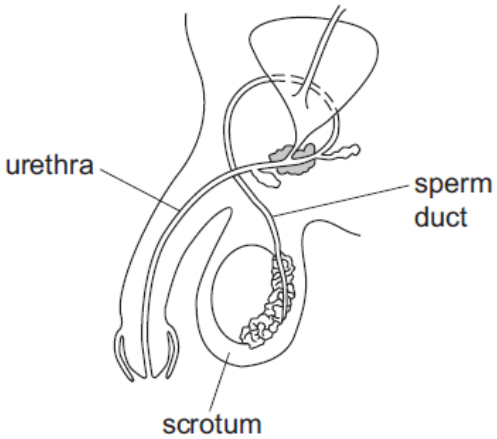
C It is genetically identical to its parent and is produced by asexual reproduction.

D It is genetically identical to its parent and is produced by sexual reproduction.

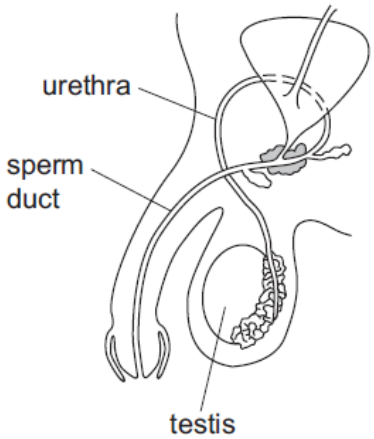
3. Nov/2023 /Paper_ 0610/11/No.31

Which diagram of the male reproductive system is correctly labelled?

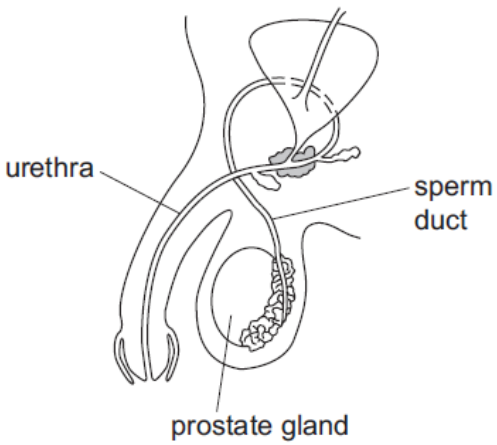
A



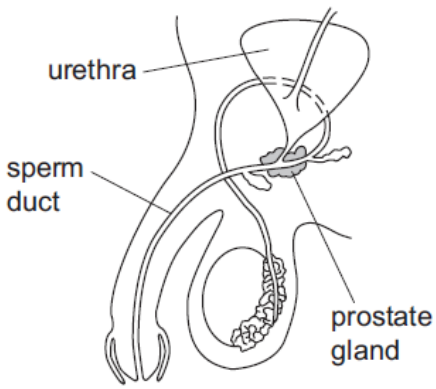
B



C



D



4. Nov/2023 /Paper_ 0610/13/No.24

What is described as a ball of cells that implants into the lining of the uterus?

A acrosome

B embryo

C fetus

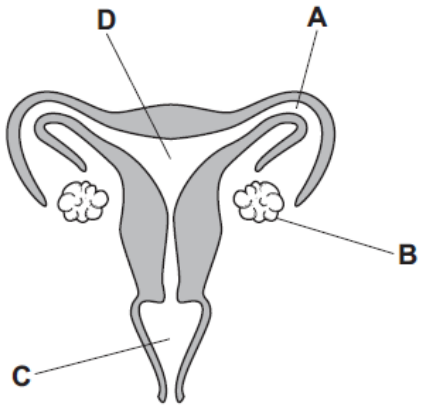
D zygote

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5. Nov/2023 /Paper_ 0610/13/No.33

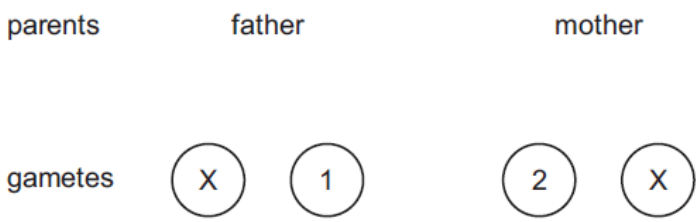
The diagram shows a human female's reproductive organs.

Where does fertilisation usually occur?



6. Nov/2023 /Paper_ 0610/13/No.34

The diagram shows part of a genetic diagram for the inheritance of sex in humans. The sex chromosomes in two gametes are shown.



What are the sex chromosomes in gametes 1 and 2?

	gamete 1	gamete 2
A	X	Y
B	X	X
C	Y	Y
D	Y	X

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7. Nov/2023 /Paper_ 0610/21/No.28

Which diseases can be successfully treated with antibiotics?

	diseases caused by bacteria	rickets	diseases caused by viruses
A	✓	✓	✓
B	✓	✗	✗
C	✗	✓	✗
D	✗	✗	✓

key

✓ = can be treated

✗ = cannot be treated

8. Nov/2023 /Paper_ 0610/21/No.29

Which statement about human sexual reproduction is correct?

A All gametes are haploid.

B Fertilisation occurs when two diploid nuclei fuse.

C The sperm is the male zygote.

D Sexual reproduction results in haploid offspring.

9. Nov/2023 /Paper_ 0610/21/No.30

Where is oestrogen produced?

A cervix

B ovaries

C oviducts

D uterus

10. Nov/2023 /Paper_ 0610/22/No.29

What is a disadvantage of sexual reproduction for a population in the wild?

A a reduction in genetic diversity

B a decreased ability to adapt to changes in the environment

C a reduction in reproduction if individuals are isolated

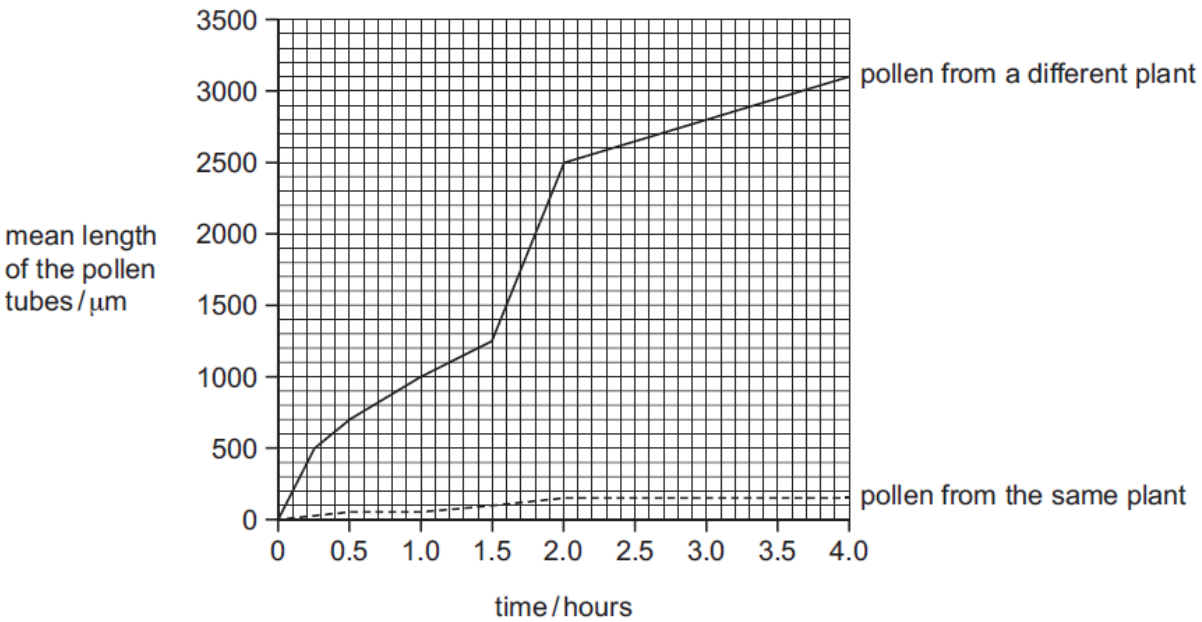
D an increased likelihood of a disease affecting all individuals

11. Nov/2023 /Paper_ 0610/22/No.30

Pollen grains from a plant were placed onto the stigma of a flower of the same plant. The lengths of the pollen tubes were measured for four hours. (The mean length of the style in this species of plant is 2 mm.)

This was repeated using pollen from a different plant.

The results are shown.



Which statements are correct?

1 Self-pollination does **not** lead to fertilisation.

2 The difference in growth of the two types of pollen is an adaptation to increase variation.

3 The pollen tubes from a different plant grew fastest between 2.0 hours and 4.0 hours.

A 1, 2 and 3 **B** 1 and 2 only **C** 1 and 3 only **D** 2 and 3 only

12. Nov/2023 /Paper_ 0610/22/No.31

Which hormones are released by the placenta during pregnancy?

A FSH and LH

B FSH and progesterone

C oestrogen and LH

D progesterone and oestrogen

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13. Nov/2023 /Paper_ 0610/23/No.30

Some descriptions of reproduction are listed.

1 formation of a zygote with a diploid nucleus

2 formation of a zygote with a haploid nucleus

3 fusion of diploid nuclei of two gametes

4 fusion of haploid nuclei of two gametes

Which are correct descriptions of sexual reproduction in humans?

A 1 and 3 **B** 1 and 4 **C** 2 and 3 **D** 2 and 4

14. Nov/2023 /Paper_ 0610/23/No.31

Which statement about pollination in plants is correct?

A Cross-pollination is the transfer of pollen from the anther of a flower to the style of the same flower.

B Cross-pollination is the transfer of pollen from the anther of a flower to the stigma of a flower on a different plant of the same species.

C Self-pollination is the transfer of pollen from the anther of a flower to the filament of the same flower.

D Self-pollination is the transfer of pollen from the anther of a flower to the stigma of a flower on a different plant.

15. Nov/2023 /Paper_ 0610/31/No.5

(a) Fig. 5.1 is a diagram of an insect-pollinated flower.

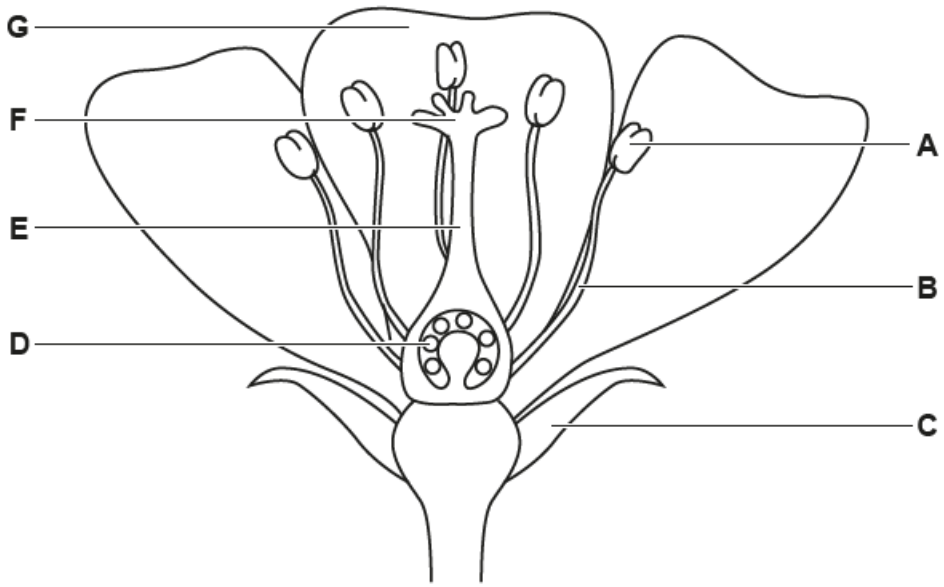


Fig. 5.1

(i) State the letters of the structures in Fig. 5.1 that make up the stamen.

..... and .....

[2]

(ii) State the letter of the structure in Fig. 5.1 where fertilisation takes place.

..... [1]

(iii) Explain how the part labelled **G** in Fig. 5.1 is adapted for its function.

.....

.....

.....

.....

..... [2]

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(b) **(i)** Complete the sentence about pollination.

Pollination is the transfer of pollen grains from the ..... to the

..... .

[2]

(ii) State **three** ways that pollen grains from insect-pollinated flowers differ from pollen grains from wind-pollinated flowers.

1 .....

2 .....

3 .....

[3]

[Total: 10]

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16. Nov/2023 /Paper_ 0610/32/No.7

(a) Fig. 7.1 is a diagram of the female reproductive system in humans.

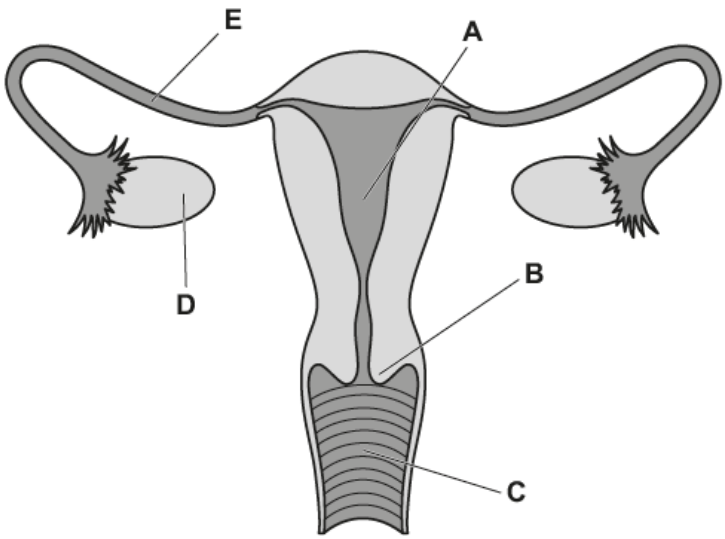


Fig. 7.1

Table 7.1 shows the name, letter and function of some of the parts in Fig. 7.1.

Complete Table 7.1.

Table 7.1

name of the part	letter in Fig. 7.1	function
uterus		where the fetus grows
		where fertilisation occurs
	D	

[5]

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(b) This list shows some specialised animal and plant cells.

ciliated cell	**guard cell**
neurone	**palisade mesophyll cell**
red blood cell	**white blood cell**

Choose words from the list to state the names of:

- two specialised plant cells

  ..... and .....

- the cell that transports oxygen

  .....

- the cell found in the trachea that moves mucus.

  .....

[4]

(c) State how new cells are produced.

.....

..... [1]

(d) Fig. 7.2 is a drawing of another specialised cell.

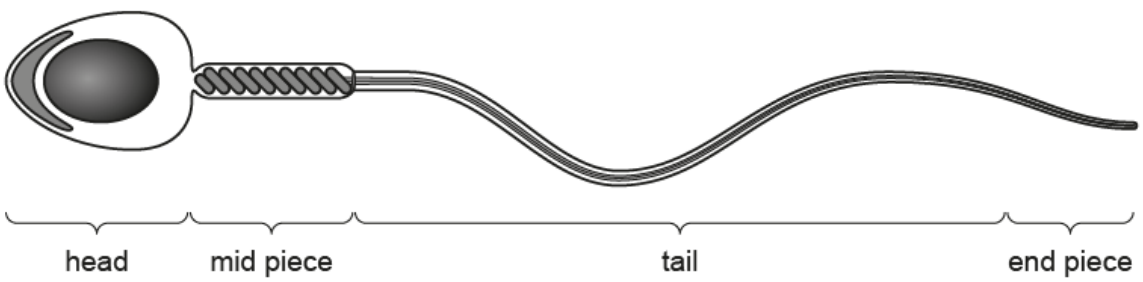


Fig. 7.2

(i) Label **three** cell structures in Fig. 7.2 with label lines and the correct names. [3]

(ii) State the name of the cell shown in Fig. 7.2.

..... [1]

[Total: 14]

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17. Nov/2023 /Paper_ 0610/33/No.5

Bluebells are plants that can reproduce sexually and asexually.

(a) (i) Define the term asexual reproduction.

.....

.....

..... [2]

(ii) State **one** example of a structure that is involved in asexual reproduction in a plant.

..... [1]

(b) Fig. 5.1 is a drawing of a bluebell plant.



Fig. 5.1

On Fig. 5.1, label the structure that carries out sexual reproduction with a label line and the letter **S**. [1]

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(c) Bluebells grow in ancient woodlands.

Fig. 5.2 is a graph showing the percentage of land that was covered with woodland in one country from the years 1100 to 2000.

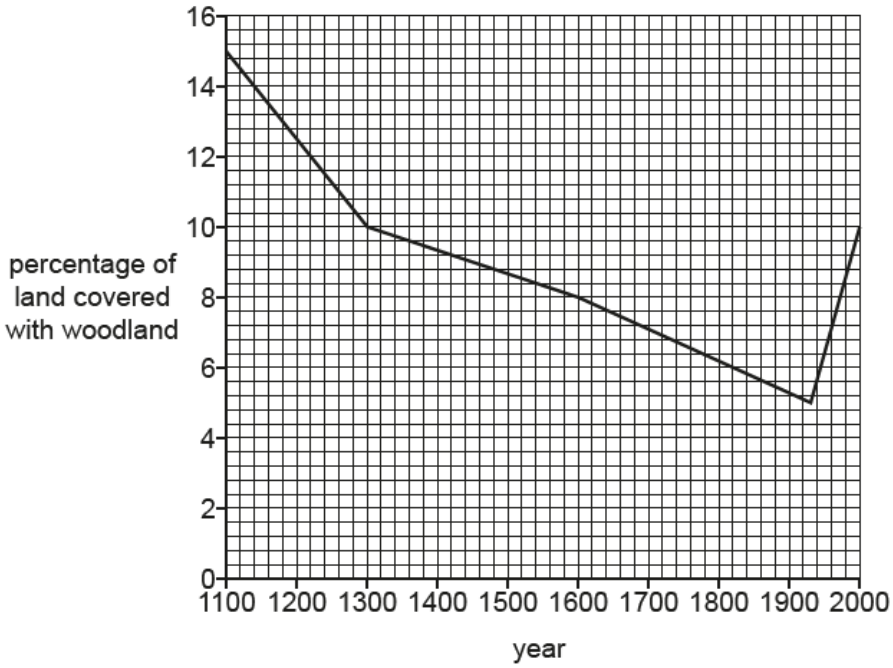


Fig. 5.2

(i) State the years when the percentage of land covered with woodland was 10% in Fig. 5.2.

..... and ..... [2]

(ii) State the percentage of land covered with woodland in 1600 in Fig. 5.2.

..... % [1]

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(d) **(i)** In many countries the percentage of land covered with woodland has decreased because of deforestation.

Suggest **two** reasons why deforestation occurs.

1 .....

.....

2 .....

.....

[2]

(ii) Explain the undesirable effects of deforestation.

.....

.....

.....

.....

.....

.....

.....

.....

..... [3]

[Total: 12]

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18.

(b) Egg cells are contained in follicles in the ovary.

At the start of the menstrual cycle, a follicle has an average diameter of 29 μm.

Just before an egg is released from the follicle, the follicle has an average diameter of 22 mm.

Calculate the percentage increase in the average diameter of the follicle from the start of the menstrual cycle, until just before an egg is released.

Step 1 Convert the average starting diameter of a follicle to millimetres (mm).

..... mm

Step 2 Calculate the percentage increase.

..... %

Step 3 Give your answer to **three** significant figures.

..... %
[4]

(c) Once an egg cell has been released from a follicle it can be fertilised by a sperm cell.

State **three** adaptive features of a sperm cell.

1 .....

2 .....

3 .....
[3]

[Total: 13]

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19. Nov/2023 /Paper_ 0610/42/No.6

(a) State the names of **two** hormones released by the ovaries.

1 .....

2 .....

[2]

(b) During pregnancy, antibodies are acquired by the fetus from the mother.

State the organ the antibodies cross to reach the fetus.

..... [1]

(c) A baby was breastfed for six months. The concentration of antibodies in the baby's blood obtained from breast milk and the concentration of antibodies made by the baby itself were measured.

Fig. 6.1 shows the results.

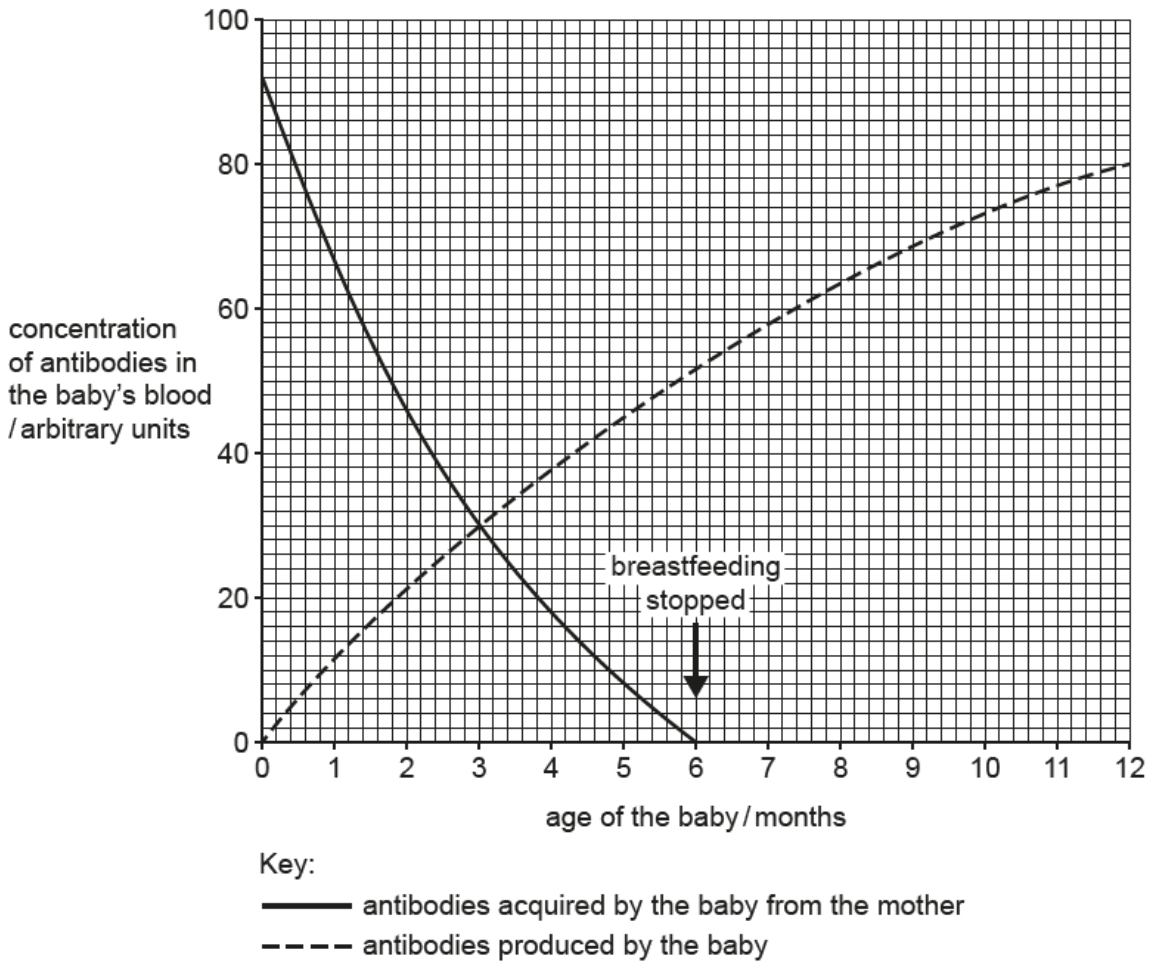


Fig. 6.1

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(i) Complete the sentences to describe the changes in antibody concentration in the baby.

After birth the concentration of antibodies acquired from the mother decreases rapidly to 0 arbitrary units at ..... months.

Antibodies start being produced by cells called ..... in the baby immediately after birth.

The total concentration of antibodies in the baby from both sources is ..... arbitrary units at 4 months.

The concentration of antibodies acquired from the mother and the concentration of antibodies produced by the baby are the same at ..... months.

[4]

(ii) Describe the benefits of breastfeeding a baby for the first six months of life.

.....

.....

.....

.....

..... [2]

(iii) State **two** ways, other than breastfeeding, that a baby can acquire immunity.

1 .....

.....

2 .....

.....

[2]

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(d) Explain the importance of the shape of an antibody.

.....

.....

.....

.....

.....

.....

..... [3]

(e) Antibodies are proteins.

State the chemical elements present in all proteins that are also found in carbohydrates and fats.

..... [1]

[Total: 15]

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20. Nov/2023 /Paper_ 0610/43/No.1

(a) Fig. 1.1 is a diagram of an insect-pollinated flower.

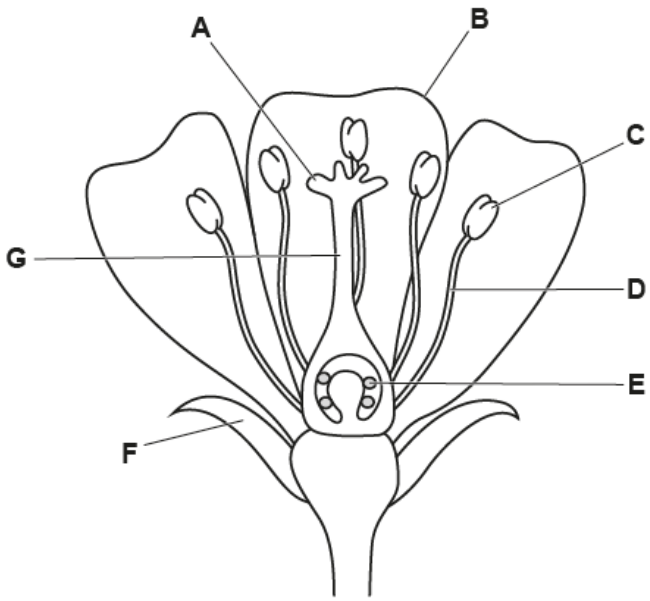


Fig. 1.1

(i) Using the information in Fig. 1.1, complete Table 1.1.

Table 1.1

structure in Fig. 1.1	name	function
A		
B		
F		

[3]

(ii) State the names of the **two** structures that form the stamen in a flowering plant.

1 .....

2 .....

[1]

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(b) (i) Describe the stages in the reproduction of a flowering plant, from self-pollination to fertilisation.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

..... [5]

(ii) Outline the advantages and disadvantages of self-pollination compared with cross-pollination.

.....

.....

.....

.....

.....

.....

.....

.....

.....

..... [4]

[Total: 13]

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Reproduction – 2023 June IGCSE Biology 0610

1. June/2023/Paper_0610/11/No.31

Which statement about sexual reproduction is correct?

A Fertilisation is involved.

B Zygotes fuse.

C Offspring are always genetically identical.

D One female gamete fuses with many male gametes.

2. June/2023/Paper_0610/11/No.32

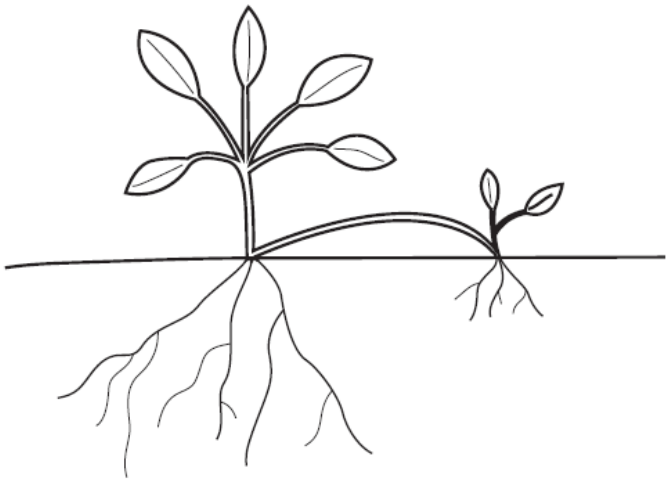
Which row about asexual reproduction is correct?

	number of parents	offspring identical to parents	offspring identical to each other
A	one	no	yes
B	one	yes	yes
C	two	no	no
D	two	yes	no

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3. June/2023/Paper_0610/12/No.30

The diagram shows one way that a plant can reproduce.



What is a feature of this type of reproduction?

A The offspring show genetic variation.

B Only one parent is required.

C Offspring are easily dispersed over a wide area.

D Pollination by insects is required.

4. June/2023/Paper_0610/13/No.27

What is a correct statement about antibiotics?

A Bacteria may become resistant to antibiotics as a result of artificial selection.

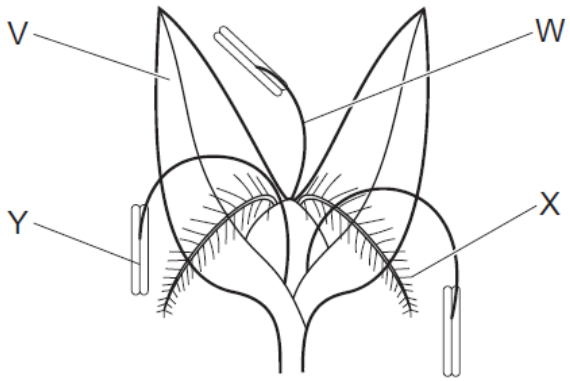
B Bacteria may become resistant to antibiotics as a result of natural selection.

C Viruses may become resistant to antibiotics as a result of artificial selection.

D Viruses may become resistant to antibiotics as a result of natural selection.

5. June/2023/Paper_0610/13/No.28

The diagram shows a wind-pollinated flower.



Which labels are the stigma and anther?

A V and W **B** W and X **C** X and V **D** X and Y

6. June/2023/Paper_0610/13/No.29

During puberty, secretion of hormones causes the development of secondary sexual characteristics.

What is a characteristic caused by the secretion of testosterone?

A breast development

B deepening of voice

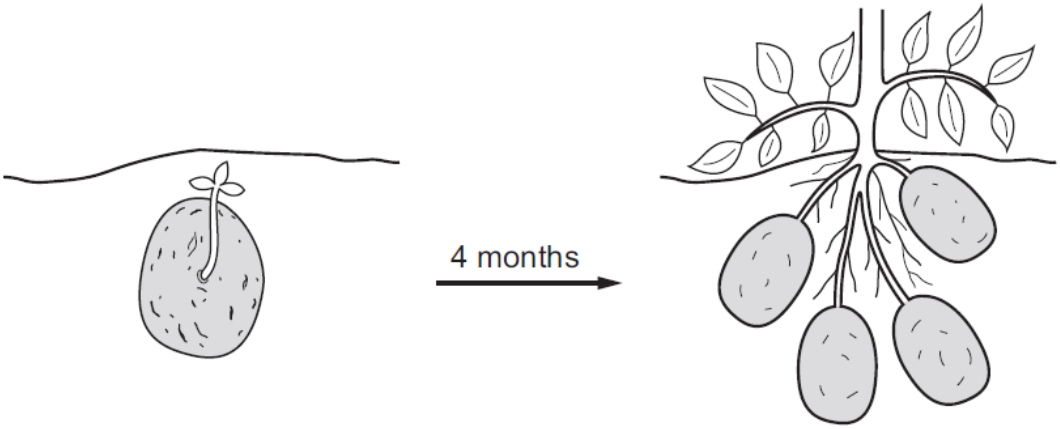
C start of the menstrual cycle

D widening of hips

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7. June/2023/Paper_0610/21/No.28

Potatoes are stem tubers. A tuber can be placed in the ground to grow into another plant, which can grow many more tubers.



The diploid number of the potato plant is 24.

How many chromosomes will there be in the cells of the stem, the leaf and the pollen?

	stem	leaf	pollen
A	24	24	12
B	24	12	48
C	48	12	24
D	48	48	12

8. June/2023/Paper_0610/21/No.29

Which row about asexual reproduction is correct?

	number of parents	offspring identical to parents	offspring identical to each other
A	one	no	yes
B	one	yes	yes
C	two	no	no
D	two	yes	no

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9. June/2023/Paper_0610/22/No.27

What is an advantage of asexual reproduction in a wild population?

A The population has reduced ability to respond to changes in the environment.

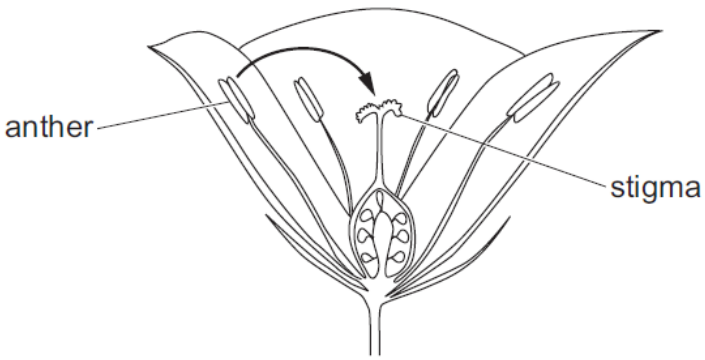
B The population can increase rapidly when conditions are suitable.

C The population shows a lot of variation.

D The whole population may be killed by a disease pathogen.

10. June/2023/Paper_0610/22/No.28

The diagram shows the structure of part of a flower.



The arrow represents the transfer of pollen.

Which statement about the arrow is correct?

A The arrow represents cross-pollination in an insect-pollinated flower.

B The arrow represents cross-pollination in a wind-pollinated flower.

C The arrow represents self-pollination in an insect-pollinated flower.

D The arrow represents self-pollination in a wind-pollinated flower.

11. June/2023/Paper_0610/22/No.29

In a sperm cell, which structure contains enzymes that can digest the jelly coat of an egg cell?

A acrosome

B flagellum

C mitochondria

D nucleus

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12. June/2023/Paper_0610/23/No.27

Where are the hormones oestrogen and progesterone produced during pregnancy?

A amniotic sac

B oviducts

C placenta

D umbilical cord

13. June/2023/Paper_0610/23/No.28

The umbilical artery takes blood from the fetus to the placenta.

The umbilical vein carries blood from the placenta to the fetus.

How do the contents of the umbilical artery differ from those of the umbilical vein?

	carbon dioxide	oxygen	urea
A	less	more	less
B	less	less	more
C	more	more	less
D	more	less	more

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14. June/2023/Paper_0610/33/No.7

(a) Fig. 7.1 is a diagram of part of the male reproductive system.

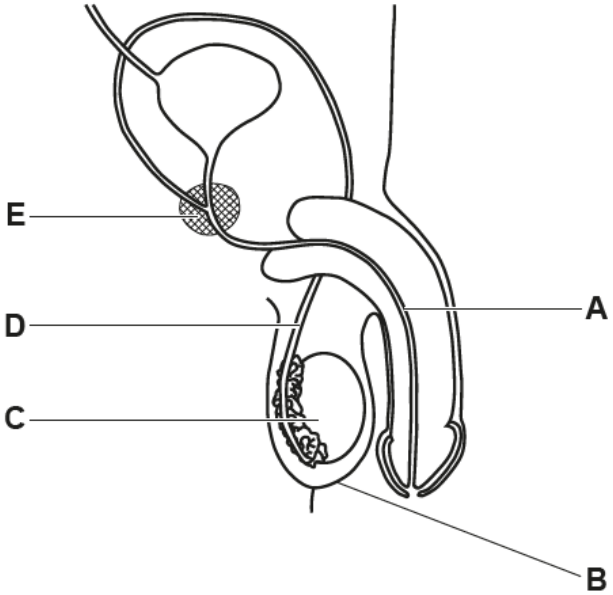


Fig. 7.1

Complete Table 7.1 by writing in the letter of the structure identified in Fig. 7.1 that carries out each function.

Each letter can be used once, more than once or not at all.

Table 7.1

function	letter on Fig. 7.1
carries sperm only	
contains the testes and keeps them cool	
makes the fluid that sperm cells swim in	
produces testosterone	
where sperm are made	

[5]

(b) State the name of the hormone that controls development of secondary sexual characteristics in females.

..... [1]

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15. June/2023/Paper_0610/43/No.5

(a) Describe the role of progesterone in pregnancy.

.....

.....

.....

.....

.....

.....

..... [3]

(b) Fig. 5.1 shows a drawing of a section of a human placenta. The arrows show the direction of blood flow.

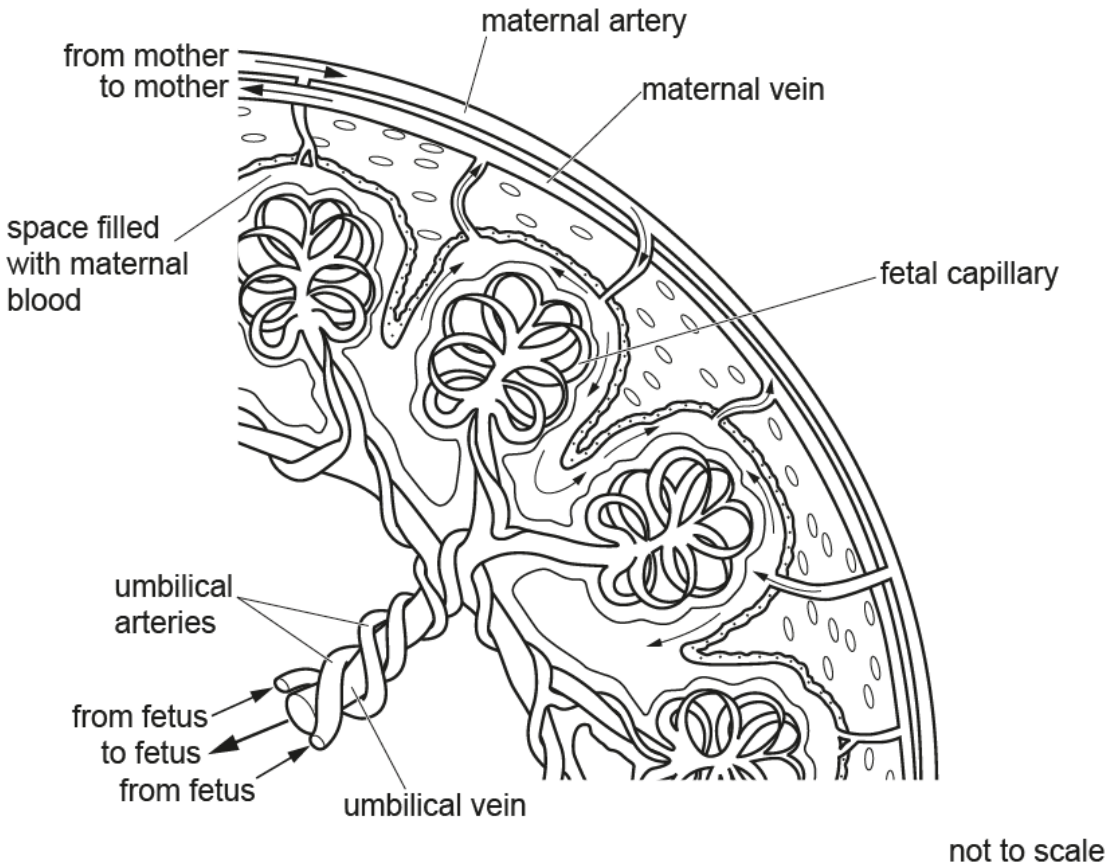


Fig. 5.1

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Substances move across the placenta by diffusion.

(i) State the names of **two useful** substances that move from the blood of the mother to the blood of the fetus.

1 .....

2 .....

[2]

(ii) Using the information in Fig. 5.1, suggest how the placenta is adapted for efficient diffusion.

.....

.....

.....

.....

.....

.....

..... [3]

(c) The Rhesus (Rh) factor is a protein that is found on the surface of red blood cells in some people. If the protein is present then the individual is Rh positive.

The allele for the presence of the Rh factor is dominant and is represented by the letter **D**. The recessive allele is represented by the letter **d**.

If a mother is Rh negative and the fetus is Rh positive there can be problems during pregnancy.

A Rh negative mother and a heterozygous Rh positive father have a child.

Complete the Punnett square and determine the probability of the child being Rh positive.

		father's gametes	
mother's gametes			

probability .....

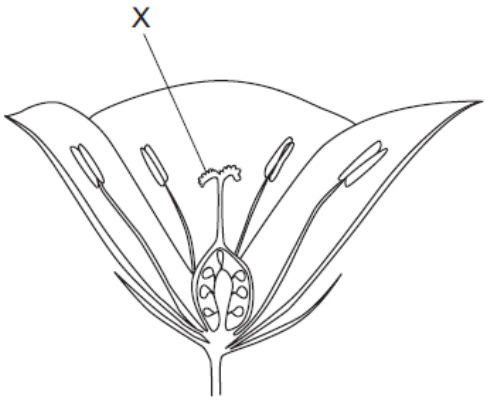
[3]

[Total: 11]

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16. March/2023/Paper_ 0610/12/No.30

The diagram shows part of a flower.



What is the part labelled X?

A anther

B ovary

C sepal

D stigma

17. March/2023/Paper_ 0610/12/No.31

Which statement about the hormones involved in human puberty is correct?

A Oestrogen causes body hair and facial hair to grow in males.

B Oestrogen causes breasts to develop in females.

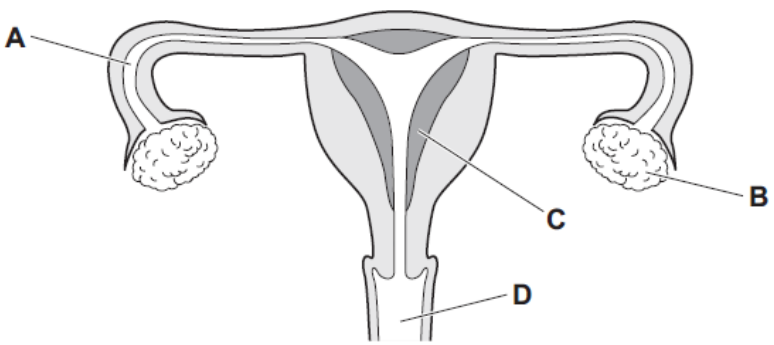
C Testosterone causes the menstrual cycle to begin in females.

D Testosterone causes the hips to get wider in males.

18. March/2023/Paper_ 0610/12/No.32

The diagram shows the human female reproductive system.

In which structure does fertilisation usually occur?



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19. March/2023/Paper_ 0610/22/No.28

What is the order of flower parts through which the pollen tube must grow to reach the egg cell nucleus during fertilisation?

A stigma → style → ovule → ovary

B stigma → style → ovary → ovule

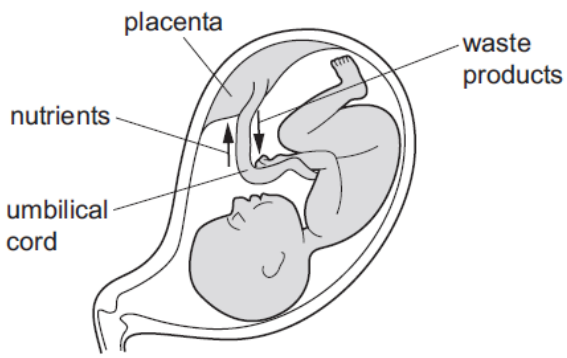
C style → stigma → ovule → ovary

D style → stigma → ovary → ovule

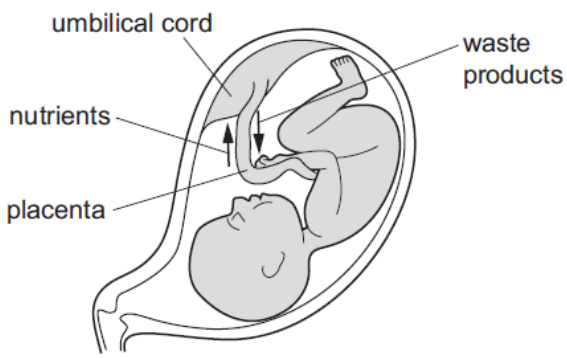
20. March/2023/Paper_ 0610/22/No.29

Which diagram, showing the exchange of products between mother and fetus, is correctly labelled?

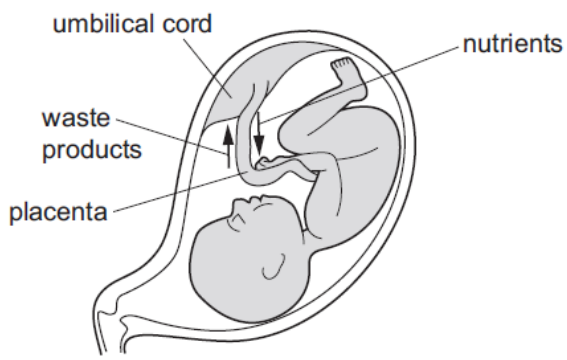
A



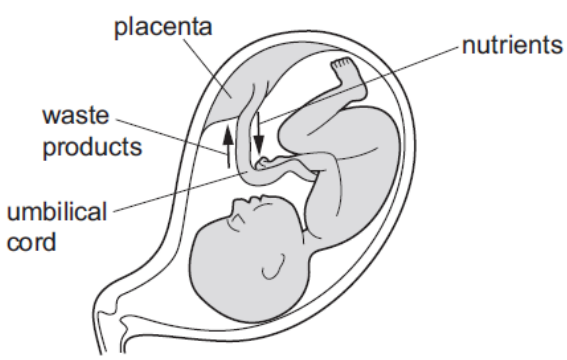
B



C



D



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21. March/2023/Paper_ 0610/22/No.31

Each statement describes cell division by mitosis or meiosis in humans.

1 It produces cells that show variation.

2 It produces cells that are diploid.

3 It produces cells that are haploid.

4 It involves reduction division.

Which statements describe meiosis?

	1	2	3	4
A	✗	✓	✗	✗
B	✓	✗	✗	✓
C	✗	✓	✓	✗
D	✓	✗	✓	✓

key

✓ = yes

✗ = no

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1. Nov/2022/Paper_11/No.31

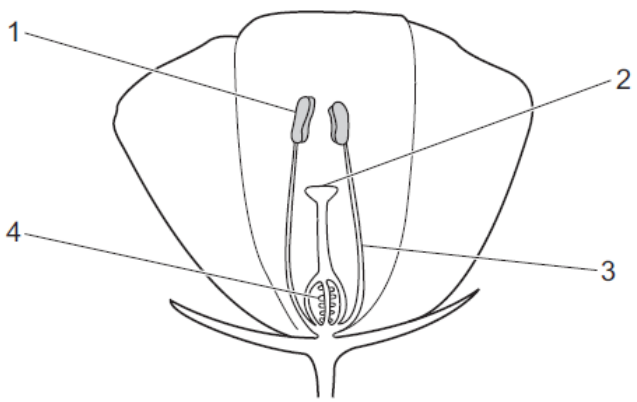
The table shows the conditions that four samples of seeds were kept in.

Which sample would germinate?

	water	oxygen
A	present	absent
B	absent	absent
C	present	present
D	absent	present

2. Nov/2022/Paper_11/No.32

The diagram shows a cross-section of a flower.



During pollination, which labelled structure releases the pollen and which labelled structure receives the pollen?

	releases pollen	receives pollen
A	4	1
B	3	4
C	1	2
D	2	3

3. Nov/2022/Paper_11/No.33

What is a natural method of birth control?

A contraceptive pill

B diaphragm

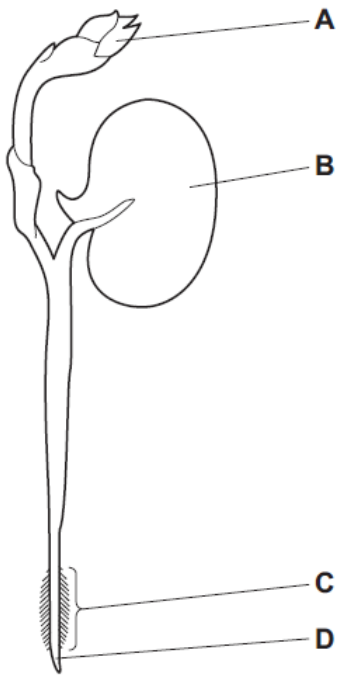
C monitoring cervical mucus

D vasectomy

4. Nov/2022/Paper_12/No.17

The diagram shows a bean seedling soon after it has germinated.

Where is most water absorbed?



5. Nov/2022/Paper_12/No.30

What occurs during fertilisation?

A fusion of two gamete nuclei

B fusion of two zygote nuclei

C splitting of a gamete nucleus

D splitting of a zygote nucleus

6. Nov/2022/Paper_12/No.31

Which hormone causes the development of secondary sexual characteristics in human males?

A adrenaline

B insulin

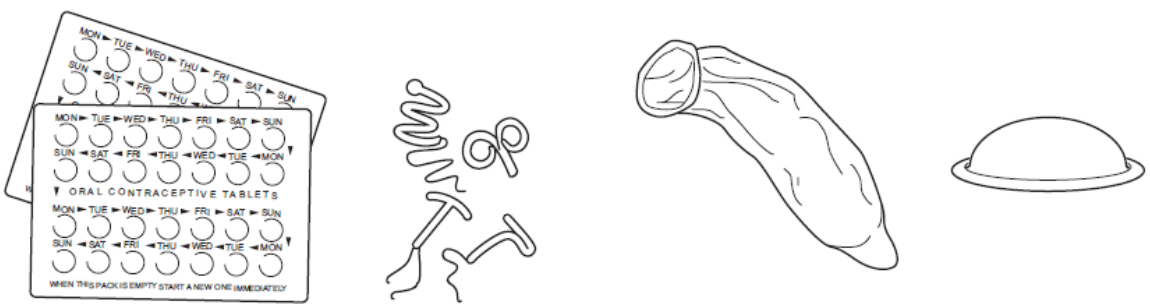
C progesterone

D testosterone

7. Nov/2022/Paper_12/No.32

The diagrams show four methods of birth control.

1 2 3 4



not to scale

What are barrier methods of birth control?

	1	2	3	4
A	✓	✓	✗	✗
B	✗	✓	✓	✗
C	✗	✗	✓	✓
D	✗	✓	✗	✓

key

✓ = yes

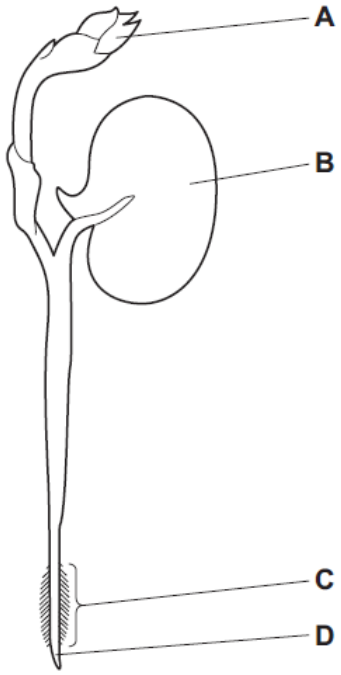
✗ = no

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8. Nov/2022/Paper_13/No.17

The diagram shows a bean seedling soon after it has germinated.

Where is most water absorbed?



9. Nov/2022/Paper_13/No.30

What is a possible order of events during labour and birth?

	1st	2nd	3rd	4th
A	delivery of the afterbirth	baby passes through the vagina	amniotic sac breaks	cervix dilates
B	baby passes through the vagina	umbilical cord is cut	amniotic sac breaks	uterus muscles begin to contract
C	uterus muscles begin to contract	cervix dilates	amniotic sac breaks	baby passes through the vagina
D	uterus muscles begin to contract	baby passes through the vagina	delivery of the afterbirth	cervix dilates

10.

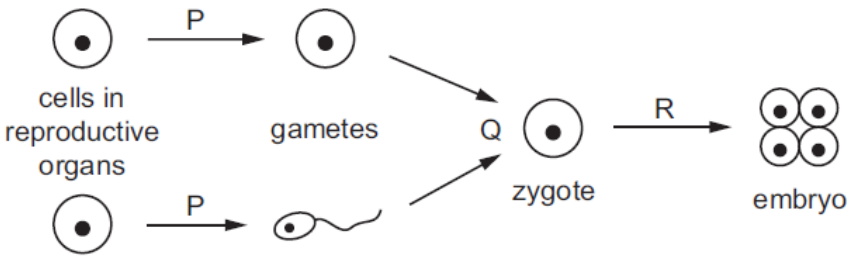
11. Nov/2022/Paper_13/No.32

What is the most effective barrier method of birth control shown in the table?

	method	percentage effectiveness
A	male condom	98
B	diaphragm	95
C	femidom	95
D	vasectomy	99

12. Nov/2022/Paper_13/No.33

The diagram represents processes in sexual reproduction.



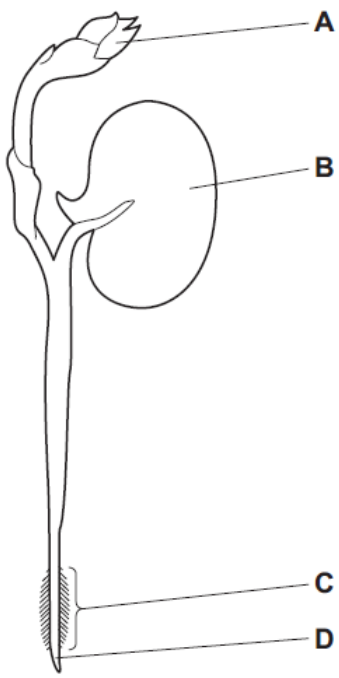
Which processes are represented by the letters P, Q and R?

	P	Q	R
A	meiosis	growth	meiosis
B	meiosis	fertilisation	mitosis
C	mitosis	growth	meiosis
D	mitosis	fertilisation	mitosis

13. Nov/2022/Paper_21/No.15

The diagram shows a bean seedling soon after it has germinated.

Where is most water absorbed?



14. Nov/2022/Paper_21/No.28

The diagram shows a strawberry plant. These plants can reproduce asexually by producing 'plantlets'.



Why is this method of reproduction useful to strawberry farmers?

A Plantlets are produced by meiosis and are genetically different.

B Plantlets are produced by meiosis and are genetically identical.

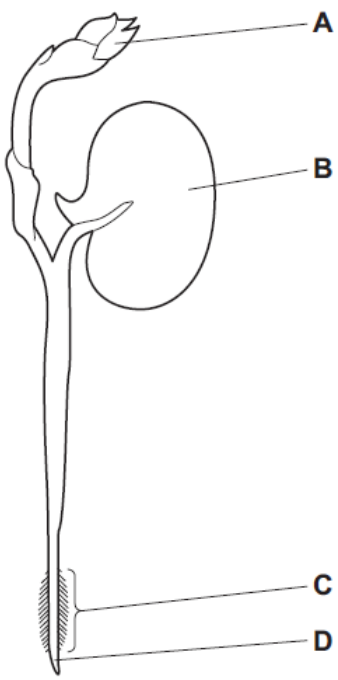
C Plantlets are produced by mitosis and are genetically different.

D Plantlets are produced by mitosis and are genetically identical.

15. Nov/2022/Paper_22/No.15

The diagram shows a bean seedling soon after it has germinated.

Where is most water absorbed?



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16. Nov/2022/Paper_22/No.28

What is the sequence of events in sexual reproduction in plants?

A growth of pollen tube → fertilisation → pollination

B growth of pollen tube → pollination → fertilisation

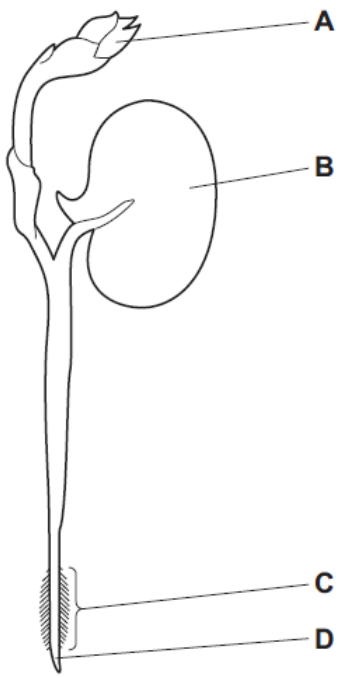
C pollination → fertilisation → growth of pollen tube

D pollination → growth of pollen tube → fertilisation

17. Nov/2022/Paper_23/No.15

The diagram shows a bean seedling soon after it has germinated.

Where is most water absorbed?



18. Nov/2022/Paper_23/No.28

What are advantages of using sexual reproduction to produce crop plants?

1 It produces genetic variation to help breed new varieties of crop plant.

2 It ensures that crops have the identical characteristics.

3 It quickly produces many identical copies of a plant.

A 1, 2 and 3 **B** 1 and 2 only **C** 1 only **D** 2 and 3 only

19. Nov/2022/Paper_23/No.29

Where is the hormone progesterone produced?

1 ovaries

2 placenta

3 uterus

A 1 only **B** 1 and 2 only **C** 2 and 3 only **D** 1, 2 and 3

20. Nov/2022/Paper_23/No.30

Which row correctly describes mitosis?

	new cells are genetically identical to the parent cell	duplication of chromosomes occurs	number of chromosomes in a daughter cell compared to the parent cell
A	no	before mitosis	same
B	no	during mitosis	halved
C	yes	before mitosis	same
D	yes	during mitosis	halved

(a) Fig. 3.1 shows the human male reproductive system and part of the excretory system.

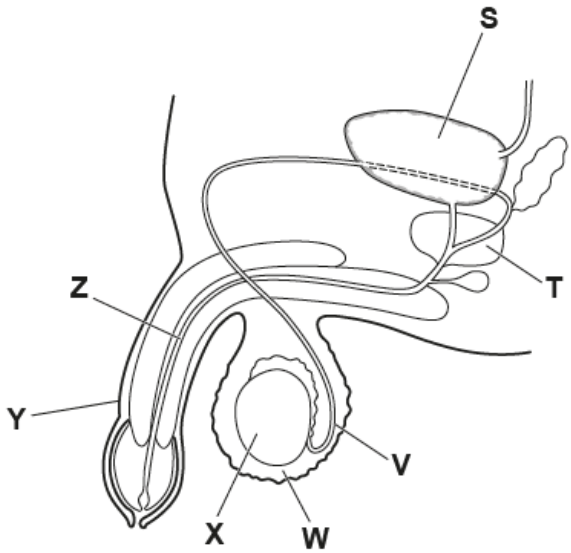


Fig. 3.1

Table 3.1 shows the letters, names and functions of parts from Fig. 3.1.

Complete Table 3.1 using Fig. 3.1.

Table 3.1

letter from Fig. 3.1	name	function
V	.....	carries sperm away from the testis
.....	urethra	carries urine and sperm out of the body
Y	.....	deposits sperm into the vagina
.....	prostate gland	makes the fluid for the sperm to swim in
W	scrotum	....
X	testis	....

[6]

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(b) (i) Table 3.2 shows some of the events (**G** to **M**) that can occur after the sperm leaves the male reproductive system.

Table 3.2

G	an embryo is formed
H	nuclei of the sperm and egg cell fuse
J	sperm enters the oviduct
K	sperm passes through the uterus
L	sperm is deposited into the vagina
M	sperm travels through the cervix

Write the letters of the events in the correct sequence, in the spaces provided.

One has been done for you.

L					

[3]

(ii) State all the possible sex chromosomes that can be found in a sperm cell.

..... [1]

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(c) When a person approaches sexual maturity, secondary sexual characteristics start to develop.

(i) State the name of the hormone that causes the development of secondary sexual characteristics in boys.

..... [1]

(ii) Place ticks (✓) in the correct boxes to identify **three** secondary sexual characteristics that develop in boys.

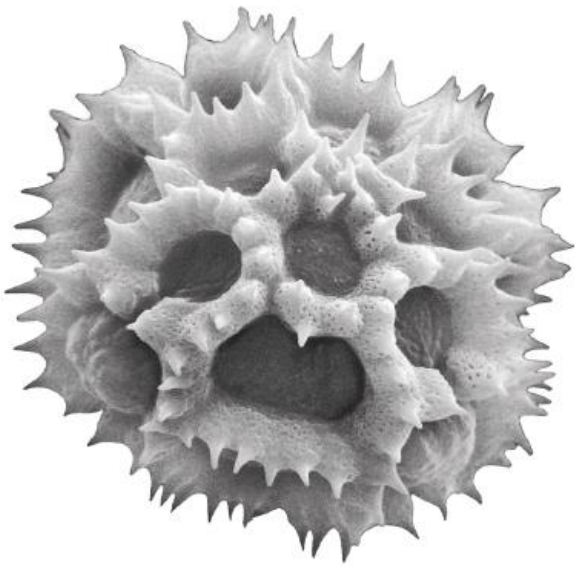
breasts develop	
deepening of the voice	
growth of facial and pubic hair	
menstruation begins	
muscular development	
pelvis widens	

[3]

[Total: 14]

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(a) Fig. 7.1 is a photomicrograph of pollen from an insect-pollinated plant.



magnification ×2500

Fig. 7.1

Describe **two** ways the pollen from a wind-pollinated plant differs from the type of pollen shown in Fig. 7.1.

1 .....

.....

2 .....

.....

[2]

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(b) Fig. 7.2 is a diagram of a section through an insect-pollinated flower.

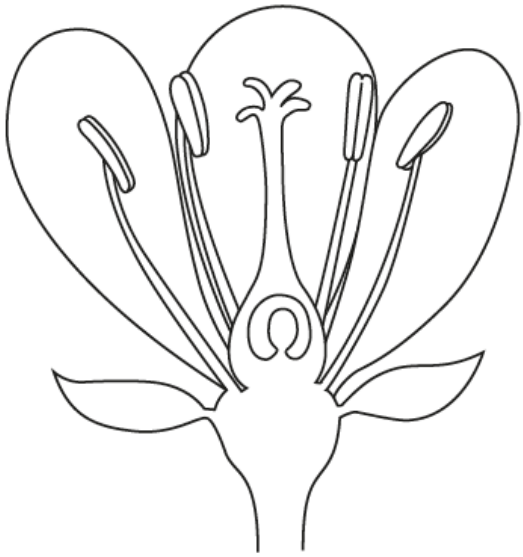


Fig. 7.2

On Fig. 7.2:

- draw an **X** to show where fertilisation occurs
- **circle** the part where pollination occurs
- draw a label line and label the part that produces pollen with the correct name.

[4]

(c) Plants grow from seeds.

State **two** conditions required for the germination of seeds.

1 .....

2 .....

[2]

(d) Xylem tissue is used for transport and support in plants.

Describe how the structure of xylem tissue is adapted for these functions.

.....

.....

.....

.....

.....

.....

..... [3]

[Total: 11]

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23. Nov/2022/Paper_43/No.6

Plants can be classified according to the position and shape of the structures in their flowers.

(a) Fig. 6.1 shows sections of flowers from six different plant species.

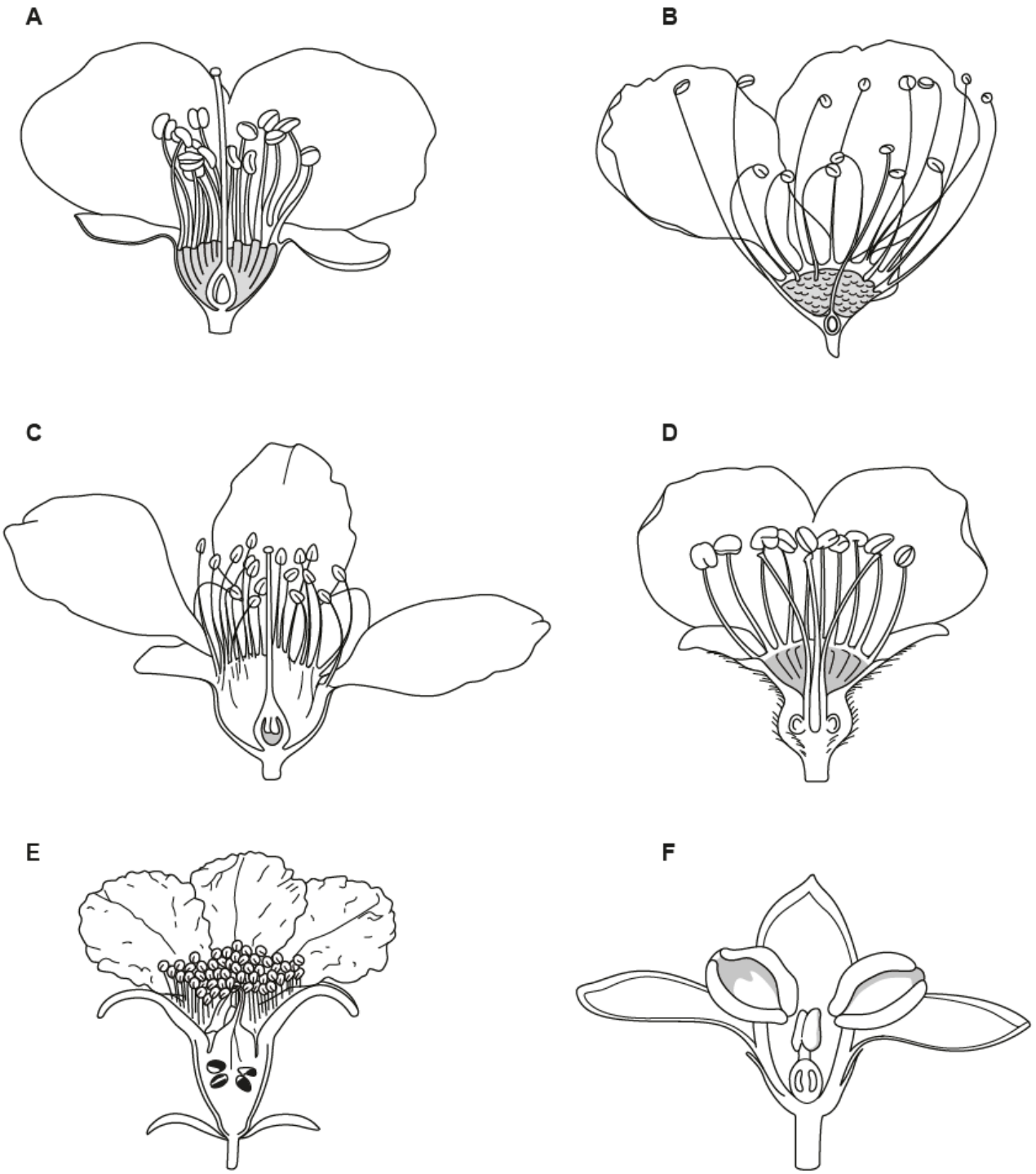


Fig. 6.1

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(i) Use the key to identify each species. Write the letter of each species (**A** to **F**) in the correct box in the key.

key

1(a)	two petals visible	go to 2	
(b)	three petals visible	go to 4	
2(a)	one stigma per flower	go to 3	
(b)	more than one stigma per flower	*Pyrus communis*	
3(a)	stigma higher than anther	*Prunus domestica*	
(b)	stigma at same level or lower than anther	*Prunus salicina*	
4(a)	two ovules visible	go to 5	
(b)	more than two ovules visible	*Punica granatum*	
5(a)	anther smaller than carpel	*Prunus amygdalus*	
(b)	anther larger than carpel	*Olea europaea*	

[4]

(ii) The large petals of the flowers shown in Fig. 6.1 indicate that they are pollinated by insects.

List **four** other structural adaptations of insect-pollinated flowers.

1 .....

2 .....

3 .....

4 .....

[4]

(b) Flowering plants are distinguished from ferns because they all produce flowers.

State **one** other morphological feature that can be used to distinguish flowering plants from ferns.

..... [1]

(c) The fruit of a pear tree, *Pyrus communis*, is often used to make juice.

State what protein biotechnologists will use to increase the volume of juice produced from pear fruit.

..... [1]

[Total: 10]

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Reproduction – 2022 June IGCSE 0610

1. June/2022/Paper_ 11/No.30

What is an example of sexual reproduction?

A one bacterial cell dividing to produce two daughter bacterial cells

B one banana plant being divided into two banana plants

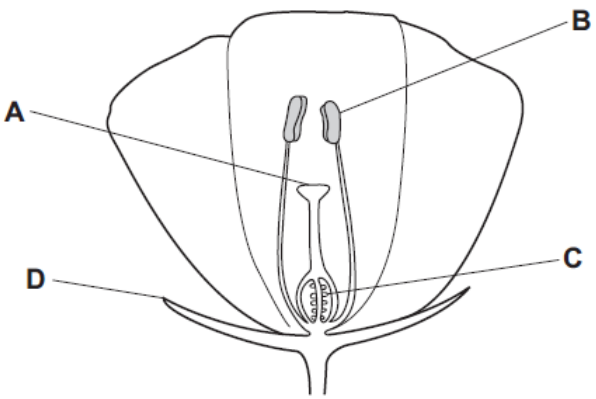
C one pollen grain nucleus fusing with one ovule nucleus in a flower

D one yeast cell producing buds which separate to become new yeast cells

2. June/2022/Paper_ 11/No.31

The diagram shows a cross-section of an insect-pollinated flower.

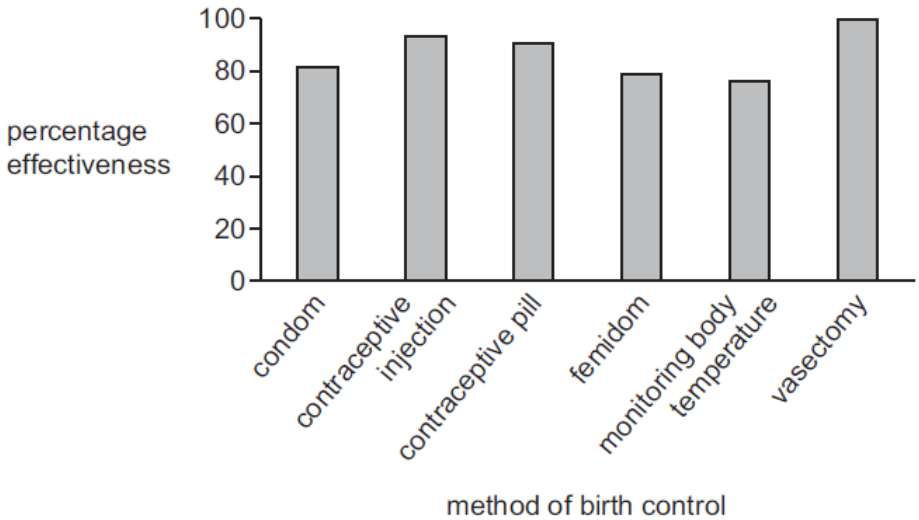
Which label is the stigma?



3. June/2022/Paper_ 11/No.32

The effectiveness of different methods of birth control were studied in one country.

The graph shows the results of the study.



Which type of birth control is the most effective in this study?

A barrier

B chemical

C natural

D surgical

4. June/2022/Paper_ 12/No.30

The statements refer to reproduction.

1 A zygote is formed.

2 Offspring are genetically identical to the parent.

3 Two gamete nuclei fuse together.

Which statements refer to sexual reproduction?

A 1, 2 and 3 **B** 1 and 3 only **C** 1 only **D** 2 and 3 only

5. June/2022/Paper_ 12/No.31

What is the name of the ball of cells that forms soon after fertilisation in humans?

A embryo

B ovum

C placenta

D fetus

6. June/2022/Paper_ 13/No.31

Four processes involved in labour and birth are shown.

1 cutting the umbilical cord

2 contraction of muscles in the uterus wall

3 delivery of the afterbirth

4 dilation of the cervix

5 passage of the baby through the vagina

In which sequence do these events normally occur?

A 2 → 4 → 5 → 1 → 3

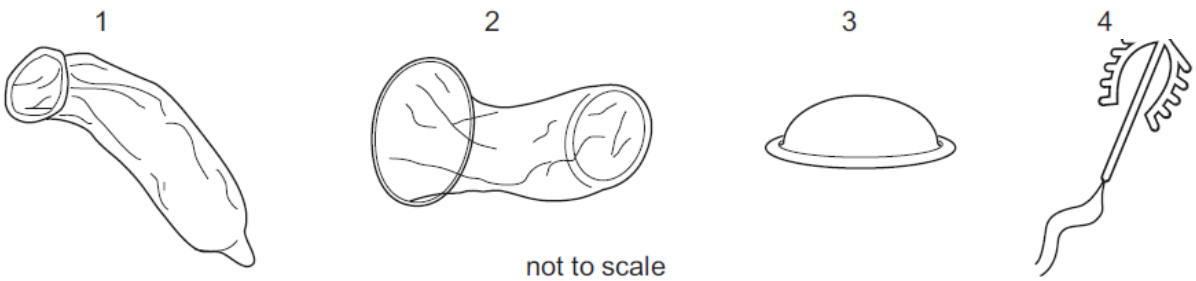
B 2 → 4 → 3 → 1 → 5

C 4 → 3 → 2 → 5 → 1

D 4 → 3 → 2 → 1 → 5

7. June/2022/Paper_ 13/No.32

The diagram shows four types of birth control device.



Which methods of birth control offer protection against sexually transmitted infections (STIs)?

	1	2	3	4
A	✓	✓	✗	✗
B	✗	✓	✓	✗
C	✗	✗	✓	✗
D	✗	✗	✓	✓

key

✓ = yes

✗ = no

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8. June/2022/Paper_ 13/No.33

The table shows the percentage of pregnancies in four groups of women. Each group used a different method of birth control.

method of birth control	percentage of pregnancies
the contraceptive pill	1
monitoring body temperature	14
diaphragm	7
vasectomy	0

Which type of birth control was the **most** effective?

A barrier

B chemical

C natural

D surgical

9. June/2022/Paper_ 21/No.27

An advisor was presented with a list of statements for a discussion group with potential parents who were considering using *in vitro* fertilisation (IVF) to start a family.

Which statements about IVF are correct?

1 IVF is available to everyone.

2 IVF is 100% successful and therefore always leads to pregnancy.

3 IVF provides an opportunity for single parents to have a family.

4 IVF is not expensive and everyone can afford it.

5 Sperm or egg donation may be involved which means the couple are not always the biological parents.

A 1, 3 and 4 **B** 1, 2 and 4 **C** 2 and 5 **D** 3 and 5

10. June/2022/Paper_ 21/No.28

Which sequence of structures does a pollen tube grow through in a flower?

A ovary → ovule → stigma → style

B ovary → stigma → ovule → style

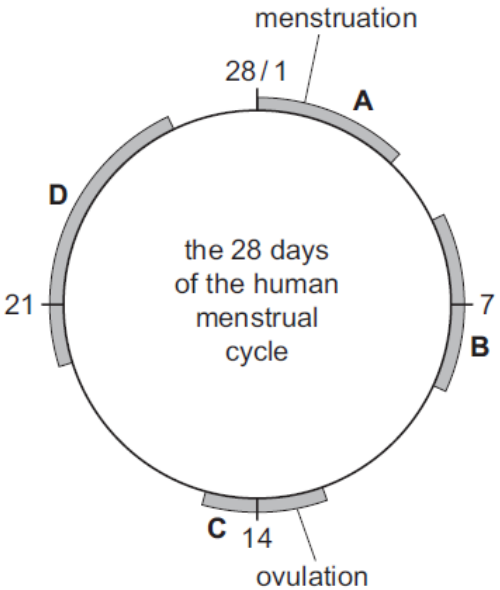
C stigma → style → ovary → ovule

D stigma → ovary → style → ovule

11. June/2022/Paper_ 21/No.29

The diagram shows some of the events of the menstrual cycle.

In which shaded zone of the cycle would progesterone levels be the highest?



12. June/2022/Paper_ 23/No.27

Which statement about asexual reproduction would be a disadvantage for a farmer growing crop plants?

A Desirable qualities are shown throughout the crop.

B No pollinators are required.

C Only one parent plant is required so growth is rapid.

D All of the crop plants have the same risk of disease.

13. June/2022/Paper_ 23/No.28

The diagram shows an abnormal sperm cell.



Why would the abnormal sperm cell be unable to fertilise an egg?

A It has no acrosome so is unable to digest the jelly coat of the egg.

B It has no mitochondria so lacks energy to swim to the egg.

C It has no flagellum so cannot swim to the egg.

D It has no nucleus so cannot fuse with the egg.

14. June/2022/Paper_ 23/No.29

One type of contraceptive pill contains progesterone and oestrogen. Some effects of the pill are listed.

1 inhibit FSH production

2 inhibit LH production

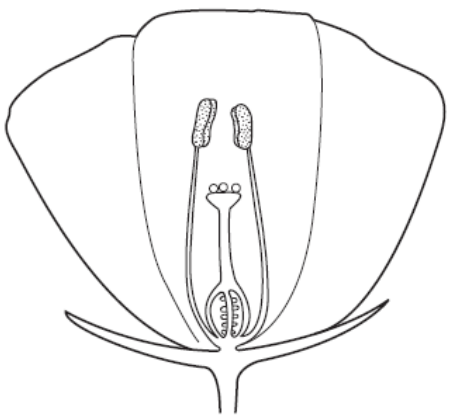
3 inhibit thickening of the uterus wall

Which prevent the development and the release of an egg cell?

A 1, 2 and 3 **B** 1 and 2 only **C** 2 and 3 only **D** 3 only

15. June/2022/Paper_ 23/No.31

The diagram shows a section of a flower that has been cross-pollinated.



Which statements about this flower are correct?

1 The pollen produced by this flower will be genetically different from the pollen on the stigma.

2 The pollen was carried to the stigma by wind.

3 This flower is insect-pollinated because the stigma is enclosed by the petals.

4 The pollen was produced by another flower on the same plant.

A 1, 2 and 4 **B** 1 and 3 **C** 3 only **D** 2 and 4 only

16. June/2022/Paper_ 42/No.2(a_ b)

(a) Fig. 2.1 is a pie chart showing the percentages of the different types of birth control that are used globally.

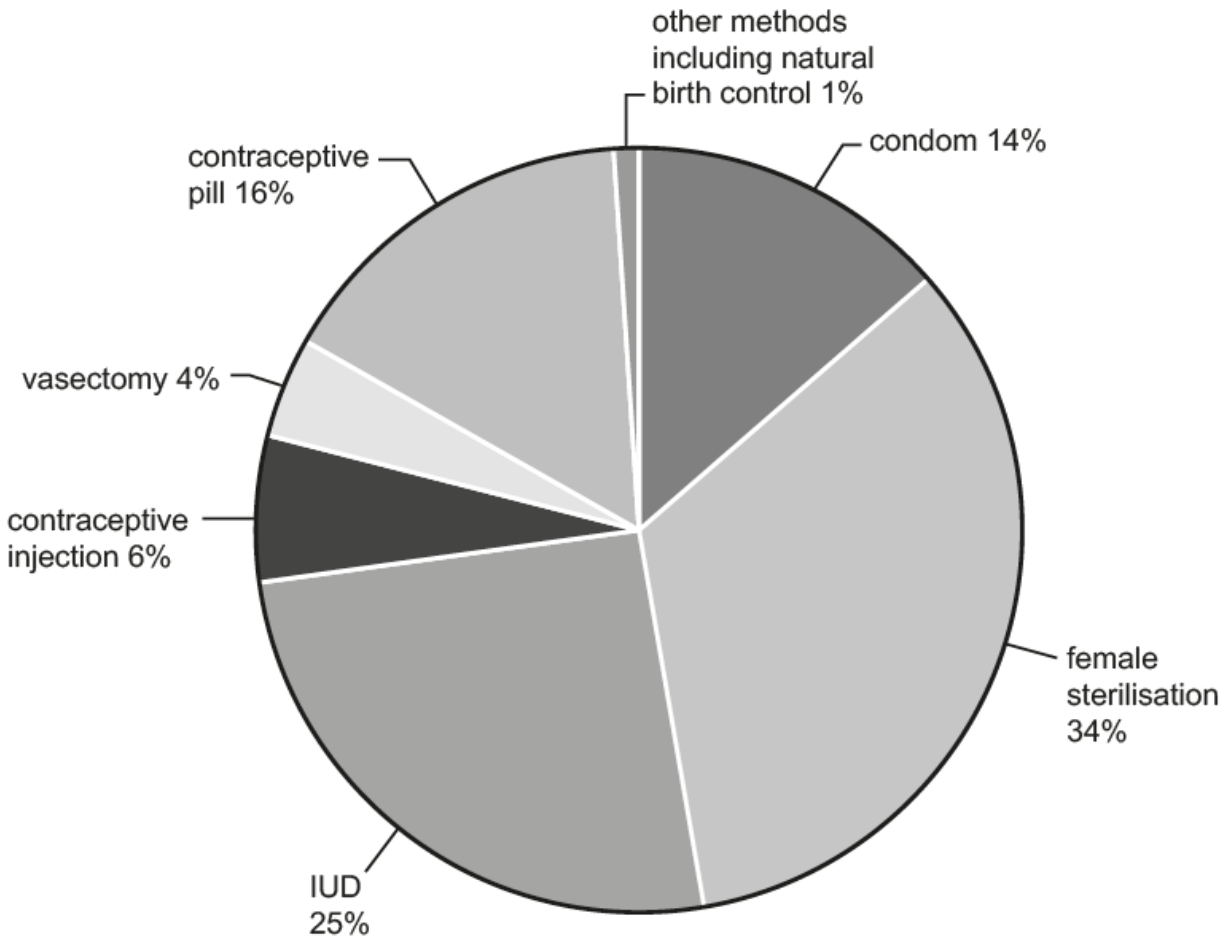


Fig. 2.1

(i) State the most commonly used form of birth control shown in Fig. 2.1.

..... [1]

(ii) State the total percentage using surgical methods of birth control in Fig. 2.1.

..... % [1]

(iii) State **two** forms of natural birth control.

1 .....

2 .....

[2]

(iv) State the type of contraception shown in Fig. 2.1, that also protects against the spread of sexually transmitted infections (STIs).

..... [1]

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(b) HIV infection is an example of an STI.

(i) State the name of the type of pathogen that causes an HIV infection.

..... [1]

(ii) Describe how HIV can be transmitted.

.....

.....

.....

.....

.....

.....

..... [3]

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17. June/2022/Paper_ 42/No.4(a_ c)

(a) Fig. 4.1 is a diagram of the female reproductive system in humans.

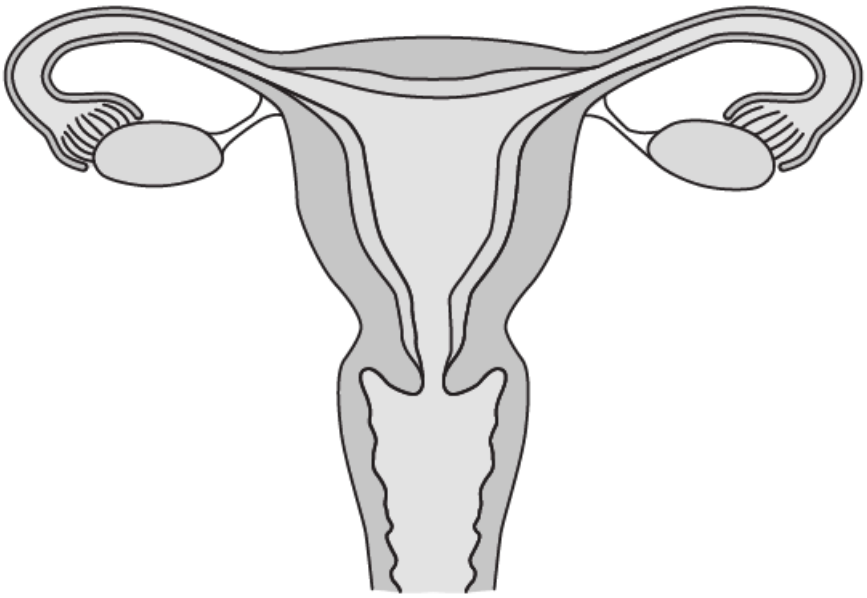


Fig. 4.1

(i) On Fig. 4.1:

- Circle a part that releases egg cells.
- Draw a label line and the letter **W** to show where fertilisation occurs.
- Draw a label line and the letter **X** to show where the fetus develops.

[3]

(ii) State the name of the process that produces egg cells.

..... [1]

(iii) State the names of **two** parts of the female reproductive system that sperm must pass through to reach the egg cell.

1 .....

2 .....

[2]

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(b) Fig. 4.2 is a graph showing the changes in the thickness of the uterus lining during a menstrual cycle.

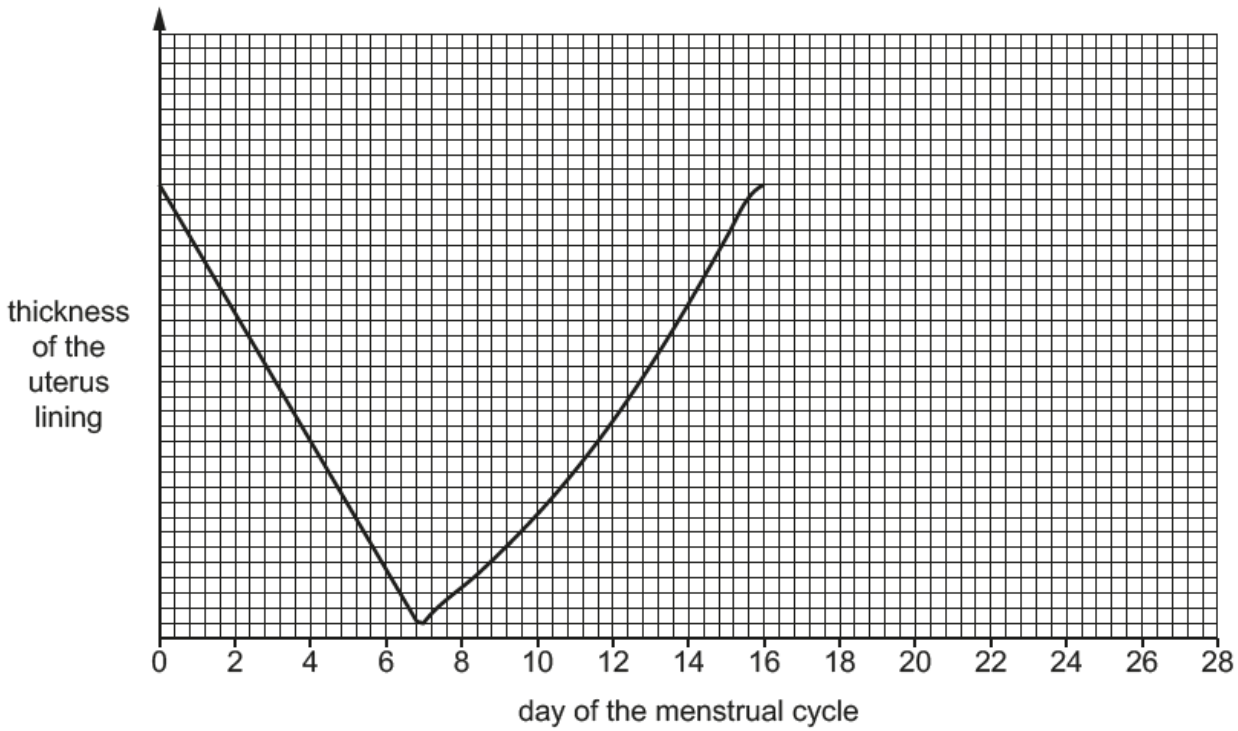


Fig. 4.2

(i) Use the information in Fig. 4.2 to state the number of days during which the uterus lining is shed.

..... [1]

(ii) Draw a line to complete the graph in Fig. 4.2 to show the thickness of the uterus lining between day 16 and 28. [1]

(iii) State the day of the menstrual cycle when eggs are released.

..... [1]

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(c) The menstrual cycle is one of the changes that happens to girls during puberty.

Describe the changes that occur in boys during puberty.

.....

.....

.....

.....

.....

.....

..... [3]

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18. June/2022/Paper_ 42/No.6

Fig. 6.1 is a photograph of a section through a flower.

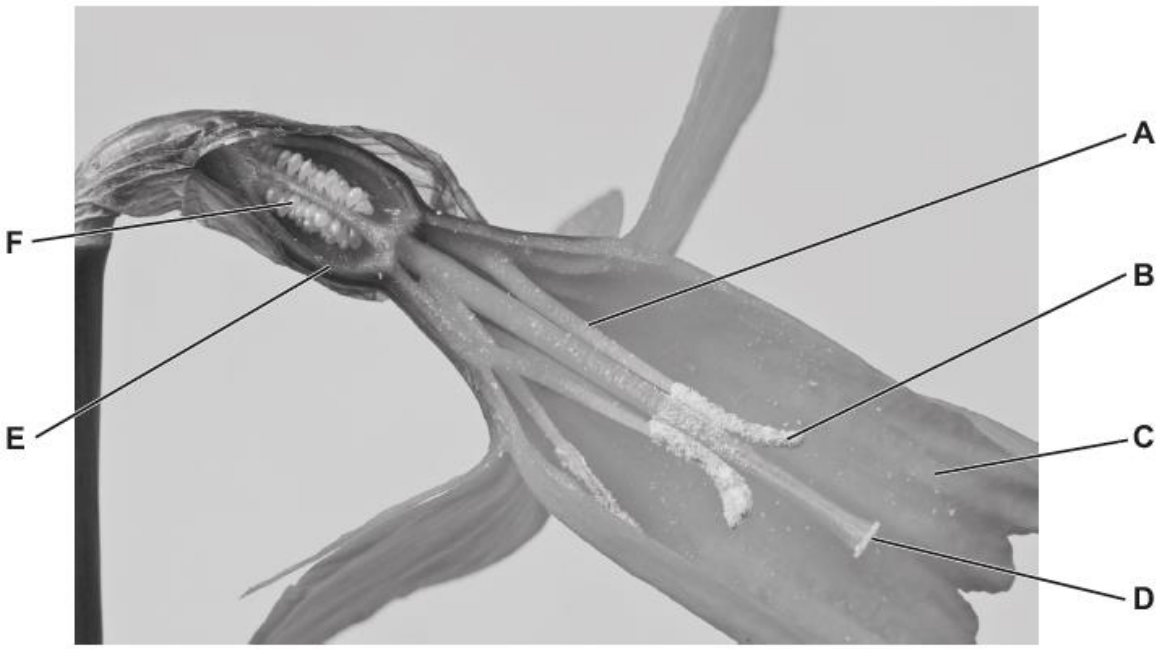


Fig. 6.1

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(a) **(i)** State the names of the parts labelled **A**, **C** and **E** in Fig. 6.1.

A .....

C .....

E .....

[3]

(ii) State the function of the part labelled **B** in Fig. 6.1.

.....

..... [1]

(iii) State the letter of the part in Fig. 6.1 where pollination occurs.

..... [1]

(b) State **one** piece of evidence from Fig. 6.1 that shows this is an insect-pollinated flower.

.....

.....

..... [1]

(c) Describe the adaptations of the flower structure **and** pollen in a wind-pollinated flower.

.....

.....

.....

.....

.....

.....

..... [3]

(d) Living organisms are classified into kingdoms. The organism shown in Fig. 6.1 belongs to the plant kingdom.

State the name of **one** other kingdom.

..... [1]

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19. June/2022/Paper_ 33/No.3

During puberty, the hormones oestrogen and testosterone are involved in the development of the secondary sexual characteristics.

(a) (i) State the name of the gland that produces each hormone.

oestrogen .....

testosterone .....

[2]

(ii) Complete Table 3.1 by placing ticks (✓) in the boxes to show which hormones are involved in the development of each secondary sexual characteristic.

Table 3.1

secondary sexual characteristic	testosterone	oestrogen
body shape changes		
breast development		
facial hair		
voice deepening		

[4]

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(b) Fig. 3.1 is a diagram of the uterus during pregnancy.

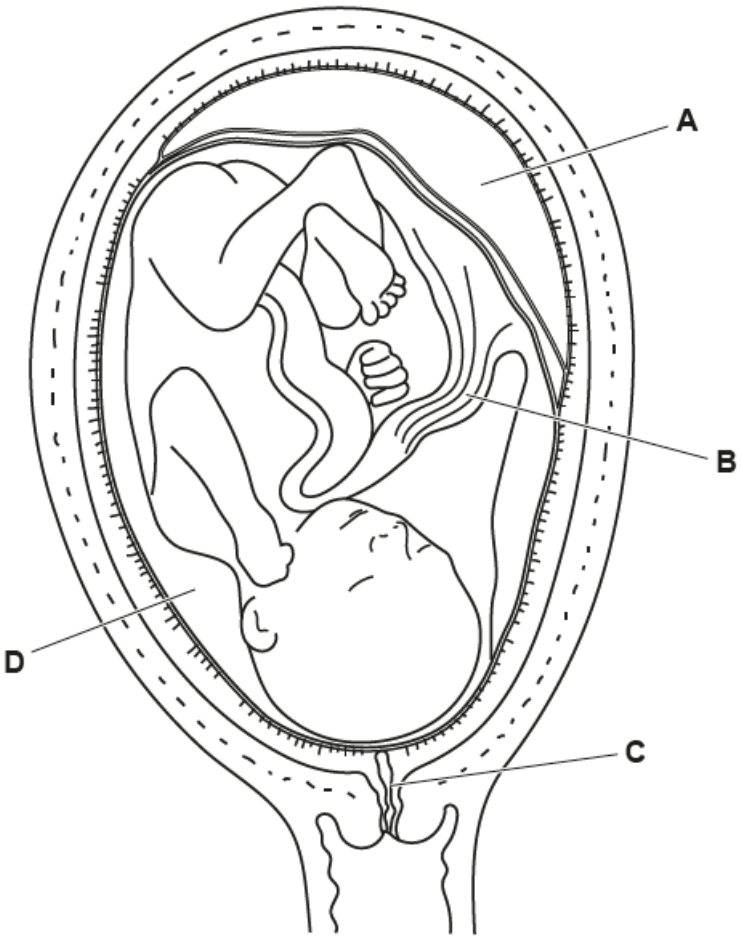


Fig. 3.1

State the letter on Fig. 3.1 that identifies the structure which performs each of these functions.

- exchange of substances between the fetus and the mother .....
- protects the fetus from mechanical shock .....
- transfers blood between the fetus and the placenta .....

[3]

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(c) Outline the processes involved in labour and birth.

.....

.....

.....

.....

.....

.....

.....

.....

..... [4]

(d) The birthweights of 75 rats were measured and recorded within different birthweight ranges.

The number of rats in each birthweight range is recorded in Table 3.2.

Table 3.2

birthweight / g	number of rats
5.5–5.9	8
6.0–6.4	11
6.5–6.9	13
7.0–7.4	18
7.5–7.9	15
8.0–8.4	8
8.5–8.9	2

(i) State the most common birthweight range in Table 3.2.

..... [1]

(ii) State the number of rats that are heavier than 6.9 g at birth in Table 3.2.

..... [1]

(iii) State the type of variation shown by the data in Table 3.2.

..... [1]

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(c) Gametes are involved in sexual reproduction.

Fig. 7.2 is a diagram of human gametes.

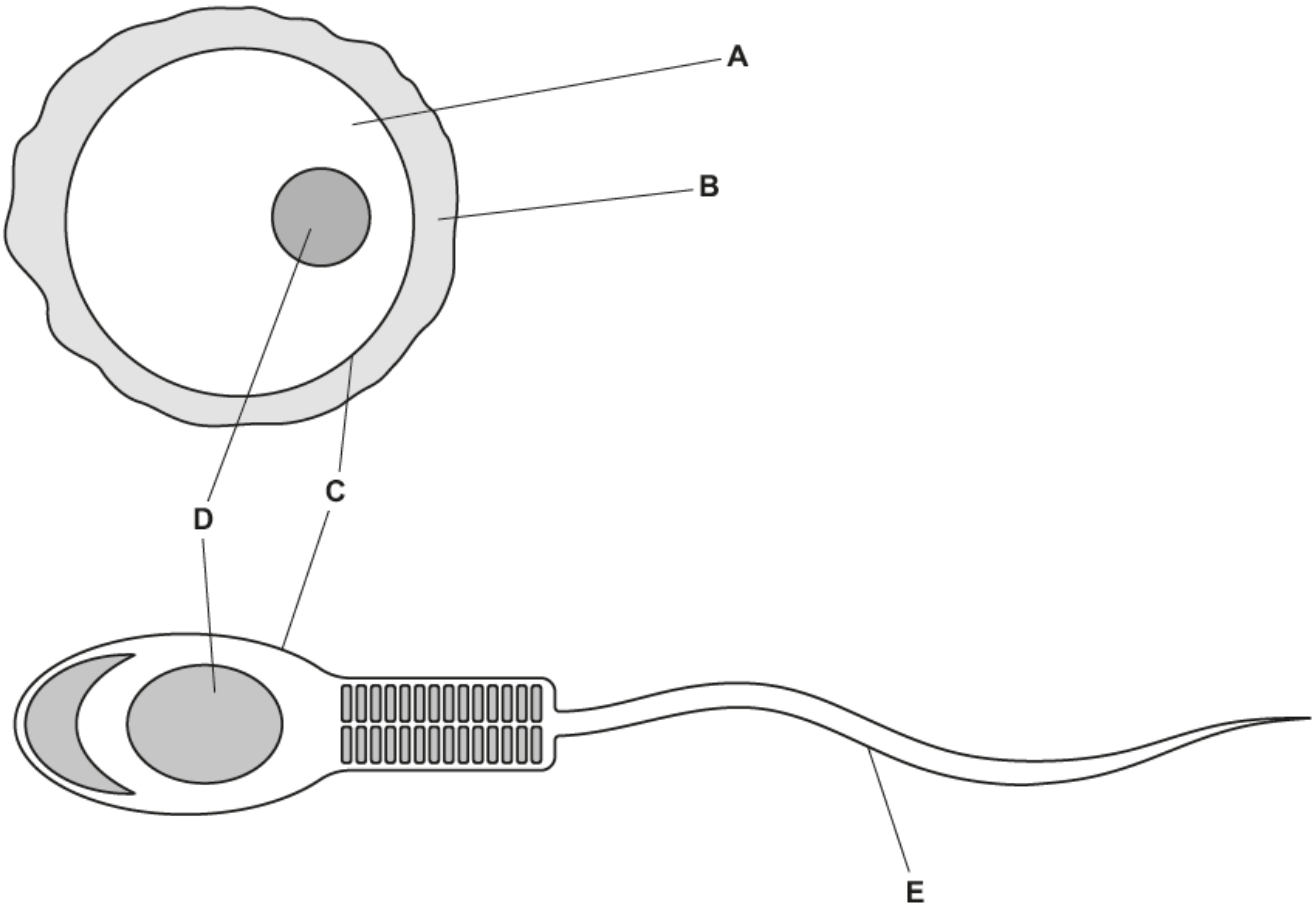


Fig. 7.2

(i) State the names of structures **A**, **B**, **C**, **D** and **E** shown in Fig. 7.2.

A .....

B .....

C .....

D .....

E .....

[5]

(ii) Suggest a type of biological molecule that could be used as an energy store in an egg cell.

..... [1]

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21. June/2022/Paper_ 41/No.5(a_ c)

The Mulanje cedar, *Widdringtonia whytei*, is the national tree of Malawi. This species of tree grows naturally only on Mount Mulanje in Malawi. Many of the trees have been overharvested or destroyed by wildfires, resulting in deforestation, as shown in Fig. 5.1.



Fig. 5.1

(a) State the genus name of the Mulanje cedar tree.

..... [1]

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(b) Explain the undesirable effects of deforestation on habitats that are on mountains, such as Mount Mulanje.

.....

.....

.....

.....

.....

.....

..... [3]

(c) Scientists in Malawi are working to prevent the extinction of the Mulanje cedar tree in its natural habitat.

Explain the benefits to other organisms on Mount Mulanje of conserving the Mulanje cedar tree in its natural habitat.

.....

.....

.....

.....

..... [2]

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Reproduction – 2021 IGCSE 0610

1. Nov/2021/Paper_11/No.30

Which is an example of sexual reproduction?

A a female insect laying unfertilised eggs that develop into new insects

B division of a single-celled bacterium to produce two new bacteria

C fusion of a pollen grain nucleus with an ovule nucleus to produce a seed

D growing cuttings taken from one plant to produce new, genetically identical plants

2. Nov/2021/Paper_11/No.32

Which type of birth control prevents sperm from entering the vagina?

A contraceptive pill

B diaphragm

C IUD

D vasectomy

3. Nov/2021/Paper_12/No.30

Fertilisation is defined as the fusion of the ……X…… of two gametes to form a ……Y…… .

Which row completes the sentence?

	X	Y
A	alleles	sex cell
B	alleles	zygote
C	nuclei	sex cell
D	nuclei	zygote

4. Nov/2021/Paper_12/No.31

What is the correct description of pollination?

A Pollen grains are transferred from the anther to the ovary.

B Pollen grains are transferred from the anther to the stigma.

C Pollen grains are transferred from the ovary to the stigma.

D Pollen grains are transferred from the stamen to the anther.

5. Nov/2021/Paper_13/No.30

Which statement describes a structural adaptation of wind-pollinated flowers?

A They have long filaments so that the anthers hang outside of the flower.

B They have round, sticky sepals to trap pollen grains.

C Their large petals protect the stigma.

D Their stamens are feathery so there is a large surface area.

6. Nov/2021/Paper_13/No.31

What is the correct order of structures through which human sperm must pass in order to fertilise an egg cell?

A sperm duct → testes → cervix → vagina → urethra → uterus → oviduct

B sperm duct → testes → urethra → vagina → cervix → oviduct → uterus

C testes → sperm duct → urethra → vagina → cervix → uterus → oviduct

D testes → sperm duct → vagina → urethra → uterus → oviduct → cervix

7. Nov/2021/Paper_13/No.32

Which pair of birth control methods are chemical methods of preventing pregnancy?

A cervical mucus and diaphragm

B contraceptive pill and monitoring body temperature

C femidom and vasectomy

D IUD and IUS

8. Nov/2021/Paper_13/No.33

Which process occurs in asexual reproduction?

A fertilisation

B meiosis

C mitosis

D pollination

9. Nov/2021/Paper_21/No.29

Which hormone stimulates the release of an egg from the ovary during the menstrual cycle?

A FSH

B LH

C oestrogen

D progesterone

10. Nov/2021/Paper_22/No.29

Commercial plant growers use asexual reproduction to grow coffee plants which produce crops of coffee beans.

What is a disadvantage of asexual reproduction?

A The coffee beans produced by all of the plants are identical.

B Two parent plants are needed.

C One parent is needed.

D All plants are equally susceptible to the same disease.

11. Nov/2021/Paper_23/No.29

Which statement describes a structural adaptation of wind-pollinated flowers?

A They have long filaments so that the anthers hang outside of the flower.

B They have round, sticky sepals to trap pollen grains.

C Their large petals protect the stigma.

D Their stamens are feathery so there is a large surface area.

(a) Fig. 2.1 shows some of the processes involved in the water cycle.

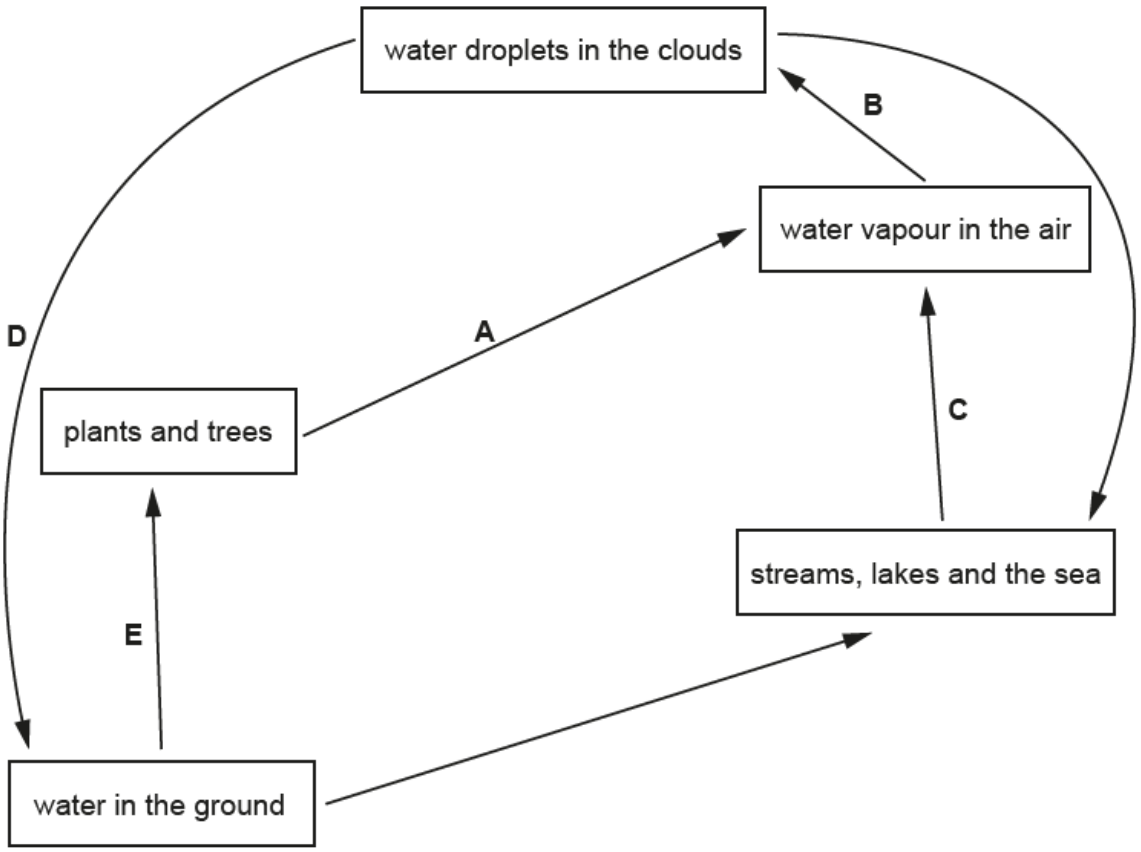


Fig. 2.1

(i) Identify the processes labelled **A** to **D** in Fig. 2.1.

A .....

B .....

C .....

D .....

[4]

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(ii) Describe the process that occurs at **E** in Fig. 2.1.

.....

.....

.....

.....

.....

.....

..... [3]

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(b) Some animals can only live in clean water that has a high concentration of dissolved oxygen.

Some animals can live in polluted water.

A student investigated which animal species lived in different locations in a river.

Fig. 2.2 is a diagram of the river. The numbers are the locations of where the student counted how many of each animal species were present.

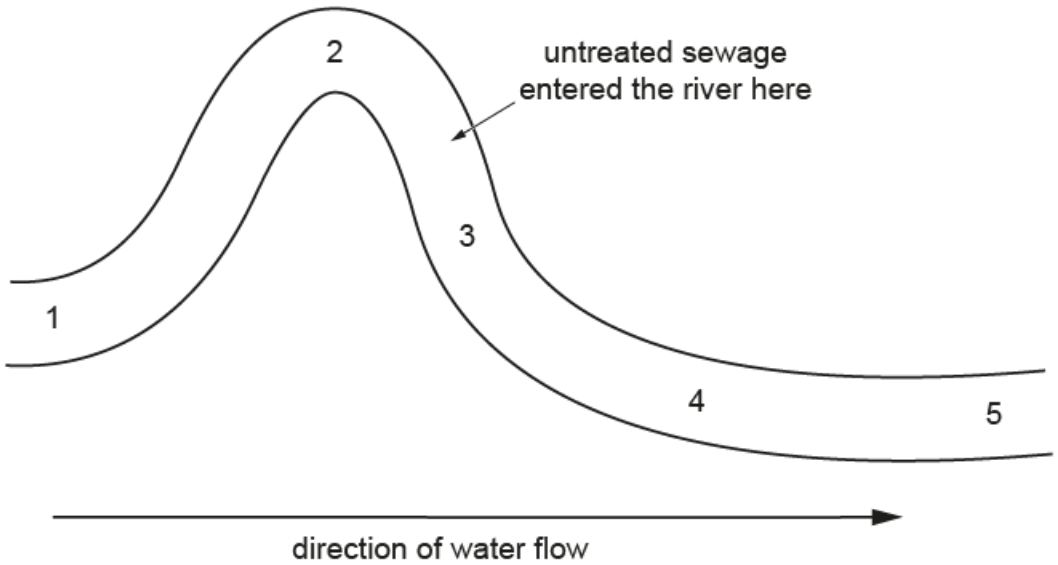


Fig. 2.2

The number of each animal species present is shown in Table 2.1.

Table 2.1

animal species	total number of each animal species found				
	location 1	location 2	location 3	location 4	location 5
mayfly nymph	76	78	0	0	0
freshwater shrimp	70	73	9	17	35
bloodworm	2	1	65	45	16
sludge worm	0	0	111	77	34

(i) State which location has the most animals present.

..... [1]

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(ii) Using the information in Fig. 2.2 and Table 2.1, suggest which animal species is unable to survive in polluted water. Give reasons for your choice.

species .....

reasons .....

.....

.....

.....

.....

.....

[3]

(iii) Suggest which animal species in Table 2.1 indicates that the water is polluted when it is present.

..... [1]

(iv) Calculate the percentage change in the freshwater shrimp numbers between location **2** and location **3**.

Give your answer to **one** decimal place.

Space for working.

..... %

[3]

[Total: 15]

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13. Nov/2021/Paper_32/No.6

(a) Fig. 6.1 shows the changes that happen to the thickness of the uterus lining during the menstrual cycle.

The loss of the lining of the uterus is called menstruation.

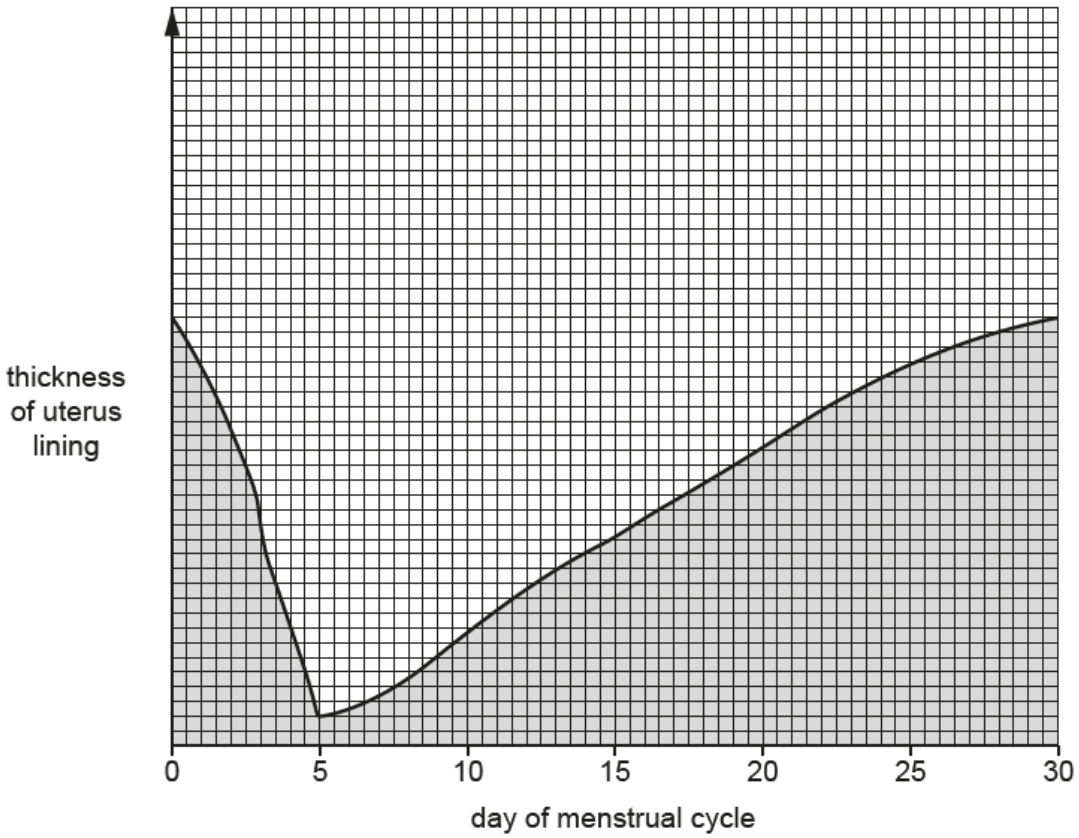


Fig. 6.1

Use Fig. 6.1 and the numbers from the list to answer these questions.

Each number can be used once, more than once or not at all.

0 5 8 15 28 30

State the number of days of this menstrual cycle. .....

State the number of days that menstruation lasts. .....

State the day on which ovulation is most likely to occur. .....

State **one** day when the uterus lining is at its thickest. .....

[4]

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(b) Table 6.1 shows some of the changes that happen to boys and girls during puberty.

Place ticks (✓) in Table 6.1 to show which changes happen in boys and which changes happen in girls.

Table 6.1

	boys	girls
breasts grow		
growth of pubic hair		
widening of hips		

[3]

(c) State the name of the hormone that causes the development of secondary sexual characteristics in girls.

..... [1]

(d) State where the hormone that causes the development of secondary sexual characteristics in boys is produced.

..... [1]

[Total: 9]

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14. Nov/2021/Paper_33/No.4

(a) Fig. 4.1 is a diagram of the female reproductive system.

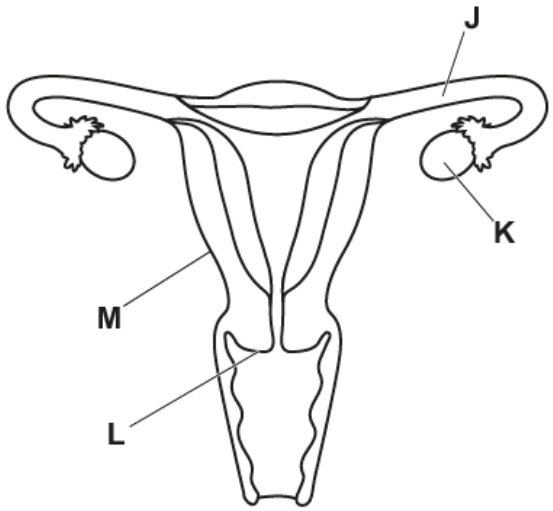


Fig. 4.1

Table 4.1 shows some of the names and functions of the structures labelled with letters **J** to **M** in Fig. 4.1.

Complete Table 4.1.

Table 4.1

letter in Fig. 4.1	name of the structure	function of the structure
J		transfers egg cells to the uterus
K		production of eggs
L	cervix	
M	uterus wall	

[4]

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(b) There are a range of birth control options available to humans. Table 4.2 shows some information about types of birth control.

Complete Table 4.2.

Table 4.2

type of birth control	example of birth control
barrier	
	contraceptive implant
natural	

[3]

[Total: 7]

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15. Nov/2021/Paper_42/No.3

(b) Describe the roles of FSH and LH in the menstrual cycle.

.....

.....

.....

.....

.....

.....

.....

.....

..... [4]

(c) Describe the changes that occur in the lining of the uterus during one menstrual cycle.

.....

.....

.....

.....

.....

.....

..... [3]

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(d) Oral contraceptives are a method of birth control taken by women.

Outline how the hormones in contraceptives act as a method of birth control.

.....

.....

.....

.....

.....

.....

..... [3]

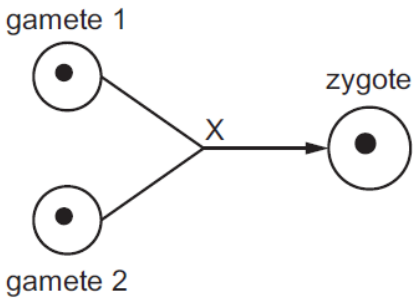
[Total: 14]

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Reproduction – 2021 IGCSE 0610

1. March/2021/Paper_12/No.29

Which process is occurring at X?



A fertilisation

B mitosis

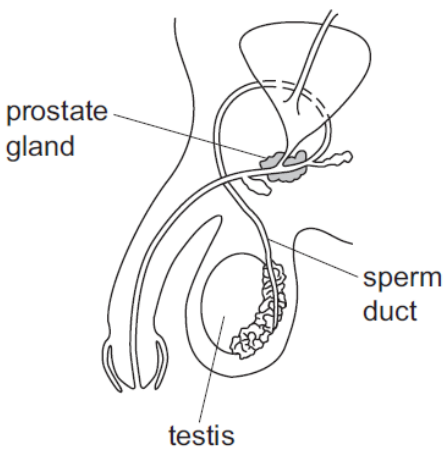
C pollination

D meiosis

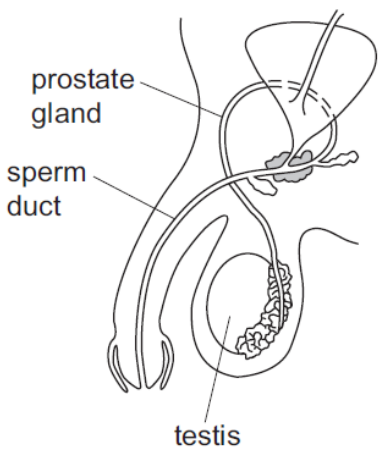
2. March/2021/Paper_12/No.30

Which diagram of the male reproductive system is correctly labelled?

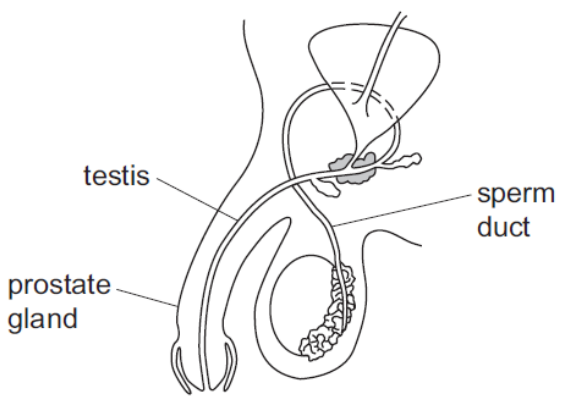
A



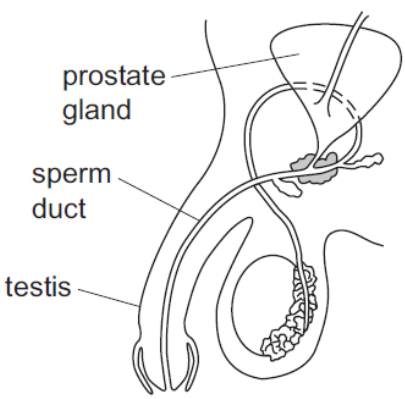
B



C



D



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3. March/2021/Paper_12/No.31

Which method of birth control works by preventing an egg from being released?

A condom

B contraceptive pill

C monitoring body temperature

D vasectomy

4. March/2021/Paper_22/No.29

Some statements about asexual reproduction are listed.

1 Offspring are genetically identical.

2 Offspring are genetically different.

3 Only one parent is required.

4 Two parents are required.

Which statements are correct?

A 1 and 3 **B** 1 and 4 **C** 2 and 3 **D** 2 and 4

5. March/2021/Paper_22/No.30

Which types of contact between humans can spread HIV?

1 blood transfusions

2 sexual intercourse

3 saliva

A 1 and 2 only **B** 1 and 3 only **C** 2 and 3 only **D** 1, 2 and 3

6. March/2021/Paper_22/No.31

Which method of birth control works by preventing an egg from being released?

A condom

B contraceptive pill

C monitoring body temperature

D vasectomy

7. March/2021/Paper_32/No.8

(a) Menstruation is the monthly loss of the lining of the uterus.

The age, in years, when the first menstruation occurred was recorded for one area.

Table 8.1 shows the results.

Table 8.1

age, in years, when the first menstruation occurred	number of females
8	3
9	15
10	62
11	212
12	298
13	251
14	173
15	18
16	11
17	1

(i) State the most common age of first menstruation.

..... [1]

(ii) State the number of females that had their first menstruation at 15 years of age.

..... [1]

(b) Describe what happens to the lining of the uterus during a typical menstrual cycle between:

days 1 to 5 .....

.....

days 8 to 14 .....

.....

[2]

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(c) Describe what happens in the ovary on day 14 in a typical menstrual cycle.

..... [1]

(d) State the name of the hormone that causes the development of secondary sexual characteristics in boys.

..... [1]

(e) State **two** physical changes that occur in males **and** in females during puberty.

1 .....

2 .....

[2]

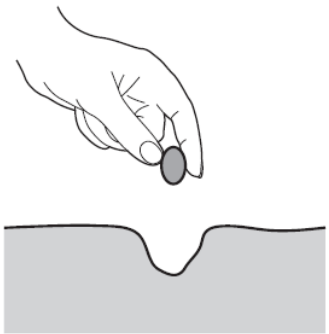
[Total: 8]

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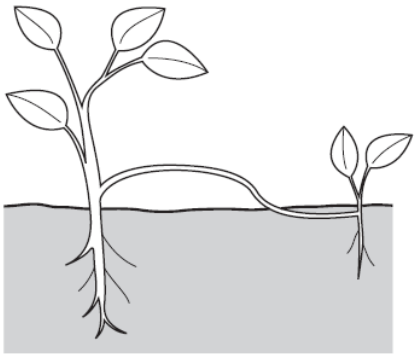
8. June2021/Paper_11/No.30

A gardener wants to produce many genetically identical plants from a single plant.

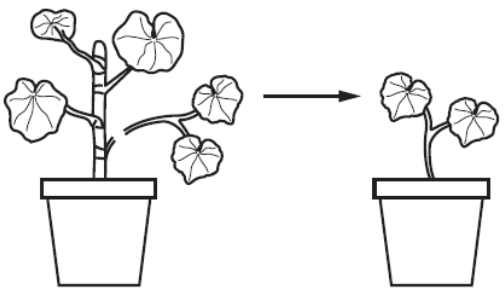
The diagram shows different methods of growing new plants.



1 planting seeds



2 runners



3 stem cuttings

Which methods will produce plants that are genetically identical to the parent plant?

A 1, 2 and 3 **B** 1 and 2 only **C** 1 and 3 only **D** 2 and 3 only

9. June2021/Paper_11/No.31

Which structure in the male reproductive system makes the fluid for sperm to swim in?

A penis

B scrotum

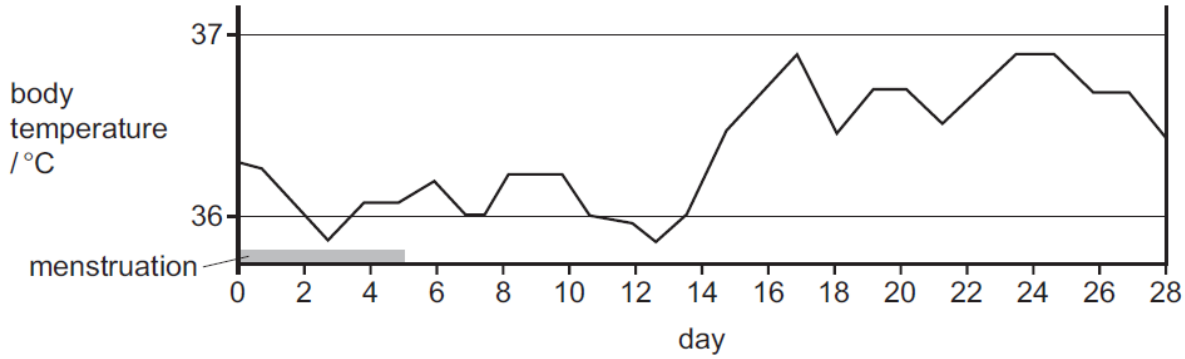
C prostate gland

D testis

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10. June2021/Paper_11/No.32

The graph shows a woman's body temperature during the menstrual cycle.



On which days is the woman **most** likely to become pregnant?

A days 0–5

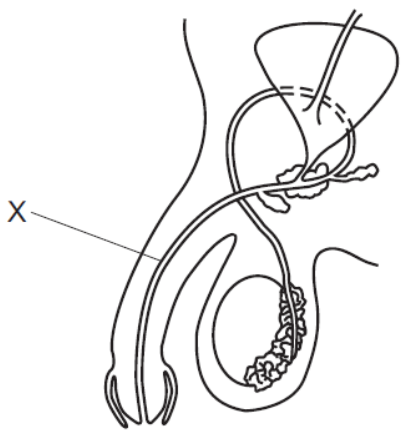
B days 6–12

C days 13–18

D days 19–28

11. June2021/Paper_12/No.30

The diagram shows the male human reproductive system.



What is X?

A bladder

B prostate gland

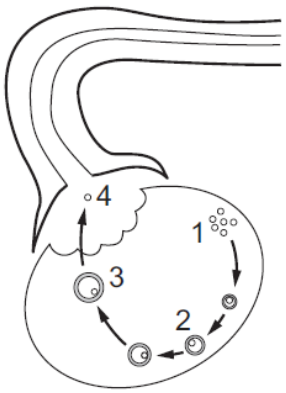
C sperm duct

D urethra

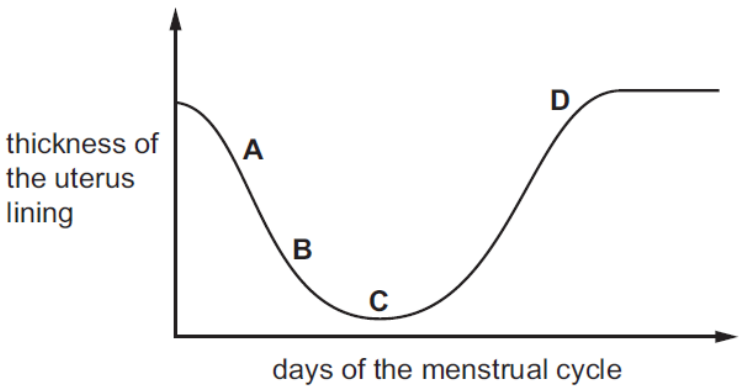
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12. June2021/Paper_12/No.31

The diagram shows changes in the ovary.



Which point represents the thickness of the uterus lining when the ovary is at stage 4?



13. June2021/Paper_13/No.30

Which statement about the process of asexual reproduction is correct?

A It produces genetically different offspring.

B It requires two parents.

C It produces gametes.

D It requires only one parent.

14. June2021/Paper_21/No.30

A zygote has ten chromosomes in its nucleus.

Which row shows the number of chromosomes in the cells of this species?

	body cells	sperm cells	embryo cells
A	5	5	10
B	5	10	20
C	10	5	10
D	10	10	20

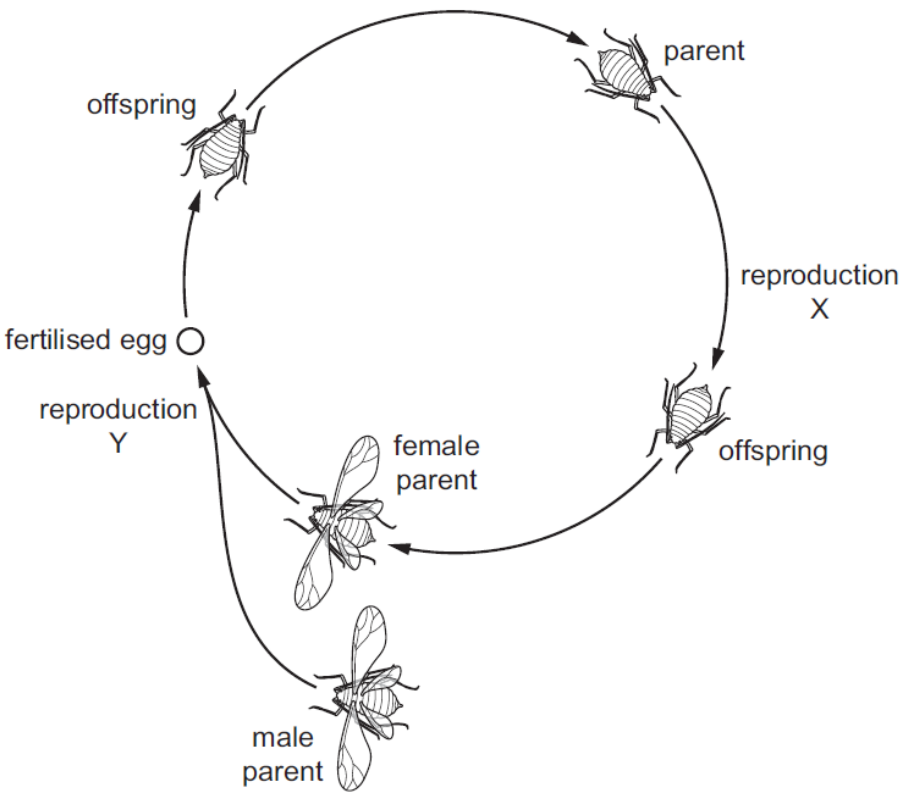
15. June2021/Paper_21/No.31

How will the composition of a pregnant woman's blood change as it passes through the placenta?

	concentration of dissolved oxygen	concentration of urea
A	decreases	decreases
B	decreases	increases
C	increases	decreases
D	increases	increases

16. June2021/Paper_22/No.30

The life cycle of aphids includes both sexual and asexual reproduction.



Which statement is correct?

A X shows asexual reproduction, which produces genetic variation in the offspring.

B Y shows asexual reproduction, which produces genetic variation in the offspring.

C X shows asexual reproduction, which produces genetically identical offspring.

D Y shows asexual reproduction, which produces genetically identical offspring.

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17. June2021/Paper_22/No.31

Modern agricultural methods often use artificial insemination (AI) to breed dairy cattle.

Which statement describes the process of artificial insemination?

A Sperm is collected from a bull and frozen. The sperm is later inserted into the vagina of a cow.

B Eggs are removed from a cow and fertilised using sperm from a bull. The fertilised eggs are reinserted into the uterus of the cow.

C Male and female cows with desired characteristics are chosen to mate.

D Embryos are removed from the uterus of the cow. The embryos are frozen and stored for future use.

18. June2021/Paper_23/No.30

What is a disadvantage of asexual reproduction when a new crop disease appears on a farm?

A Asexual reproduction only requires one parent plant.

B Asexual reproduction does **not** require a pollinator.

C Asexual reproduction does **not** lead to genetic variation in offspring.

D Asexual reproduction does **not** disperse offspring over a wide area.

19. June2021/Paper_23/No.31

Where is progesterone produced in the late stages of pregnancy?

A ovaries

B pancreas

C placenta

D uterus

20. June2021/Paper_31/No.2

(a) Fig. 2.1 is a front view diagram of the male reproductive system in humans.

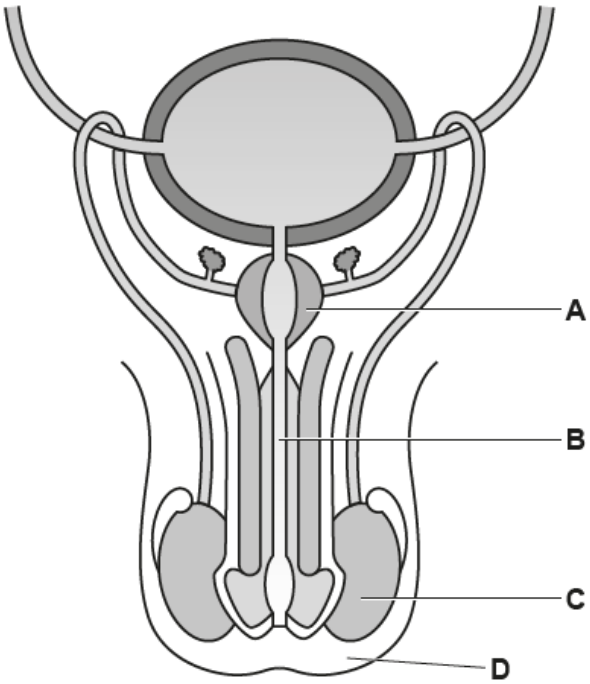


Fig. 2.1

The boxes on the left show the letters identifying the parts in Fig. 2.1.

The boxes on the right show the functions of some of the parts of the male reproductive system.

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Draw lines to link each letter to its function. Draw **four** lines.

letter from Fig. 2.1	function
	gland that secretes fluid for sperm to swim in
A	
	produces sperm
B	
	sac that holds the testes
C	
	tube carrying semen and urine
D	
	tube carrying sperm to urethra

[4]

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(b) Sperm are the male gametes in humans.

(i) State the name of the female gamete in humans.

..... [1]

(ii) State the name of the cell that is formed at fertilisation.

..... [1]

(iii) State the usual site of fertilisation in humans.

..... [1]

(c) The human reproductive system is involved in sexual reproduction.

Compare **asexual** reproduction with **sexual** reproduction.

.....

.....

.....

.....

.....

.....

..... [3]

[Total: 10]

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21. June2021/Paper_32/No.3

(a) Fig. 3.1 is a diagram showing stages during the development of a human embryo and fetus.



Fig. 3.1

(i) Put a tick (✓) in the box that describes a human embryo.

a ball of cells	☐
a cell with energy stores and a jelly coating	☐
a cell with a flagellum	☐
is made of cells that have a cell wall	☐

[1]

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(ii) Table 3.1 shows some of the events (**D** to **J**) that occur between fertilisation and birth.

The events are not in the correct order.

Table 3.1

D	a baby is born
E	complexity of the fetus increases more than size
F	a zygote is formed
G	embryo implants into the wall of the uterus
H	size of the fetus increases more than complexity
J	the zygote divides by mitosis to produce two cells

Put the events into the correct sequence by ordering the letters.

One has been done for you.

	J				

[3]

(b) Complete the sentences using the words and phrases from the list.

Each word or phrase may be used once, more than once or not at all.

afterbirth **amniotic sac** **amniotic fluid** **cervix**

oviduct **penis** **umbilical cord** **uterus wall** **vagina**

Birth begins when the strong muscles of the ..... start to contract. This causes the ..... to dilate. The ..... can break at this stage. The muscles start to push the baby out. The baby moves through the ..... . The ..... is tied and cut. Finally the ..... is delivered.

[6]

[Total: 10]

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22. June2021/Paper_33/No.6

Fig. 6.1 is a section of a flower that has both male and female parts.

Parts of the flower are labelled with the letters **L** to **S**.

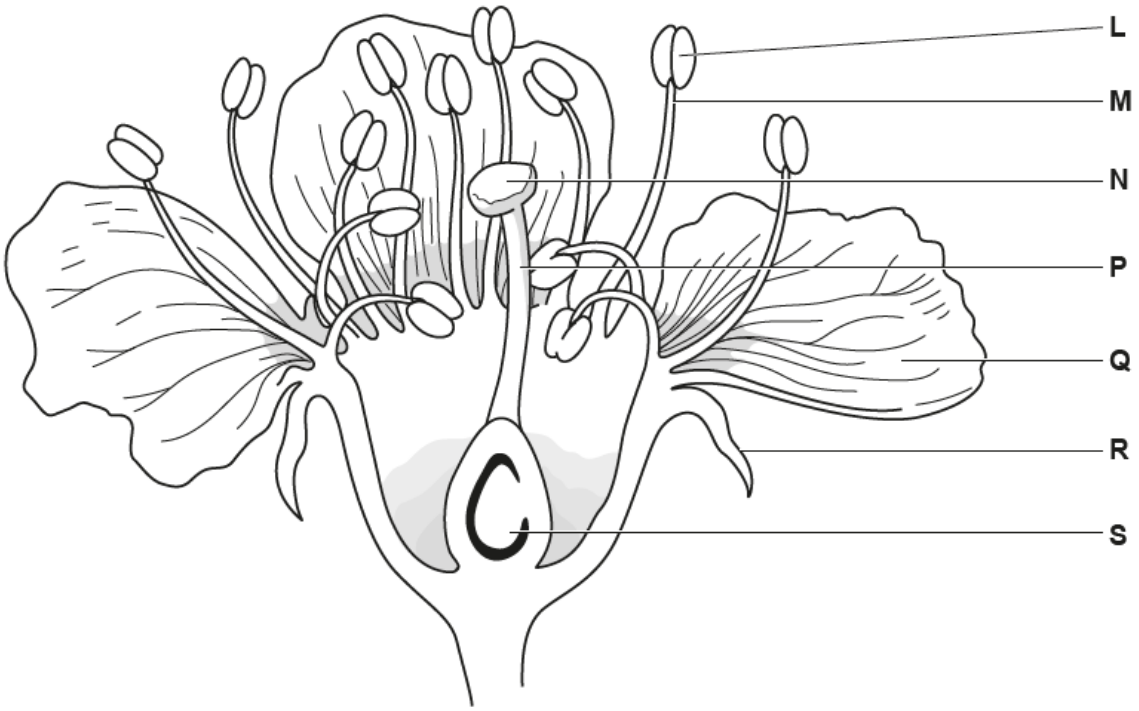


Fig. 6.1

(a) **(i)** Describe a **function** of each of the parts labelled **L**, **N** and **Q**.

L .....

.....

N .....

.....

Q .....

.....

[3]

(ii) State the names of parts **M**, **P**, **R** and **S**.

M .....

P .....

R .....

S .....

[4]

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(b) Fig. 6.2 shows a mature maize plant. Maize plants have separate male and female flowers.

Maize plants are pollinated by the wind.

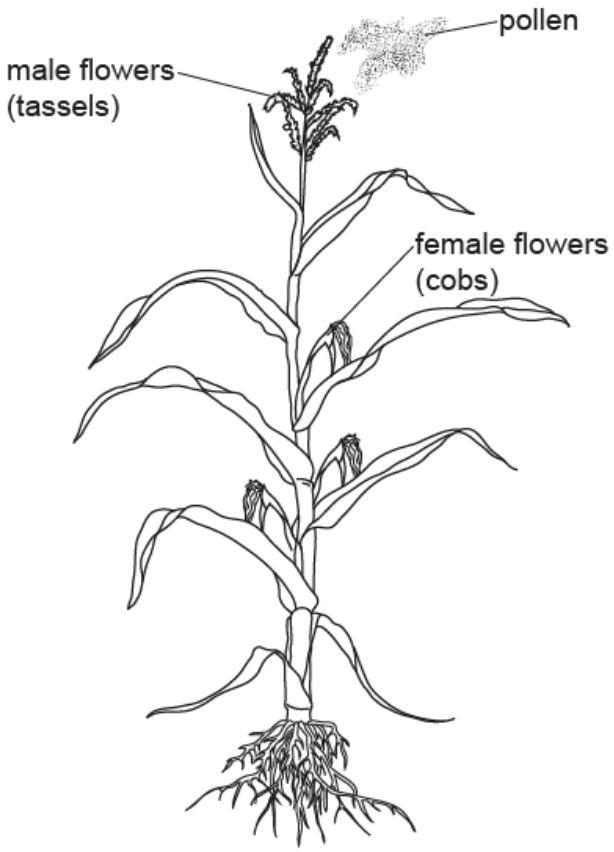


Fig. 6.2

(i) Use the information in Fig. 6.2 to describe how the **position** of the male and female flowers can increase the chance of pollination taking place.

.....

.....

..... [1]

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(ii) Describe **two** ways pollen from an insect-pollinated flower differs from pollen from a wind-pollinated flower.

1 .....

.....

2 .....

.....

[2]

[Total: 10]

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23. June2021/Paper_41/No.5

(a) Fig. 5.1 shows the female reproductive system.

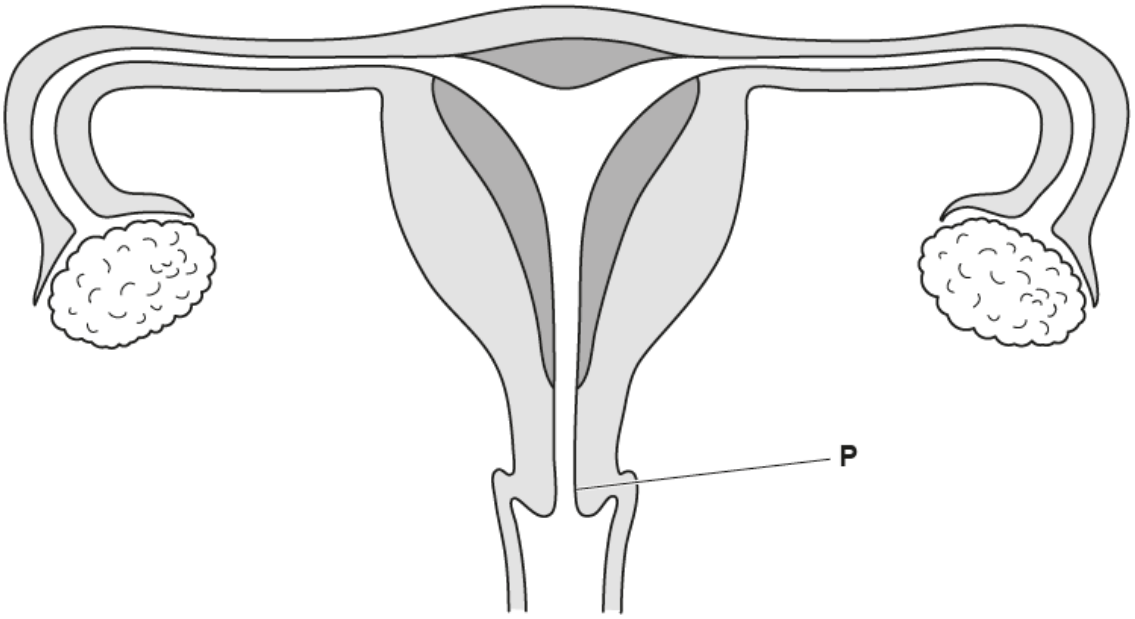


Fig. 5.1

Label Fig. 5.1 using the letters listed to show the position of the organs that are identified by their functions.

The first one (**P**) has been completed for you.

P site of secretion of mucus

Q site of fertilisation

R site of implantation

S site of oestrogen secretion

T site where sperm are deposited during sexual intercourse

[4]

(b) Fig. 5.2 shows a section through an egg cell at the time of ovulation.

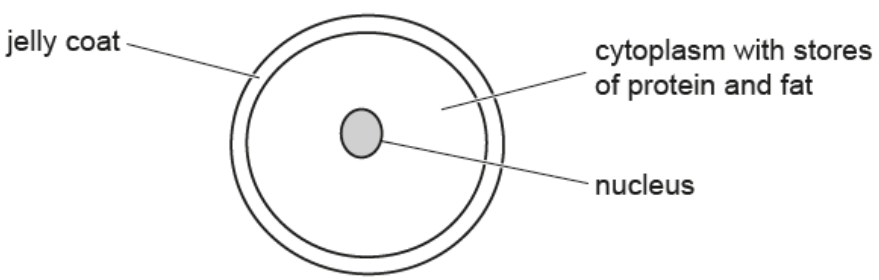


Fig. 5.2

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(i) Explain why the egg cell contains stores of protein and fat.

.....

.....

.....

.....

.....

.....

..... [3]

(ii) Describe the function of the jelly coat.

.....

.....

.....

.....

..... [2]

(c) Fertilisation results in the formation of a zygote.

Describe how an embryo is formed from a zygote.

.....

.....

.....

.....

.....

.....

.....

.....

..... [4]

[Total: 13]

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24. June2021/Paper_42/No.3

(a) Fig. 3.1 shows some of the events that occur in the menstrual cycle.

A	follicle is fully developed
B	gamete is released into the oviduct
C	lining of the uterus is removed from the body
D	lining of the uterus reaches a maximum thickness
E	lining of the uterus gets thicker

Fig. 3.1

(i) Put the events shown in Fig. 3.1 into the correct sequence.

One has been done for you.

		B		

[1]

(ii) State the name of the hormone that stimulates event **A** to occur.

..... [1]

(iii) Event **C** means that menstruating females lose blood regularly.

Two females of the same age have different dietary needs because one has started menstruating and the other has **not** started menstruating.

Suggest why the dietary needs of the two females are different.

.....

.....

.....

.....

..... [2]

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(b) During pregnancy menstruation does not occur.

Fig. 3.2 shows some of the organs of a pregnant woman, viewed from the side.

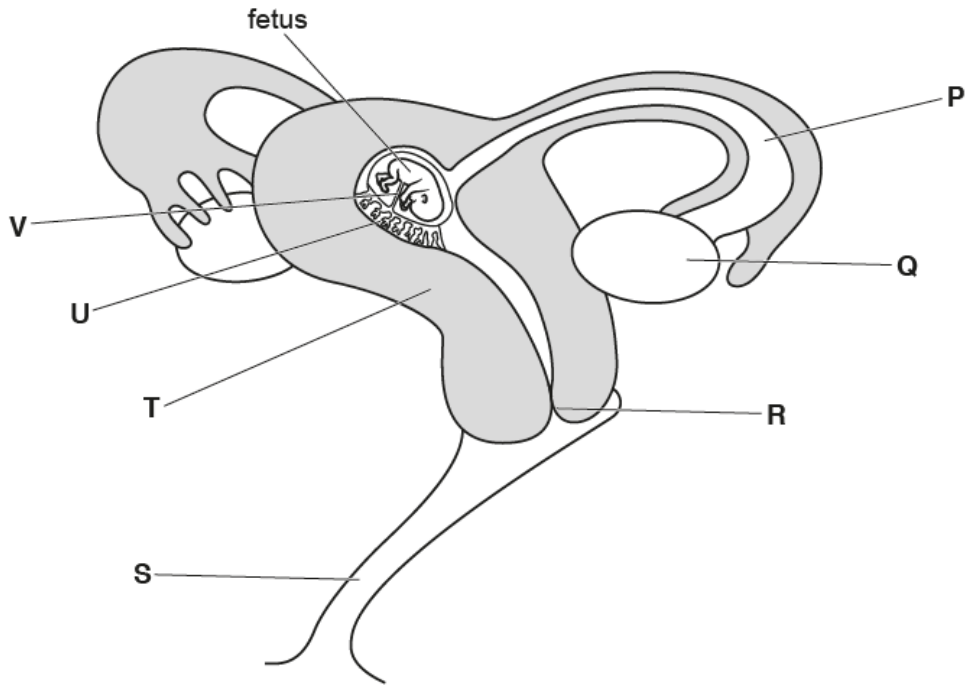


Fig. 3.2

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Describe what happens between ovulation and the formation of a fetus.

Use the letters in Fig. 3.2 to support your answer.

.....

.....

.....

.....

.....

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.....

.....

.....

.....

.....

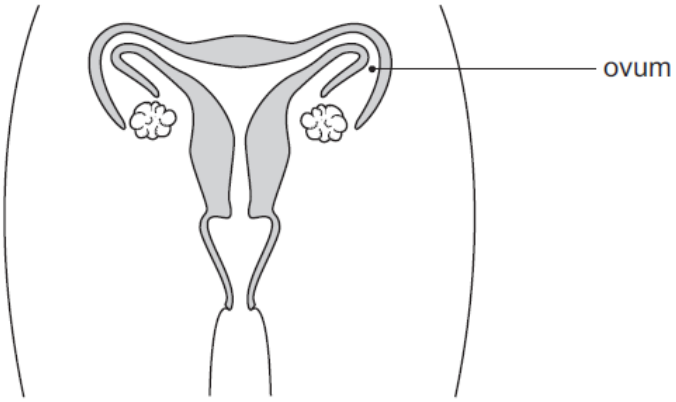
..... [6]

[Total: 10]

Reproduction – 2020 IGCSE 0610

1. Nov/2020/Paper_11/No.5

The diagram shows the female reproductive system.



At which level of organisation are the ovum and the ovary?

	ovum	ovary
A	cell	organ
B	cell	tissue
C	organ	tissue
D	tissue	organ

2. Nov/2020/Paper_11/No.29

What is an example of asexual reproduction?

A a single bacterium dividing to produce two genetically identical bacteria

B a mammal giving birth to four offspring

C a female bird laying six eggs which will hatch into the same species

D a tomato plant producing fruits which contain many seeds

3. Nov/2020/Paper_11/No.30

What is the sequence of events when a woman gives birth?

	1st	2nd	3rd
A	delivery of afterbirth	cervix dilates	passage of fetus through vagina
B	cervix dilates	passage of fetus through vagina	umbilical cord cut
C	passage of fetus through vagina	amniotic sac breaks	cervix dilates
D	umbilical cord cut	passage of fetus through vagina	delivery of afterbirth

4. Nov/2020/Paper_11/No.31

Some types of birth control are listed.

1 condom

2 diaphragm

3 IUD

4 vasectomy

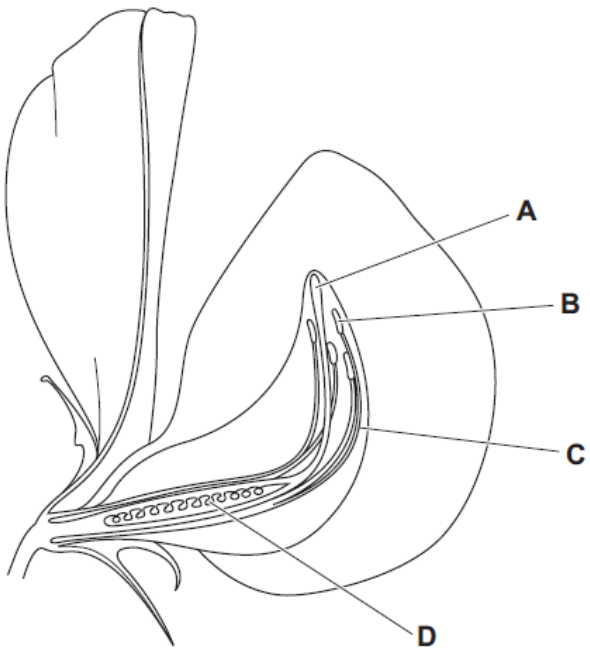
Which types are barrier methods?

A 1, 2 and 4 **B** 1 and 2 **C** 1 only **D** 3 and 4

5. Nov/2020/Paper_12/No.29

The diagram shows a flower cut in half.

Which structure receives the pollen nucleus during fertilisation?



6. Nov/2020/Paper_12/No.30

During childbirth, what must happen to the amniotic sac, cervix and the uterus wall?

	amniotic sac	cervix	uterus wall
A	breaks	contracts	contracts
B	breaks	dilates	contracts
C	expands	contracts	relaxes
D	expands	dilates	relaxes

7. Nov/2020/Paper_12/No.31

What is a barrier method of birth control?

A contraceptive pill

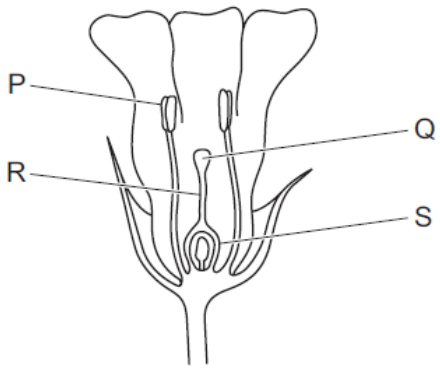
B diaphragm

C contraceptive implant

D vasectomy

8. Nov/2020/Paper_13/No.29

The diagram shows half a flower.

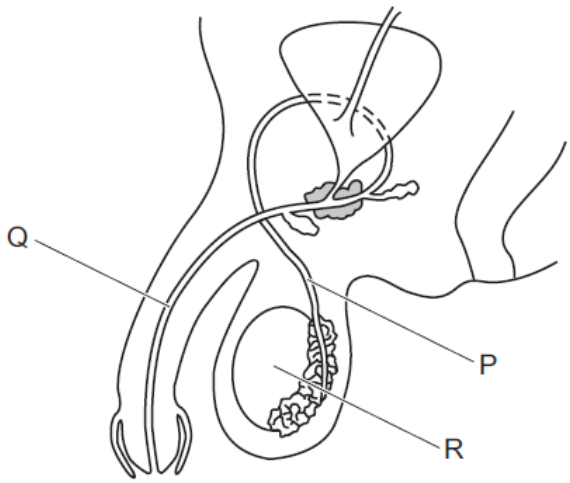


Which row identifies the parts of the flower?

	P	Q	R	S
A	anther	stigma	style	ovary
B	anther	style	stigma	anther
C	style	anther	ovary	style
D	style	ovary	anther	stigma

9. Nov/2020/Paper_13/No.30

The diagram shows the human male reproductive system.



What are structures P, Q and R?

	P	Q	R
A	sperm duct	urethra	testis
B	sperm duct	ureter	testis
C	ureter	penis	sperm duct
D	urethra	penis	testis

10. Nov/2020/Paper_13/No.31

Which method of birth control would also help to protect against HIV?

A condom

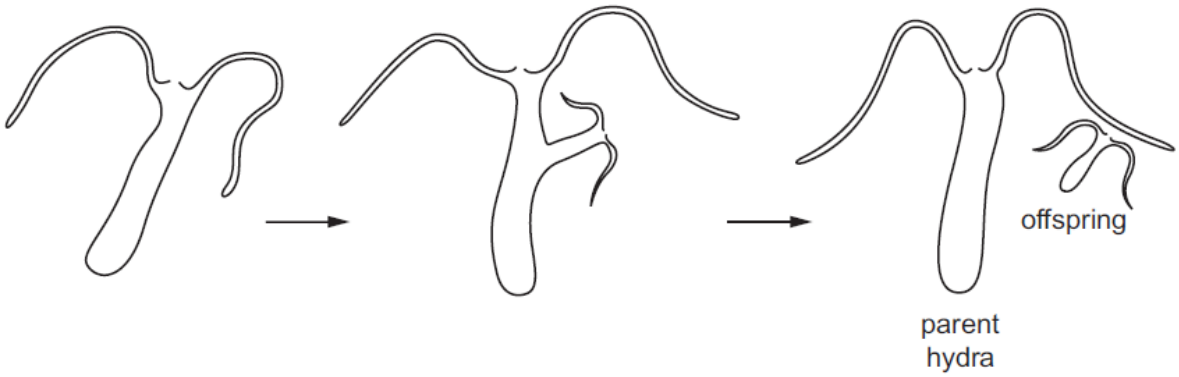
B contraceptive pill

C diaphragm

D IUD

11. Nov/2020/Paper_21/No.27

The diagram shows one parent *Hydra* growing and releasing an offspring from the side of its body.



Which row is correct?

	parent and offspring are genetically identical	involves asexual reproduction
A	✓	✓
B	✓	✗
C	✗	✓
D	✗	✗

key
✓ = yes
✗ = no

12. Nov/2020/Paper_21/No.28

Which row describes self-pollination?

	pollen transferred from anther to stigma of		
	a different flower on the same plant	a flower on a different plant of the same species	same flower
A	✓	✓	✗
B	✓	✗	✓
C	✗	✗	✓
D	✗	✓	✓

key
✓ = yes
✗ = no

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13. Nov/2020/Paper_22/No.27

Some flowers can only be pollinated by specific insect species.

What will happen if none of these insects are present?

A genetically different seed produced

B genetically identical seed produced

C no seed produced

D only small amounts of seed produced

14. Nov/2020/Paper_22/No.28

Which hormone is used in contraceptive pills?

A insulin

B LH

C FSH

D progesterone

15. Nov/2020/Paper_22/No.29

Which hormone causes the lining of the uterus to become thick and glandular before ovulation?

A adrenaline

B FSH

C oestrogen

D progesterone

16. Nov/2020/Paper_23/No.28

Which organ secretes progesterone?

A ovary

B pancreas

C salivary gland

D testis

17. Nov/2020/Paper_23/No.29

Which statement explains why the hormone FSH is used in fertility treatment?

A It causes the formation of a zygote during *in vitro* fertilisation (IVF).

B It stimulates ovulation for artificial insemination (AI).

C It stimulates the production of large numbers of eggs for use in *in vitro* fertilisation (IVF).

D It is used to maintain the uterus wall ready for artificial insemination (AI).

18. Nov/2020/Paper_31/No.7

(a) Pollination occurs when pollen is transferred from one flower to another.

Fig. 7.1 is a diagram of part of a flower.

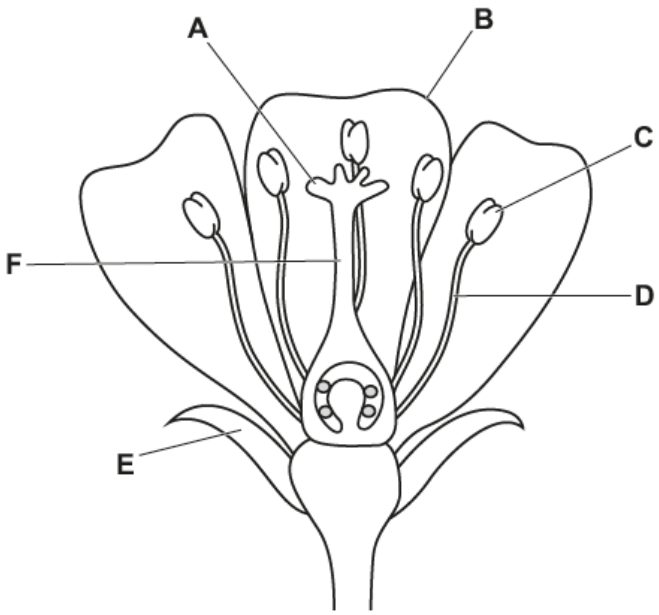


Fig. 7.1

(i) State the letter from Fig. 7.1 that identifies the structure which:

attracts insect pollinators .....

produces pollen .....

receives the pollen during pollination .....

[3]

(ii) Draw a label line and the letter **X on** the flower in Fig. 7.1 to show where fertilisation occurs. [1]

(iii) State the name of the part labelled **E** in Fig. 7.1.

..... [1]

(b) The flower shown in Fig. 7.1 represents an insect-pollinated flower.

Describe **two** ways the pollen from an insect-pollinated flower differs from the pollen from a wind-pollinated flower.

1 .....

.....

2 .....

.....

[2]

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(c) A student wrote an **incorrect** statement about fertilisation in plants.

Fertilisation is the fusion of zygote nuclei.

Circle the incorrect word. [1]

(d) Plants can reproduce asexually or sexually.

Table 7.1 compares asexual and sexual reproduction.

Place ticks (✓) in the boxes to show the correct features of asexual and sexual reproduction.

Table 7.1

features of reproduction	asexual reproduction	sexual reproduction
involves gametes		
makes more of the same kind of organism		
produces genetically identical offspring		
involves fertilisation		

[4]

[Total: 12]

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19. Nov/2020/Paper_32/No.7

Fig. 7.1 shows part of the female human reproductive system.

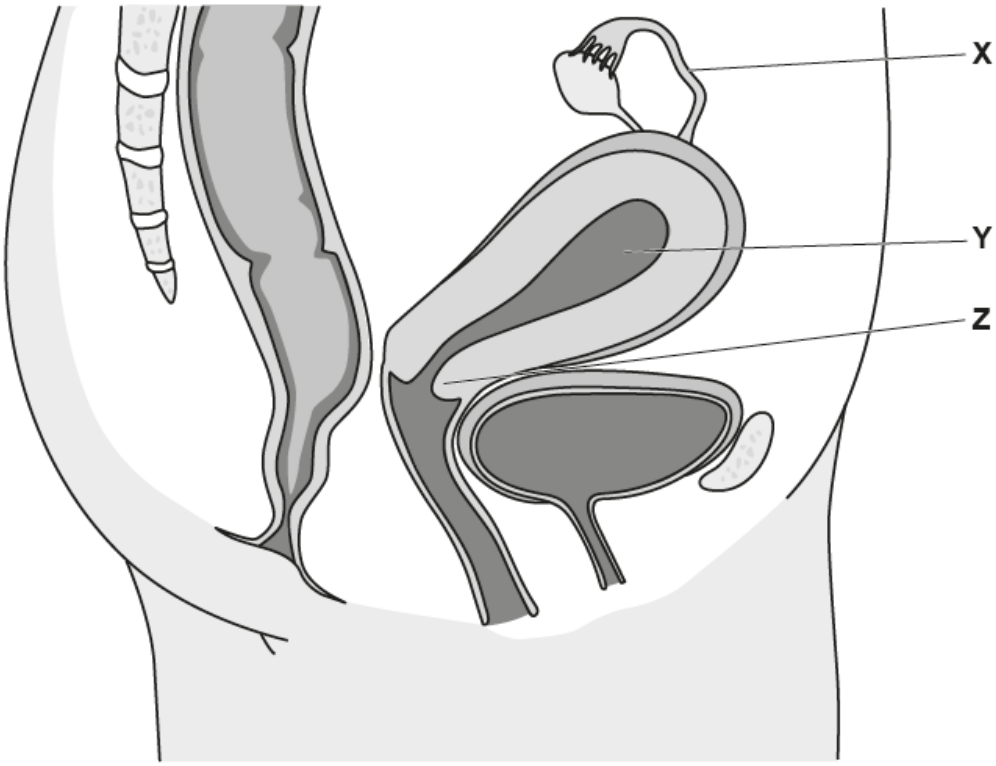


Fig. 7.1

(a) State the names of the structures labelled **X**, **Y** and **Z** on Fig. 7.1.

X .....

Y .....

Z .....

[3]

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(b) The box on the left shows the beginning of a sentence.

The boxes on the right show some endings of sentences.

Draw **three** lines from the word oestrogen to make complete three correct sentences.

Oestrogen	is a hormone.
	is produced in the ovaries.
	makes breasts grow.
	makes hair grow on the chest.
	travels down the oviduct.
	widens the pupils.

[3]

(c) The average menstrual cycle is 28 days.

(i) State the day in an average menstrual cycle when:

ovulation occurs .....

the uterus lining starts to shed .....

the uterus lining is at its thinnest .....

[3]

(ii) Describe **one** change, other than ovulation, that occurs in the ovary during the menstrual cycle.

.....

.....

..... [1]

[Total: 10]

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20. Nov/2020/Paper_41/No.5

(b) Fig. 5.1 shows the changes in the lining of the uterus of a human female.

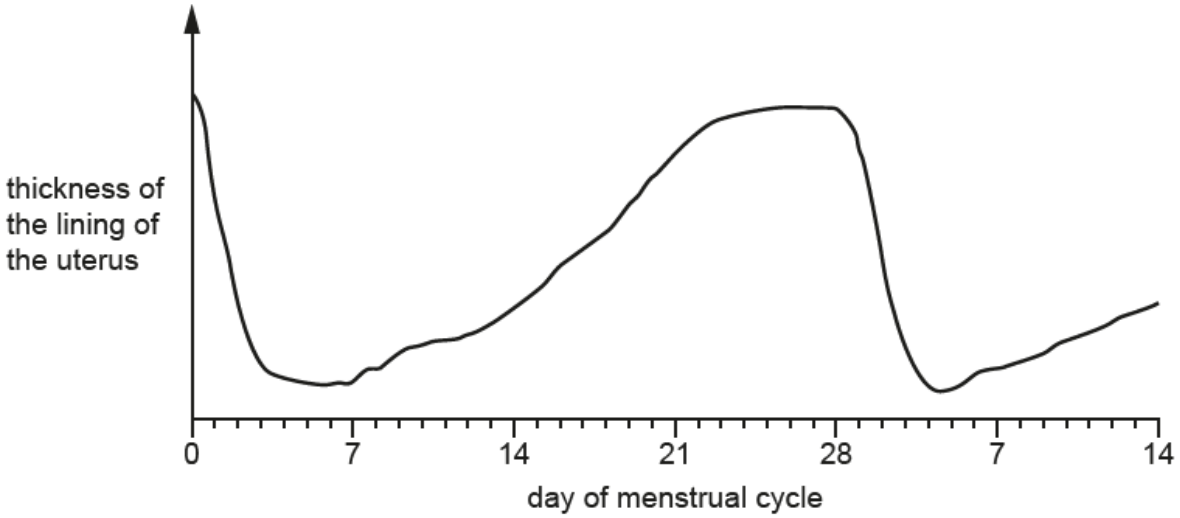


Fig. 5.1

Describe the changes in the lining of the uterus between days 0 and 28 of the menstrual cycle.

between days 0 and 7 .....

.....

.....

.....

between days 7 and 28 .....

.....

.....

.....

.....

[3]

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(c) Some people are infertile.

Artificial insemination (AI) and *in vitro* fertilisation (IVF) are two methods of fertility treatment

These two methods are outlined in Fig. 5.2.

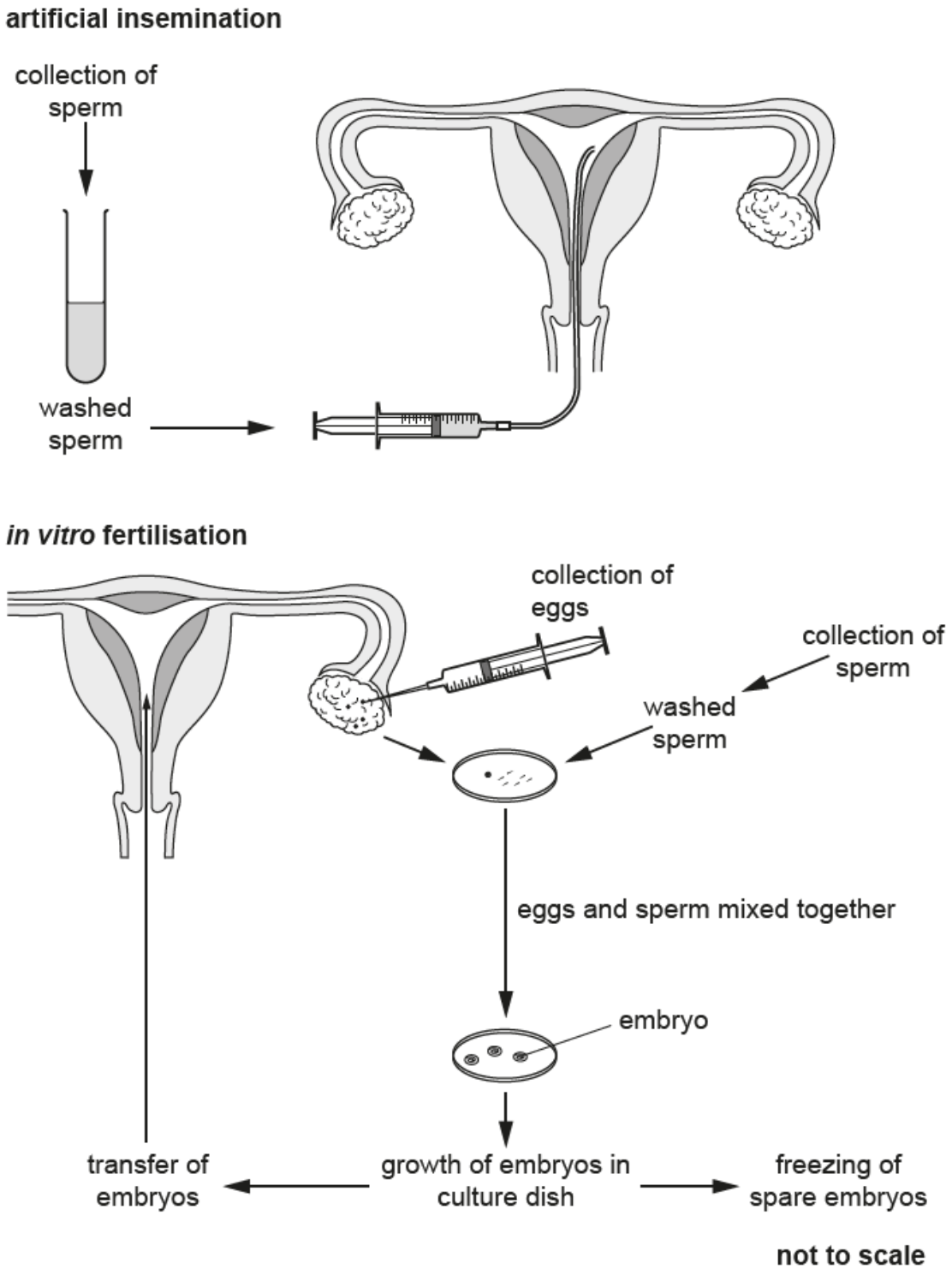


Fig. 5.2

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Describe the similarities **and** differences between the two processes of fertility treatment shown in Fig. 5.2.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

..... [6]

[Total: 14]

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21. Nov/2020/Paper_43/No.5

Fig. 5.1 shows a photomicrograph of a sperm cell reaching an egg cell.

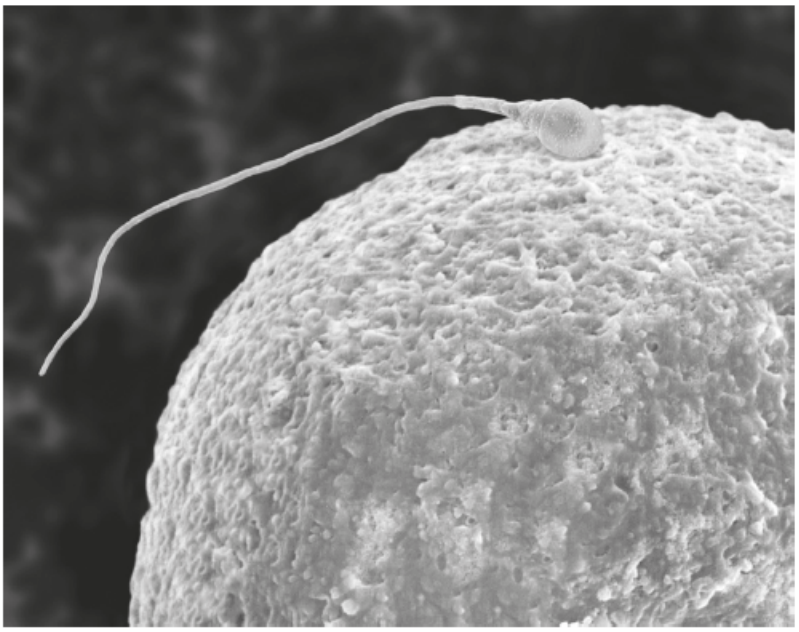


Fig. 5.1

(a) (i) Complete the sentence:

A nucleus containing a single set of unpaired chromosomes in a sperm is called a

..... nucleus. [1]

(ii) State where, in the female reproductive system, the event shown in Fig. 5.1 occurs.

..... [1]

(iii) Describe what happens from the event shown in Fig. 5.1 until an embryo is formed.

.....

.....

.....

.....

.....

.....

.....

.....

..... [4]

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(b) Some people use fertility drugs and *in vitro* fertilisation (IVF) to have children.

Outline the use of fertility drugs and the process of IVF.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

..... [6]

[Total: 12]

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22. Nov/2020/Paper_33/No.2

(a) Fig. 2.1 is a diagram of the human male reproductive system.

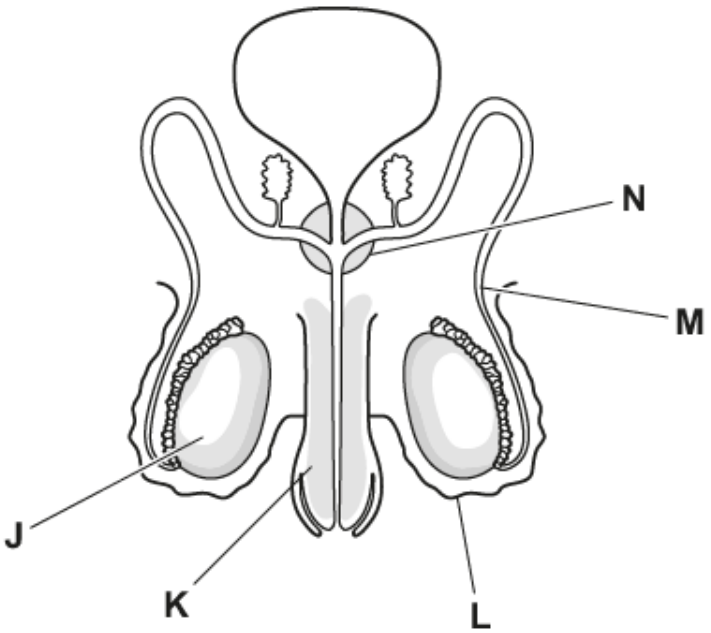


Fig. 2.1

The boxes on the left show the letters from Fig. 2.1.

The boxes in the middle show the names of the parts shown in Fig. 2.1.

The boxes on the right show the function of each part.

Draw **one** line to link each letter from Fig. 2.1 to its correct name.

Draw **one** line to link each name to its correct function.

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Draw a total of **ten** lines.

letter from Fig. 2.1	name	function
J	penis	carries sperm cells away from the testis
K	prostate gland	delivers sperm into the vagina
L	scrotum	holds the testes and keeps them cool
M	sperm duct	makes the fluid that sperm cells swim in
N	testis	where sperm are made

[5]

(b) State **two** barrier methods of birth control.

1 .....

2 .....

[2]

[Total: 7]

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Reproduction – 2020 IGCSE 0610

1. March/2020/Paper_12/No.29

Which statement about asexual reproduction is correct?

A Asexual reproduction produces genetically identical offspring from one parent.

B Asexual reproduction produces genetically identical offspring from two parents.

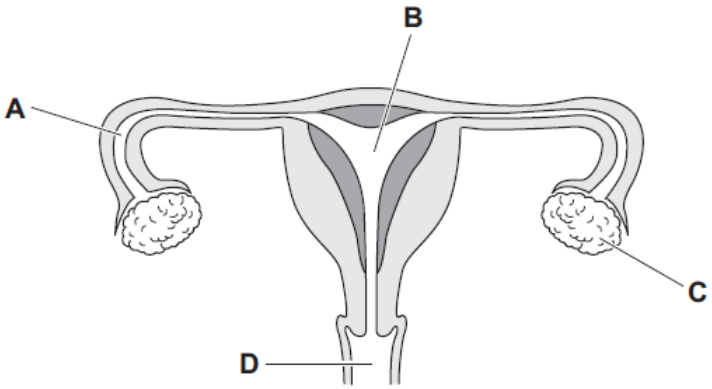
C Asexual reproduction produces genetically different offspring from one parent.

D Asexual reproduction produces genetically different offspring from two parents.

2. March/2020/Paper_12/No.31

The diagram shows the female reproductive system.

Where are gametes produced?



3. March/2020/Paper_32/No.4

(a) A study estimated the percentage effectiveness of different types of birth control.

Table 4.1 shows examples of four different categories of birth control:

- barrier
- chemical
- natural
- surgical.

Table 4.1

example of birth control	category	percentage effectiveness
abstinence		100
contraceptive injection		94–99
femidom		79–95
IUS	chemical	99
vasectomy		100

(i) Complete Table 4.1 to show the different categories of each example of birth control.

One has been done for you. [4]

(ii) State the **two** most effective examples of birth control from Table 4.1.

..... [1]

(iii) State **two** examples of birth control from Table 4.1 that prevent the spread of sexually transmitted infections (STIs).

1 .....

2 .....

[2]

(b) Complete the sentences about STIs using words from the list.

Each word can be used once, more than once or not at all.

AIDS	**bacteria**	**blood**	**food**
infection	**ingesting**	**injecting**	
pregnancy	**sexually**	**variation**	**virus**

..... transmitted infections are transmitted via body fluids.

Human immunodeficiency ..... is an example of an STI.

HIV can be transmitted through transfusions of contaminated .....

and by ..... drugs.

HIV infection may eventually lead to ..... .

[5]

[Total: 12]

4. June/2020/Paper_11/No.23

What causes the development of female secondary sexual characteristics?

A adrenaline production

B menstrual cycle starting

C oestrogen production

D ovulation occurring

5. June/2020/Paper_11/No.27

What takes place during fertilisation?

A One gamete produces one zygote.

B One gamete produces two zygotes.

C Two gametes produce one zygote.

D Two gametes produce two zygotes.

6. June/2020/Paper_11/No.28

What is the transfer of pollen from an anther to a stigma called?

A fertilisation

B respiration

C meiosis

D pollination

7. June/2020/Paper_11/No.29

What happens to the uterus lining during menstruation?

A breaks down

B new blood vessel growth

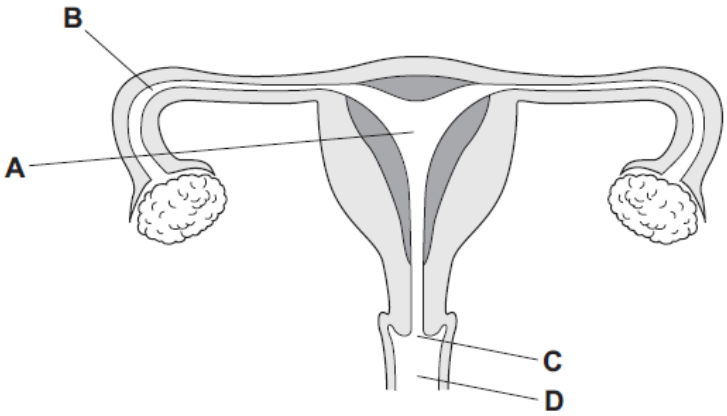
C implantation of embryo

D repair and thickening

8. June/2020/Paper_11/No.30

The diagram of the female reproductive system shows where different methods of birth control can be used.

Where would an IUD be placed?



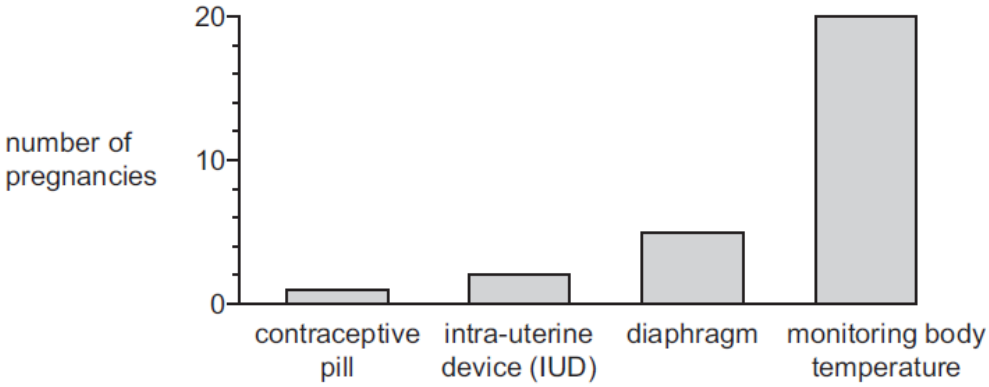
9. June/2020/Paper_12/No.28

Where do fertilisation and pollination occur in a flower?

	fertilisation	pollination
A	carpel	ovule
B	ovary	stigma
C	stigma	anther
D	style	carpel

10. June/2020/Paper_12/No.30

The graph shows the number of pregnancies in 4 groups of 100 women. Each group used a different method of contraception.



The method of contraception which is the **most** effective is

A barrier.

B chemical.

C natural.

D surgical.

11. June/2020/Paper_13/No.24

Which organ produces oestrogen?

A heart

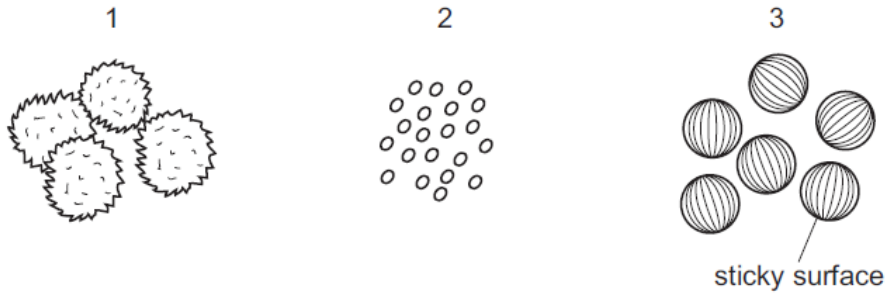
B lung

C ovary

D oviduct

12. June/2020/Paper_13/No.28

The diagrams show pollen grains from three different species of plant as they appear under the microscope. The diagrams are all to the same scale.



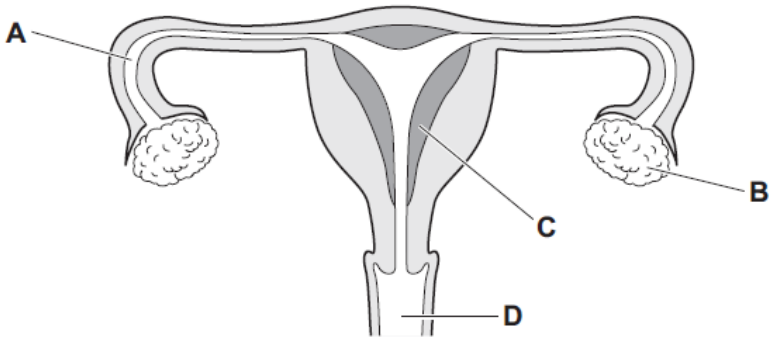
Which pollen grains are most likely to be carried by the wind?

A 1 and 2 **B** 2 only **C** 2 and 3 **D** 3 only

13. June/2020/Paper_13/No.29

The diagram shows the human female reproductive system.

In which structure does fertilisation occur?



14. June/2020/Paper_21/No.28

The diagram shows a sperm cell.

Which part contains enzymes that digest the jelly coat of an egg cell?



15. June/2020/Paper_22/No.27

Asexual reproduction can be used to produce crops.

Why might a disease be likely to spread throughout the whole crop?

A crop plants are genetically different

B crop plants are genetically identical

C many offspring are produced

D offspring are produced quickly

16. June/2020/Paper_22/No.28

In a comparison between the processes of artificial insemination (AI) and in vitro fertilisation (IVF), which statement applies to IVF only?

A Human egg cells are harvested from the ovary.

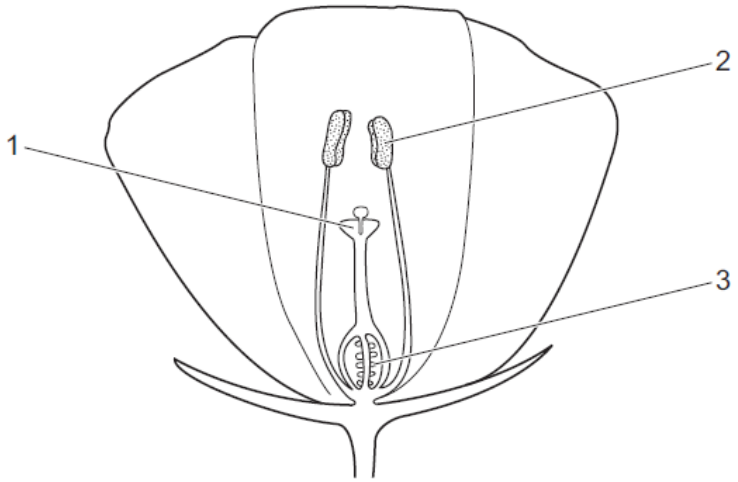
B Donated sperm cells are used to fertilise the egg cells.

C Childless couples are given the opportunity to have a child of their own.

D Fertilisation occurs inside the body of the female.

17. June/2020/Paper_22/No.29

The diagram shows half a flower. There is a description of each numbered part.



1 the stigma which receives pollen from insects

2 the anther which produces smooth and light pollen grains

3 the ovule where fertilisation occurs when the male and female nuclei fuse

Which descriptions are correct for an insect-pollinated flower?

A 1 only **B** 1 and 3 only **C** 2 and 3 only **D** 1, 2 and 3

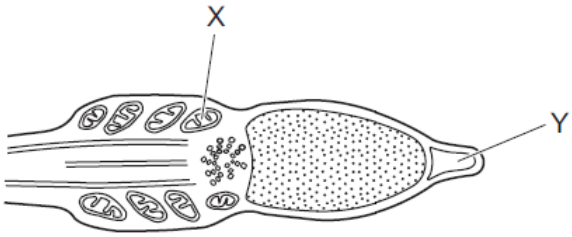
18. June/2020/Paper_23/No.27

Which row describes cross-pollination?

	pollen transferred from anther to stigma of		
	a different flower on same plant	a flower on a different plant of same species	a flower on a different plant of a different species
A	✓	✓	✗
B	✓	✗	✓
C	✗	✓	✗
D	✗	✗	✓

19. June/2020/Paper_23/No.29

The diagram shows the head of a sperm.



What are the functions of structures X and Y?

	X	Y
A	protein synthesis	digestion of egg cell jelly coat
B	releases energy for movement	digestion of egg cell jelly coat
C	protein synthesis	energy store
D	releases energy for movement	energy store

20. June/2020/Paper_31/No.2

Fig. 2.1 shows an image of two sperm cells.

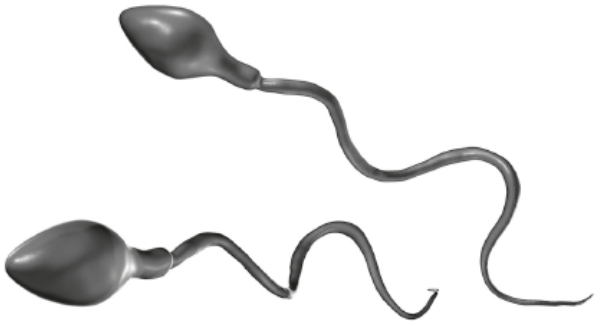


Fig. 2.1

(a) State **two** adaptive features of sperm.

1 .....

.....

2 .....

.....

[2]

(b) Describe the process of fertilisation.

.....

.....

.....

..... [2]

(c) Fig. 2.2 shows a fetus during development.

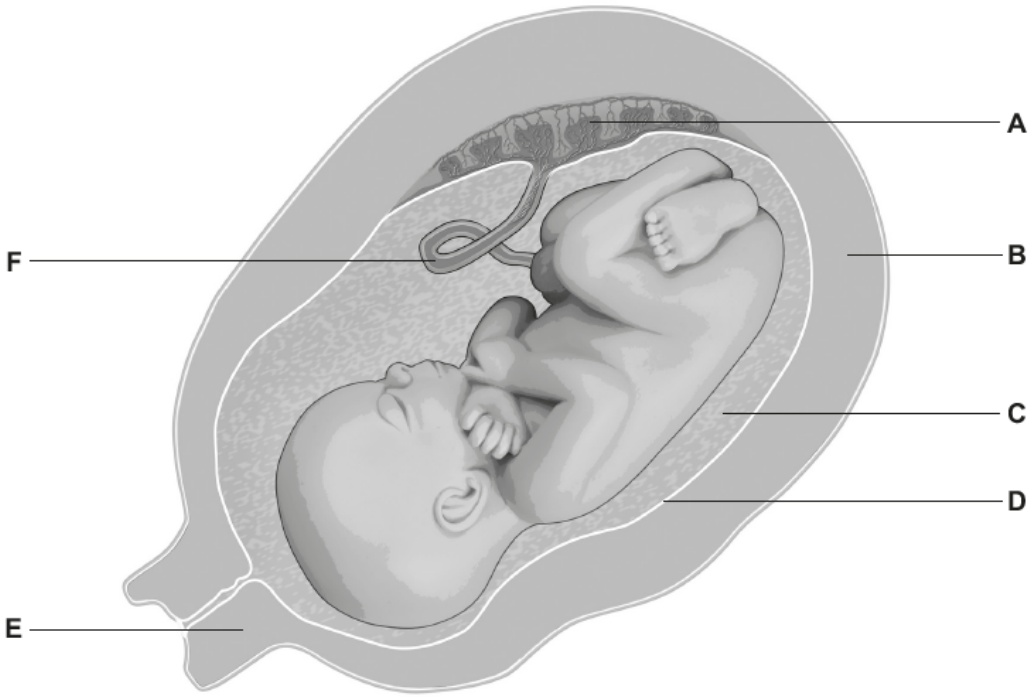


Fig. 2.2

Complete Table 2.1 by stating:

- the missing letters from Fig. 2.2
- the missing name of the structure
- **one** function for structures **C**, **A** and **F** during pregnancy or birth.

Table 2.1

letter on Fig. 2.2	name of the structure	**one** function
C	amniotic fluid	
		dilates during birth
A	placenta	
F	umbilical cord	
	uterus wall	contracts during birth

[6]

[Total: 10]

21. June/2020/Paper_32/No.2

(a) Fig. 2.1 is a diagram of the human female reproductive system.

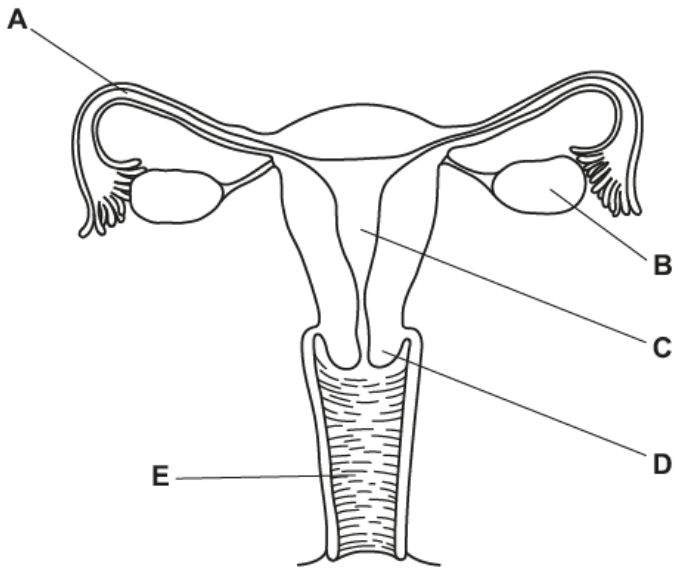


Fig. 2.1

Identify the letter from Fig. 2.1 which represents:

- the vagina .....
- the uterus .....
- where ovulation occurs .....
- where the fetus grows .....
- where fertilisation occurs. .....

Each letter may be used once, more than once or not at all. [5]

(b) Egg cells are the female gametes and have special adaptive features.

Complete the sentences using words from the list.

Each word may be used once, more than once or not at all.

birth **cellulose** **cytoplasm** **energy**

fertilisation **jelly** **labour**

Egg cells have ..... stores so that they can survive for several days in the female reproductive system after ovulation.

They also have a ..... coating which changes after ..... to prevent more sperm from entering the egg. [3]

(c) Table 2.1 shows the average diameters of egg cells from different mammals.

Table 2.1

mammal	average diameter of egg cell / μm
goat	122
horse	168
human	165
mouse	90
rabbit	165
sheep	125

(i) State the name of the mammal with the egg cell that has the smallest average diameter in Table 2.1.

..... [1]

(ii) Calculate the difference in average diameter between the egg cells of humans and goats.

.....μm [1]

(d) Larger mammals usually have egg cells with a greater diameter.

Suggest which is the largest mammal using the information in Table 2.1.

..... [1]

[Total: 11]

22. June/2020/Paper_32/No.5

(a) Fig. 5.1 is a photograph of part of a flower.

Some of the outer structures have been removed to show the internal parts.



Fig. 5.1

(i) Label these structures on Fig. 5.1 with a label line and the name:

- anther
- petal
- stigma.

[3]

(ii) Describe **two** features visible in Fig. 5.1 that suggest that this is an insect-pollinated flower.

1 .....

.....

2 .....

.....

[2]

(b) Many living organisms can be classified as plants or animals.

Table 5.1 shows some features of animals and plants.

Place ticks (✓) in the boxes to show the correct features of animals and plants.

Table 5.1

feature	animals	plants
can respire		
can grow		
can make their own food		
contain DNA		
can respond to changes in their environment		

[5]

(c) State **two** structures that are present in plant cells but **not** in animal cells.

1 .....

2 .....

[2]

[Total: 12]

23. June/2020/Paper_41/No.4

Johnson grass, *Sorghum halepense*, is wind-pollinated.

(a) Fig. 4.1 shows some Johnson grass flowers.



Fig. 4.1

(i) State the genus of Johnson grass.

..... [1]

(ii) Describe **two** features **visible in Fig. 4.1** that show that Johnson grass flowers are adapted for wind-pollination.

1 .....

.....

2 .....

.....

[2]

(b) Fig. 4.2 shows a section through a carpel shortly after pollination.

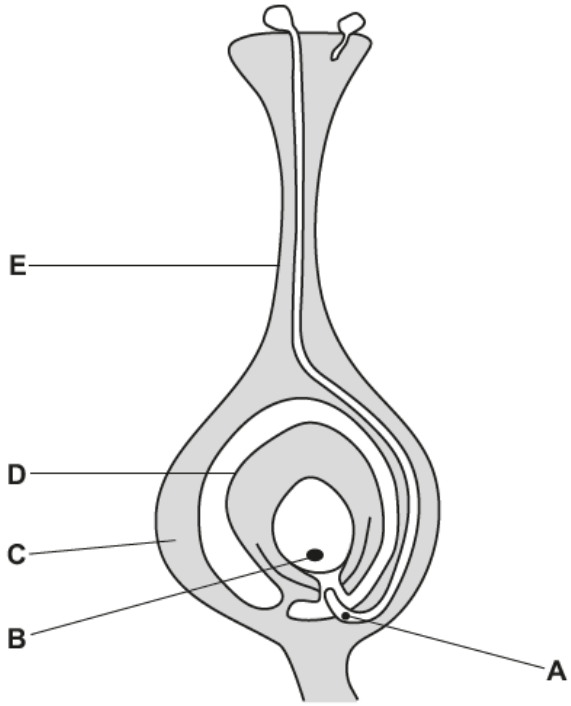


Fig. 4.2

(i) State the names of the parts of the carpel labelled **C**, **D** and **E**.

C .....

D .....

E .....

[3]

(ii) Complete the sentences:

Pollen grains are formed in anthers. During their formation the number of chromosomes in the nuclei is halved by the process of ..... . This means the male nucleus **A** in the pollen tube is described as a ..... nucleus. When nucleus **A** ..... with nucleus **B**, the chromosome number doubles to form a ..... nucleus. The name of this process is ..... . Then the ..... divides by the process of ..... to form an embryo.

[7]

(c) Discuss the advantages of sexual reproduction to a wild population of flowering plants such as Johnson grass.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

..... [5]

(d) Sexual reproduction requires energy.

State **three** uses of energy in organisms **other than in reproduction**.

1 .....

2 .....

3 .....

[3]

[Total: 21]

24. June/2020/Paper_42/No.2

Pregnancy can occur after the fusion of a male gamete and a female gamete.

(a) State the name of the ball of cells that implants into the uterus after fertilisation.

..... [1]

(b) There are many changes that occur in a fetus during pregnancy.

Compare the development of a fetus in the early stages of pregnancy to its development in the late stages of pregnancy.

.....

.....

.....

.....

..... [2]

(c) Describe the functions of amniotic fluid and the amniotic sac.

.....

.....

.....

.....

.....

.....

.....

.....

..... [4]

(d) The umbilical artery is found in the umbilical cord. This artery transports blood away from the heart of the fetus.

The umbilical artery is unusual because it transports deoxygenated blood.

(i) State the name of **one** other artery in the mother that transports deoxygenated blood.

..... [1]

(ii) State **one** excretory product that is transported from the fetus to the placenta.

..... [1]

(iii) State the name of the process that allows substances to move down a concentration gradient across the placenta.

..... [1]

(e) One of the functions of the placenta is to provide a barrier to toxins and pathogens.

A study was done on donated afterbirths. The afterbirth is a placenta with part of the umbilical cord attached.

The purpose of the study was to find the maximum size of particles that can pass through the placenta and enter the umbilical cord.

The researchers inserted beads with a diameter of 0.5 μm into blood vessels in the placenta. Three hours later they recorded the percentage of beads found in the blood in the placenta and in the umbilical cord.

They then repeated the tests using beads with diameters of 0.8 μm, 2.4 μm, 5.0 μm and 8.0 μm.

Their results are shown in Fig. 2.1.

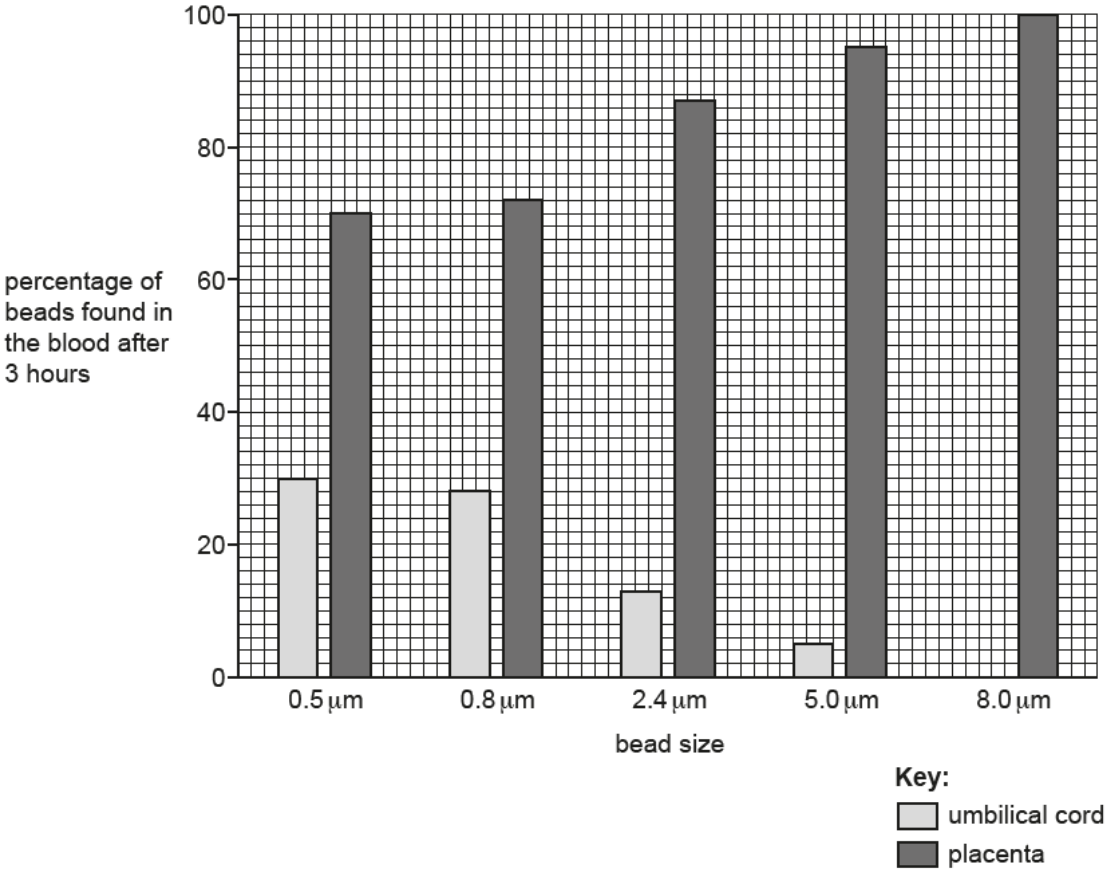


Fig. 2.1

(i) Convert the diameter of the 5.0 μm beads into millimetres (mm).

Space for working.

..... mm [1]

(ii) One million beads with a diameter of 2.4 μm were injected into the placenta.

Calculate the number of these beads in the umbilical cord after 3 hours.

Space for working.

..... beads
[2]

(iii) Table 2.1 shows a range of substances and their diameters.

Table 2.1

toxins and pathogens	diameter / μm
nicotine	2.0×10^{-2}
drug **X**	3.0×10^{-2}
rubella virus	5.0×10^{-2}
Vibrio cholerae	8.0×10^{-1}
Trypanosoma brucei	1.8×10^{1}

State the names of **all** the toxins and pathogens listed in Table 2.1 that could pass through the placenta and enter the umbilical cord.

Use the data in Fig. 2.1 to make your choice.

.....

.....

..... [1]

(f) Fig. 2.2 shows the junction between two neurones with drug **X** absent and two neurones with drug **X** present, immediately after a painful stimulus.

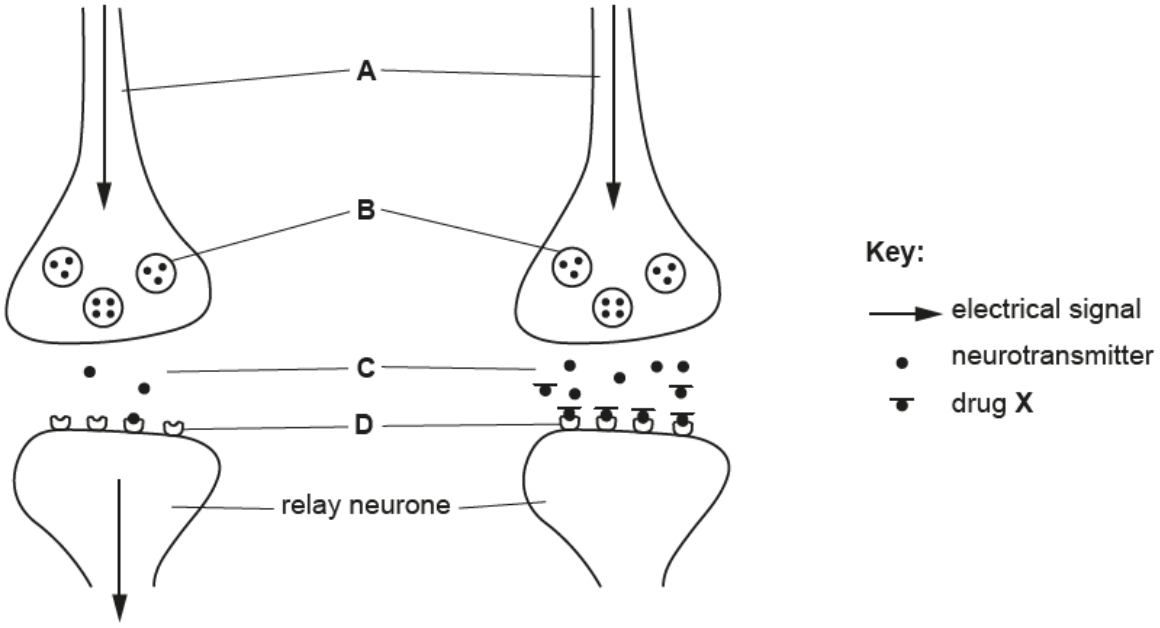


Fig. 2.2

(i) State the names of **A**, **B**, **C** and **D** in Fig. 2.2.

A .....

B .....

C .....

D .....

[4]

(ii) Describe **and** explain how drug **X** affects the function of the relay neurone shown in Fig. 2.2.

.....

.....

.....

.....

.....

.....

..... [3]

(g) Drug **X** can be injected into the body. This is one way that HIV can be transmitted.

Describe **two** other ways that HIV can be transmitted.

1 .....

.....

2 .....

.....

[2]

[Total: 23]

25. June/2020/Paper_42/No.6

(a) Fig. 6.1 is a diagram showing some parts of a plant. The circle shows a magnified cross-section of part of the stem.

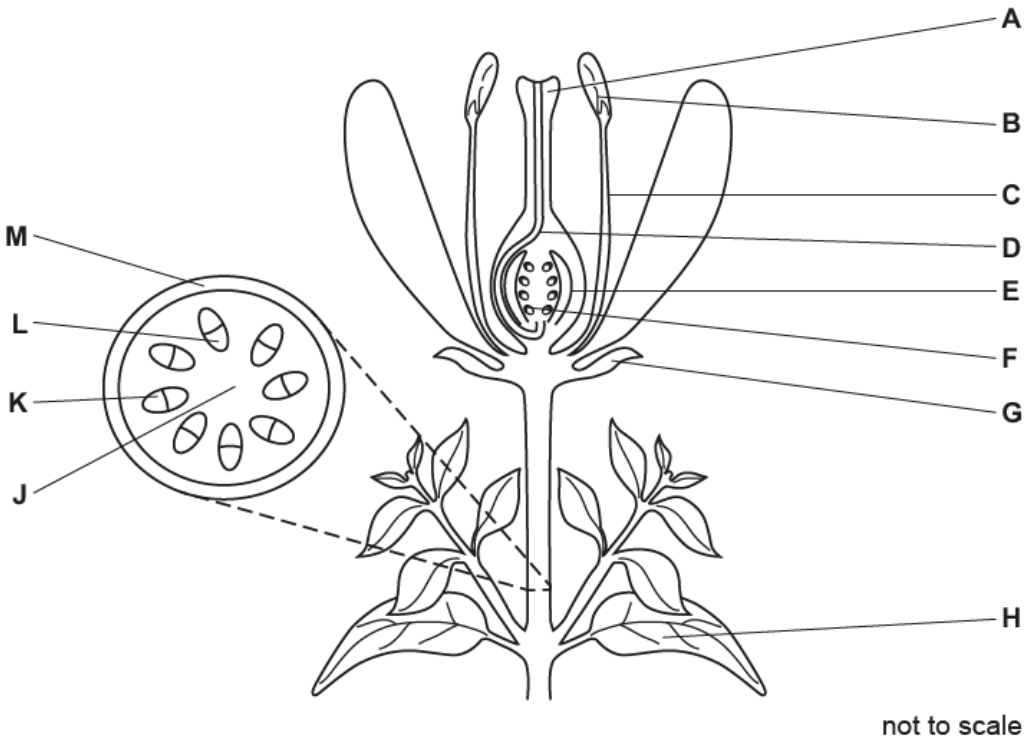


Fig. 6.1

(i) Table 6.1 contains statements about the functions of some of the structures in Fig. 6.1.

Complete the table by:

- stating the name of the structure
- identifying the letter that labels that structure.

Table 6.1

function	name of structure	letter from Fig. 6.1
provides support to the stem		
protects flower bud		
produces glucose		
produces pollen		
delivers male nuclei to the site of fertilisation		

[5]

(ii) State **one** letter from Fig. 6.1 that identifies a structure that contains a **haploid** nucleus.

..... [1]

(iii) State the name of the process that describes the transport of sucrose in a plant.

..... [1]

(iv) State **one** letter from Fig. 6.1 that is a structure that is an example of a source for sucrose transport.

..... [1]

(b) In addition to sucrose, amino acids are also transported in plants.

(i) State the name of a mineral ion that becomes part of an amino acid.

..... [1]

(ii) State the name of the structures inside cells that assemble amino acids into proteins.

..... [1]

(iii) State the name of the group of molecules that are made of proteins and act as catalysts.

..... [1]

[Total: 11]

1 When a baby is born, these processes occur.

1 breaking of the amniotic sac

2 contraction of muscles in the uterus wall

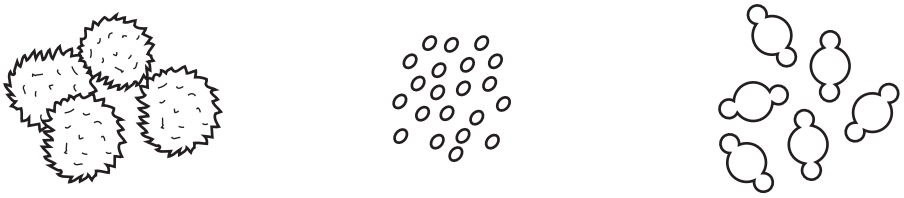
3 cutting of the umbilical cord

In which order do these processes usually occur?

A 2 → 1 → 3 B 2 → 3 → 1 C 3 → 1 → 2 D 3 → 2 → 1

2 The diagrams show pollen grains from three different species of plant as they appear under the microscope. The diagrams are all to the same scale.

1 2 3

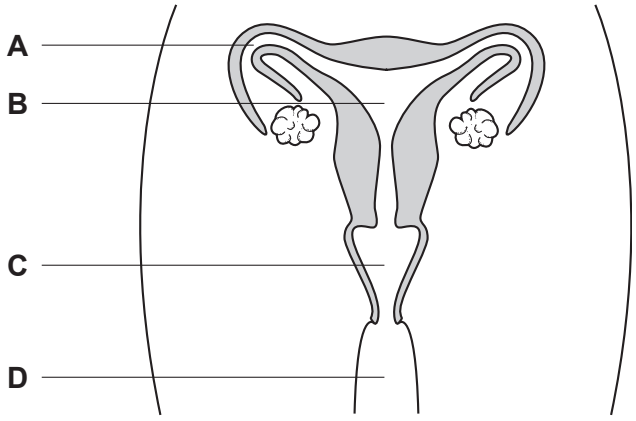


Which pollen grains are involved in insect-pollination?

A 1 and 2 B 1 only C 2 and 3 D 3 only

3 The diagram shows the human female reproductive system.

If a woman uses a femidom as a contraceptive, where would it be placed?



4 In which conditions will seeds germinate most quickly?

A dry and cold

B dry and warm

C wet and cold

D wet and warm

5 What are the characteristics of asexual reproduction?

	fusion of gamete nuclei	genetic variety in the offspring
A	✓	✓
B	✓	✗
C	✗	✓
D	✗	✗

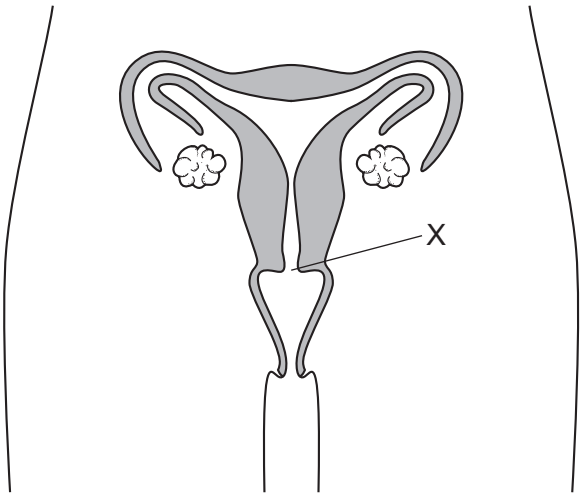
6 The table shows the conditions provided for four sets of seeds.

Which of the seeds germinate?

	oxygen	water	carbon dioxide
A	✓	✓	✓
B	✓	✗	✗
C	✗	✓	✓
D	✗	✗	✗

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7 The diagram shows a human female's reproductive organs.



What is the name of structure X?

A cervix

B ovary

C oviduct

D ovule

8 What are advantages of sexual and asexual reproduction?

	advantage of sexual reproduction	advantage of asexual reproduction
A	less population growth	only one parent required
B	more energy efficient	gametes can be transferred by environment
C	more genetic variation	faster
D	no transfer of gametes needed	does not compete with the parent for nutrients

STEMUP.CO.UK

9 Where are oestrogen and progesterone produced during the menstrual cycle?

	oestrogen	progesterone
A	hypothalamus	ovary
B	ovary	ovary
C	ovary	placenta
D	placenta	pituitary gland

10 A teacher said a way to remember the difference between two groups of cells is 'many, minute and motile' or 'few, fat and fixed'

What are the groups of cells?

A animal and plant cells

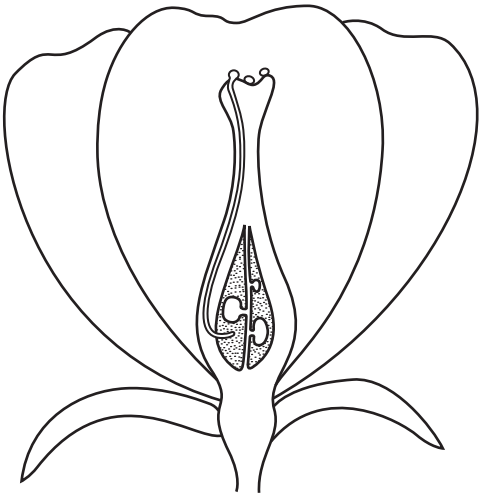
B male and female gametes

C red and white blood cells

D xylem and phloem cells

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11 The diagram shows a flower.



Which processes have taken place?

	pollination	fertilisation
A	no	no
B	no	yes
C	yes	no
D	yes	yes

12 The concentrations of LH and oestrogen are measured during part of a menstrual cycle.

On which day does ovulation occur?

	date	concentration of LH / arbitrary units	concentration of oestrogen / arbitrary units
A	March 25th	10	30
B	March 28th	12	135
C	March 31st	120	130
D	April 3rd	20	25

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13 What must always be available to allow seeds to germinate?

A carbon dioxide

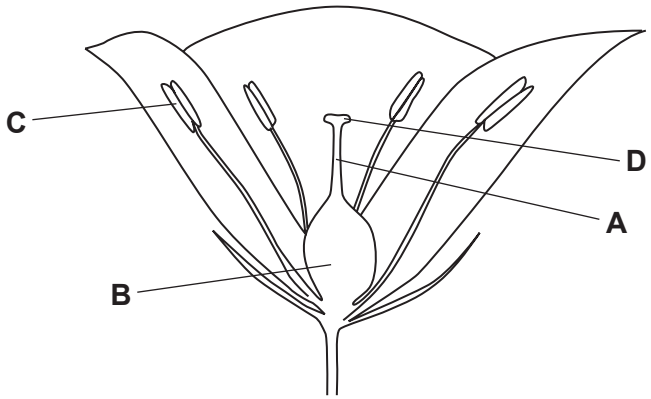
B light

C mineral salts

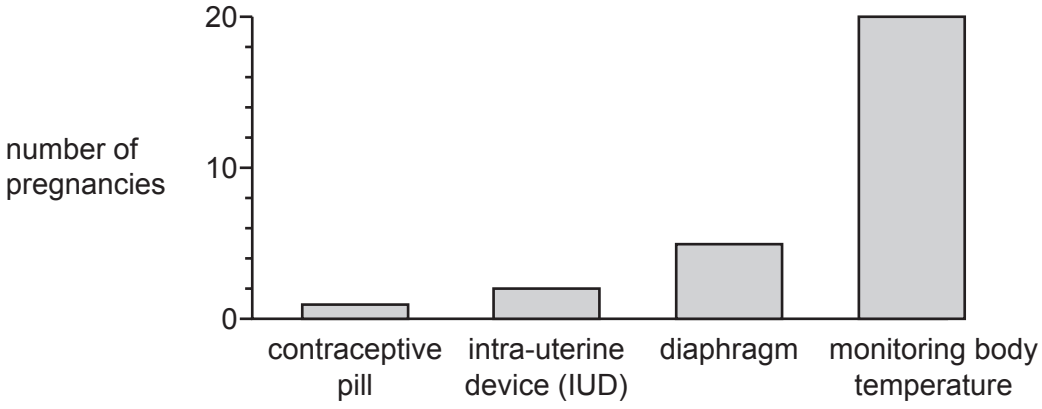
D water

14 The diagram shows a flower.

In which structure do seeds develop?



15 The graph shows the number of pregnancies in four groups of 100 women. Each group used a different method of contraception.



The method of contraception which is the **least** effective is

A barrier.

B chemical.

C natural.

D surgical.

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16 The following statements are about some hormones in the human body.

V causes changes in the ovaries during the menstrual cycle

W promotes the development of stronger muscles

X causes the voice to deepen at puberty

Y produced by the pancreas

Which statements are correct for testosterone?

A V and W **B** V and Y **C** W and X **D** X and Y

17 Which hormone maintains the lining of the uterus during pregnancy?

A FSH

B oestrogen

C progesterone

D testosterone

18 In sexual reproduction in humans, why are sperm cells produced in much greater numbers than egg cells?

A More than one sperm cell fertilises an egg.

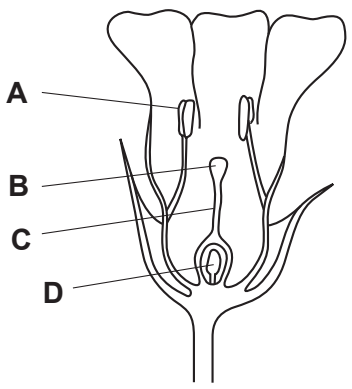
B Sperm cells are small in size.

C Sperm cells live for only a short time.

D The chance of one sperm cell reaching an egg is very small.

19 The diagram shows half a flower.

On which structure would pollen be deposited in pollination?



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20 In which region does diffusion of materials take place between mother and fetus?

A amniotic sac

B ovary

C placenta

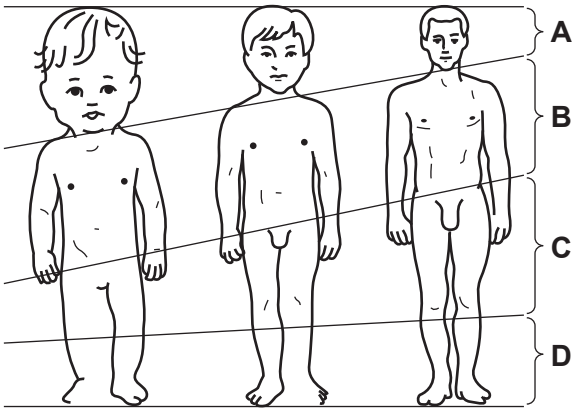
D umbilical cord

21 During childbirth, what must happen to the cervix and the uterus wall?

	cervix	uterus wall
A	contracts	contracts and relaxes
B	contracts	relaxes
C	dilates	contracts and relaxes
D	dilates	relaxes

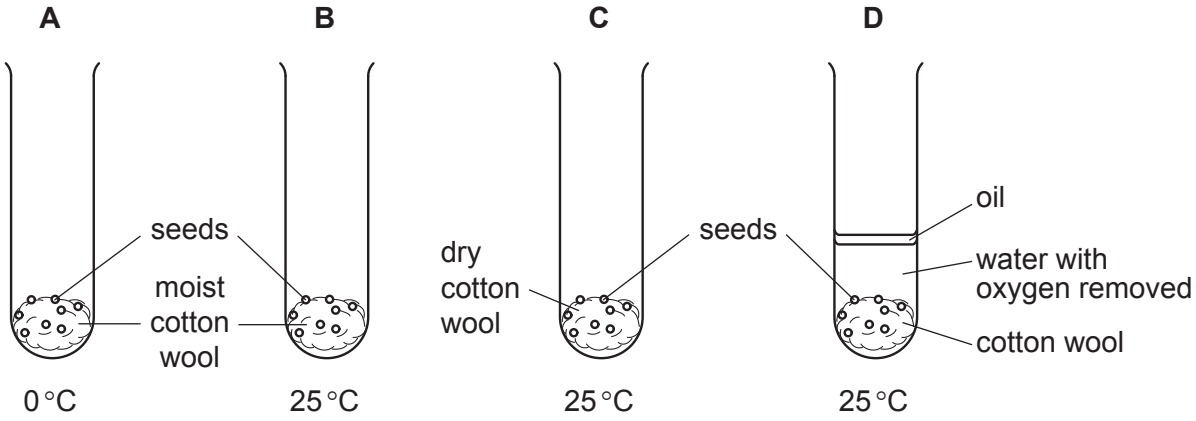
22 The diagram shows a baby, a child and an adult (not drawn to the same scale)

As a baby grows into an adult, which labelled region grows the **most**?

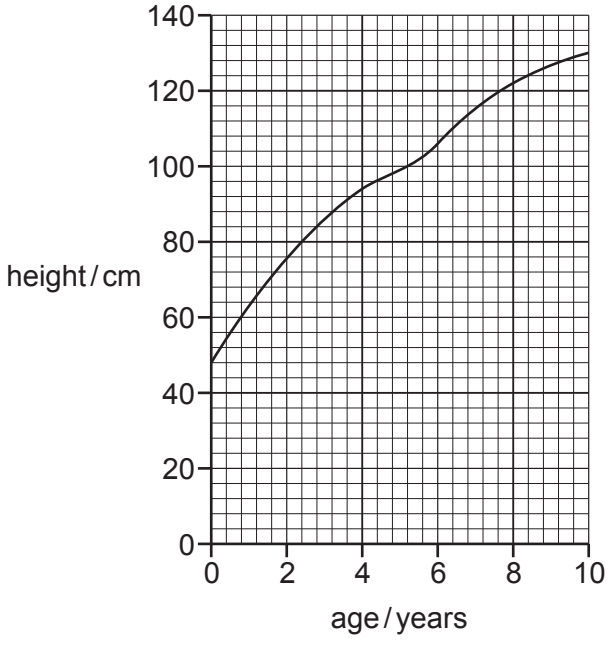


23 Four tubes were set up as shown and placed in the dark.

In which tube would the seeds germinate first?



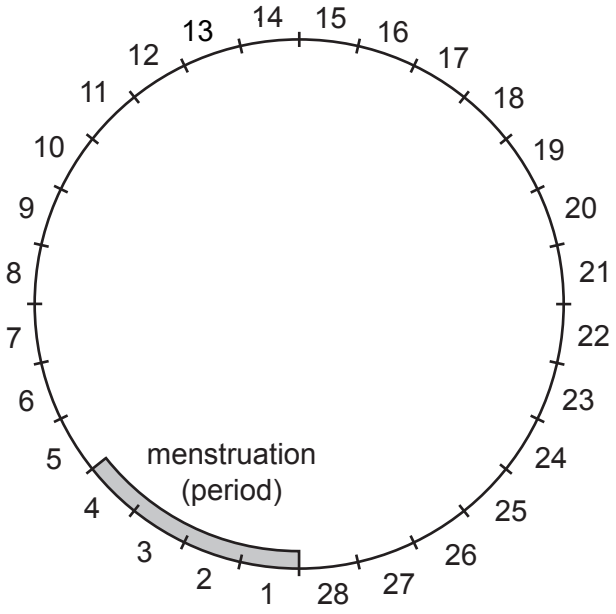
24 The graph shows the height of a child, from birth to the age of 10.



What was the approximate height of the child at 7 years of age?

A 106 cm **B** 116 cm **C** 122 cm **D** 130 cm

25 The diagram shows a timeline of a woman's menstrual cycle, which lasts for 28 days



On which days of the menstrual cycle is a woman most likely to become pregnant?

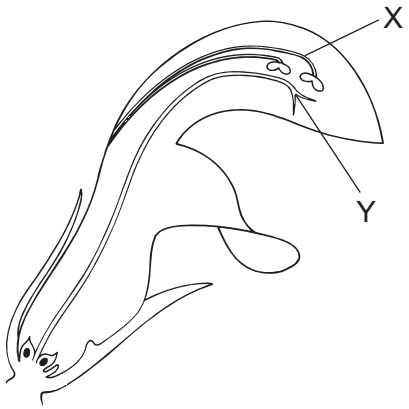
A days 1 - 4

B days 7 - 10

C days 13 - 16

D days 20 - 23

26 The diagram shows a vertical section through a flower.



What are X and Y?

	X	Y
A	anther	stigma
B	anther	style
C	stamen	stigma
D	stamen	style

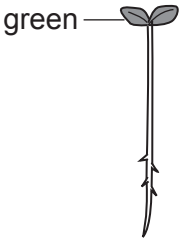
27 Four samples of seeds germinated in different conditions of temperature and light, as shown in the table.

sample	temperature / °C	light
1	20	absent
2	20	present
3	5	absent
4	5	present

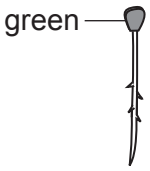
A typical seedling from each sample was removed after seven days.

Which seedling was from sample 2?

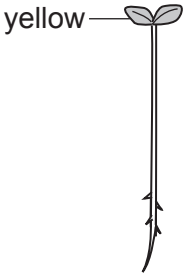
A



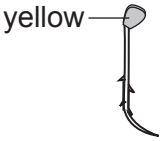
B



C



D



28 Which structure is involved in the transfer of dissolved nutrients from the mother to the fetus?

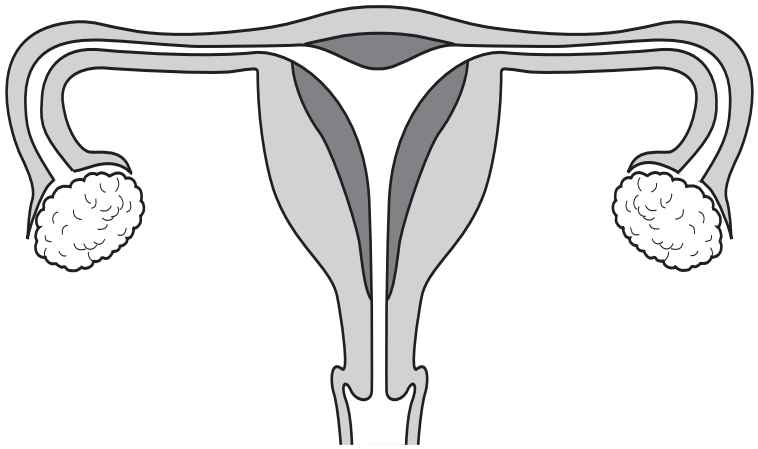
A kidney

B liver

C placenta

D stomach

29 The diagram shows the human female reproductive system.



After ejaculation, along which route does a male gamete travel to fuse with an egg?

A ovary → oviduct → uterus → cervix

B ovary → uterus → cervix → vagina

C vagina → cervix → uterus → oviduct

D vagina → uterus → cervix → oviduct

30 Which set of conditions is required for seed germination?

	oxygen	warmth	water
A	✓	✗	✓
B	✓	✓	✗
C	✗	✓	✓
D	✓	✓	✓

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31 Which method of birth control is based on knowing the stage of a woman's menstrual cycle?

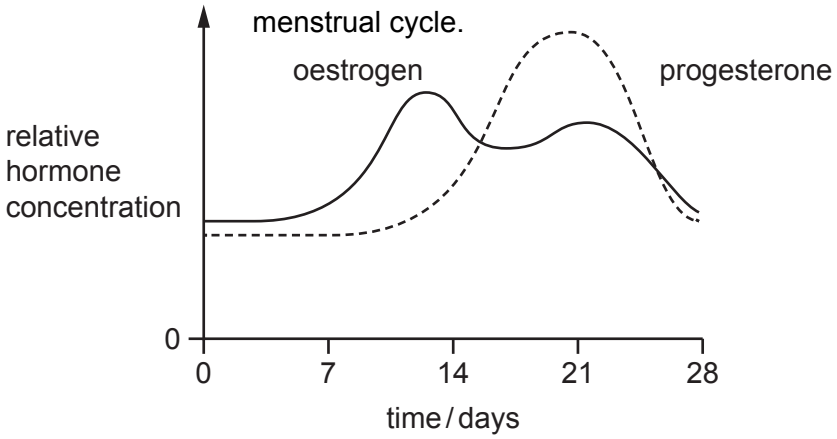
A condom

B contraceptive pill

C diaphragm

D rhythm method

32 The diagram shows some changes which take place during a woman's menstrual cycle.



Assuming ovulation occurs on day 14, what is occurring at the time of ovulation?

A a fall in the levels of oestrogen and progesterone

B a fall in the level of progesterone only

C a rise in the level of oestrogen

D a rise in the level of progesterone and fall in the level of oestrogen

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33 Development is defined as an increase in

A complexity.

B dry mass.

C number of cells.

D size.

34 In addition to a suitable temperature, what else is always necessary for seed germination?

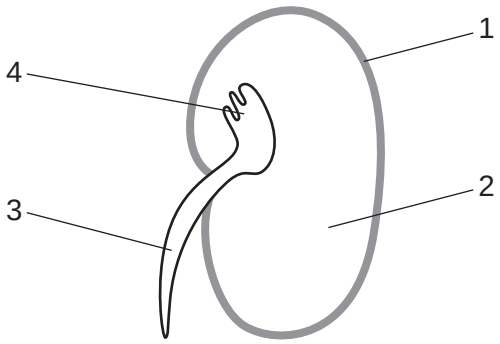
A carbon dioxide and sunlight

B mineral ions

C sunlight and water

D water and oxygen

35 The diagram shows a germinating broad bean seed which has been cut in half.



Which labels show the cotyledon and the plumule?

	cotyledon	plumule
A	1	3
B	1	4
C	2	3
D	2	4

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36 What defines the development of an organism?

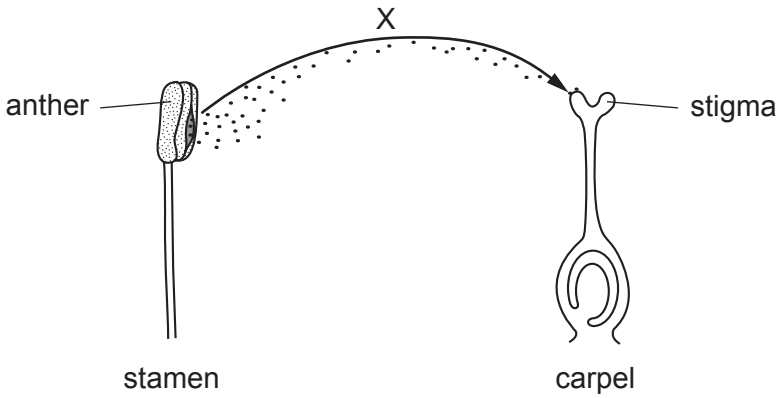
A increase in age

B increase in complexity

C increase in height

D increase in length

37 The diagram shows a process in plant reproduction.



Which process is represented by arrow X?

A fertilisation

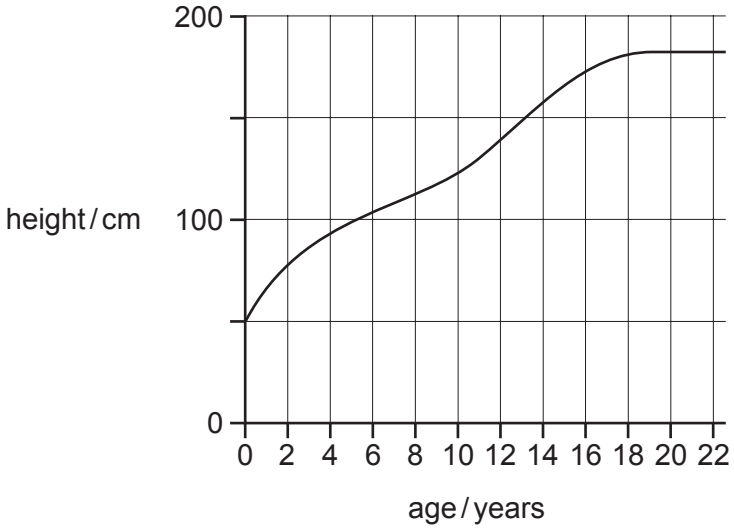
B pollen tube growth

C pollination

D seed dispersal

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38 The graph shows how human height changes with age.



In which age range is the growth rate slowest?

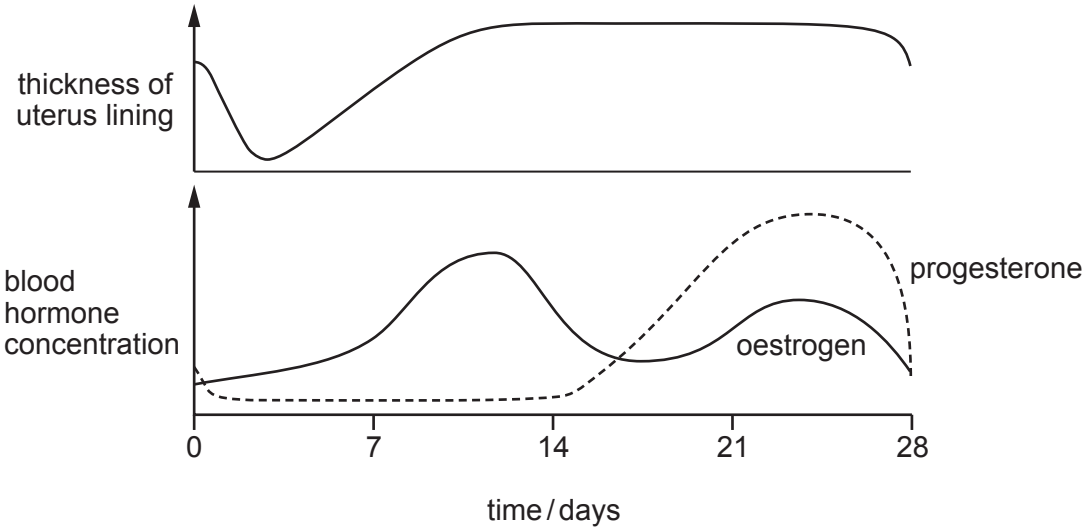
A 0–2 years

B 8–10 years

C 12–14 years

D 18–20 years

39 The graphs show changes that occur in a woman during the menstrual cycle.



Which statement is supported by evidence in the graphs?

A A large increase in progesterone concentration always results in thickening of the uterus lining.

B At ovulation, the uterus lining is at its thickest.

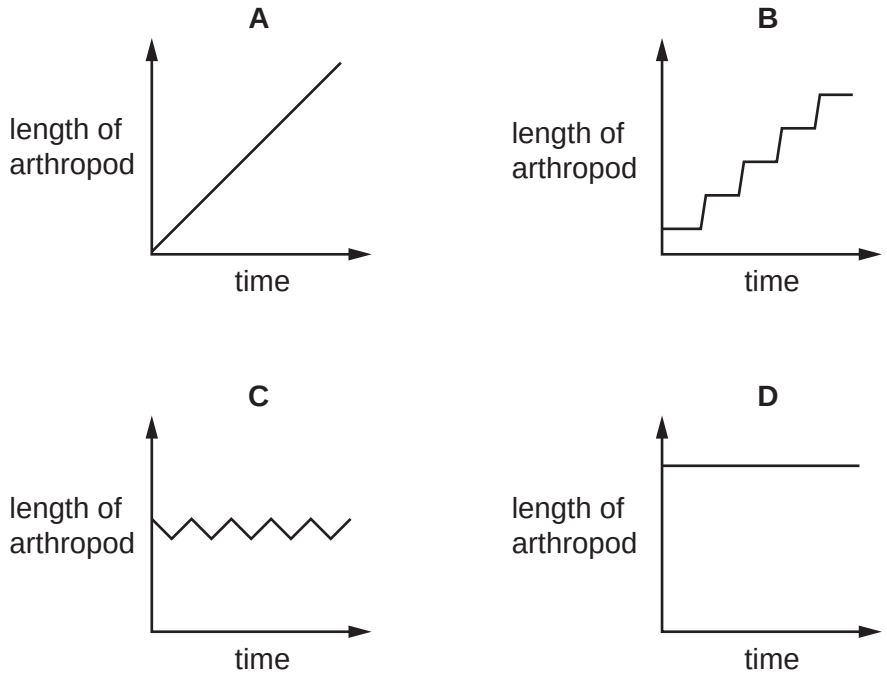
C Each time the oestrogen concentration rises, the uterus lining becomes thicker.

D Within 5 days of ovulation, the uterus lining gets thinner.

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40 In arthropods, growth occurs only after the exoskeleton is shed and before the new one hardens.

Which graph shows a typical growth curve for an arthropod?



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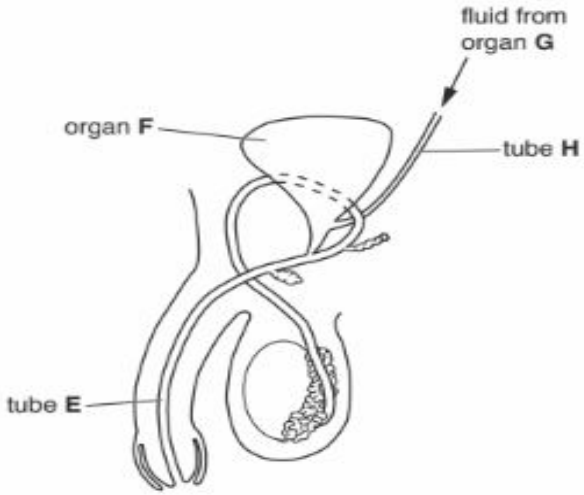
Reproduction in Humans P2 questions

(q) identify on diagrams of the male reproductive system and state the functions of the testes, scrotum,
sperm ducts, prostate gland, urethra and penis
(r) identify on diagrams of the female reproductive system and state the functions of the ovaries, oviducts,
uterus, cervix and vagina
(s) compare male and female gametes in terms of size, numbers and mobility
(t) describe the menstrual cycle, with reference to the alternation of menstruation and ovulation, the natural variation in its length and the fertile and infertile phases of the cycle
(u) explain the role of hormones in controlling the menstrual cycle (including FSH, LH, progesterone and
oestrogen)
(v) describe fertilisation and early development of the zygote simply in terms of the formation of a ball of
cells that becomes implanted in the wall of the uterus
(w) state the function of the amniotic sac and the amniotic fluid
(x) describe the function of the placenta and umbilical cord in relation to exchange of dissolved nutrients,
gases and excretory products (**no** structural details are required)
(y) describe the special dietary needs of pregnant women
(z) describe the advantages of breast milk compared with bottle milk
(aa) describe the following methods of birth control:
natural, chemical (spermicides), mechanical, hormonal and surgical
(bb) explain that syphilis is caused by a bacterium that is transmitted during sexual intercourse
(cc) describe the symptoms, signs, effects and treatment of syphilis
(*dd*) discuss the spread of human immunodeficiency virus (HIV) and methods by which it may be controlled

Reproduction in Humans P2 questions

0/N18/22/Q2

The diagram shows the human male reproductive organs and associated structures.



(a) (i) Identify each of the following:

tube **E** .....

organ **F** .....

organ **G** .....

tube **H** ..... [4]

(ii) State **one** difference between the fluids carried by tube **E** and tube **H**.

.....

.....[1]

(b) (i) State **one** way in which the fluid from organ **G** may be different in a person with diabetes compared to a person without diabetes.

.....

.....[1]

(ii) A person with diabetes may be treated with insulin produced by genetically modified bacteria.

Outline how such genetically modified bacteria may be produced and used to manufacture human insulin on a commercial scale.

.....

.....

.....

.....

.....

.....[4]

[Total: 10]

Reproduction in Humans P2 questions

0/N18/22/Q5

(a) Describe the role of each of the following hormones in the menstrual cycle:

FSH, ...

.....

.....

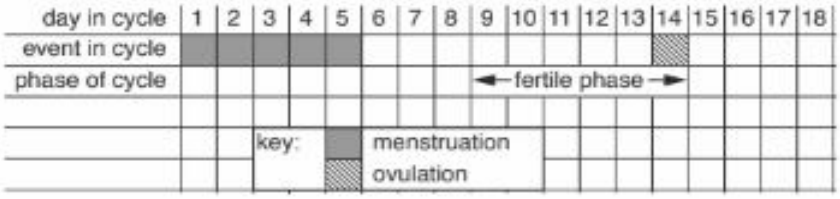
progesterone. .....

.....

.....

[4]

(b) The chart shows the timing and duration of events that take place during **part** of a menstrual cycle.



(i) Suggest why pregnancy may occur if sexual intercourse takes place several days before ovulation.

.....

.....

.....

.....[2]

(ii) Name the method of birth control that makes use of the information in a chart like this. Explain how this method of birth control is used to prevent pregnancy.

name of method .....

explanation.....

.....

.....

.....

[3]

(iii) Suggest why the method of birth control that you have named in **(b)(ii)** is considered to be unreliable.

.....

.....

.....[1]

[Total: 10]

Reproduction in Humans P2 questions

M/J18/21/Q2

The diagram shows a male human gamete.



(a) (i) State the name of the male human gamete.

.....

[1]

The diagram below shows the male reproductive system and associated organs.



(ii) Label with a letter **X** on the diagram where the male gametes are produced.

[1]

(iii) The nucleus of the male gamete is different from the nuclei of other types of cell found at location **X**.

State the cause of this difference and explain its importance in reproduction.

cause of difference .....

.....

.....

explanation .....

.....

.....

.....

.....

[3]

(b) Describe the differences in size and mobility between the male human gamete and the female human gamete.

.....

.....

.....

.....[2]

(c) Complete the paragraph by writing the most appropriate word in each of the spaces.

The fusion of a male human gamete and a female human gamete to form a ..... is called ..... . A ball of cells is then formed that becomes implanted in the wall of the ..... .

[3]

[Total: 10]

Reproduction in Humans P2 questions

M/J18/21/Q5

(a) (i) Describe the main characteristics of a virus.

.....

.....

.....

.....[3]

(ii) The human immunodeficiency virus (HIV) reproduces inside white blood cells and destroys them.

Use your knowledge of the functions of white blood cells to suggest why the virus is named the immunodeficiency virus.

.....

.....

.....[2]

(b) (i) HIV causes a disease called AIDS. The virus may be transmitted during sexual intercourse.

State two methods by which the spread of HIV by sexual intercourse may be controlled.

1 .....

.....

2 .....

.....

[2]

(ii) HIV may be transmitted in other ways.

State two ways, other than during sexual intercourse, by which HIV may be transmitted.

1 .....

.....

2 .....

.....

[2]

[Total: 9]

Reproduction in Humans P2 questions

0/N17/22/Q1

Fig. 1.1 shows stages in the development of human twins.

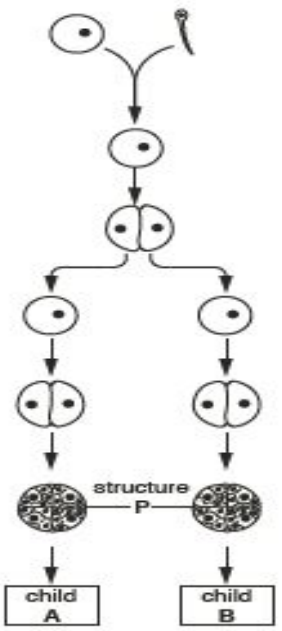


Fig. 1.1

(a) On Fig. 1.1, label and name each of the following:

- a gamete,
- a zygote. [2]

(b) Name the part of the female reproductive system that structure P enters.

.....[1]

(c) If the sex chromosome in the sperm is a Y chromosome, and in the ovum (egg) is an X chromosome, state the sex of child A and of child B. Explain your answer.

child A .....

child B .....

explanation .....

.....

.....

.....

.....

[4]

(d) Explain how a woman's body prevents further ova (eggs) from being released until the end of her pregnancy.

.....

.....

.....

.....

.....[4]

[Total: 11]

Reproduction in Humans P2 questions

O/N16/21/Q4(b)

(b) (i) Many mothers choose to feed their child breast milk rather than bottle milk.

Describe some advantages of breast milk compared with bottle milk.

.....

.....

.....

.....

.....

.....

.....

.....

..... [4]

(ii) Suggest **one** reason why a mother may choose to feed her child bottle milk.

.....

.....

..... [1]

[Total: 11]

Reproduction in Humans P2 questions

O/N16/21/Q6

Syphilis is an infectious disease.

(a) Describe how syphilis is transmitted.

.....

.....

.....

.....

.....

..... [3]

(b) Describe the symptoms, signs and effects of syphilis.

.....

.....

.....

.....

.....

.....

.....

.....

..... [4]

(c) Describe the treatment of syphilis and suggest why it is **not** possible to treat the infection that leads to AIDS in the same way.

.....

.....

.....

.....

.....

..... [3]

[Total: 10]

Reproduction in Humans P2 questions

M/J16/22/Q2

2 Fig. 2.1 shows a fetus developing inside its mother.

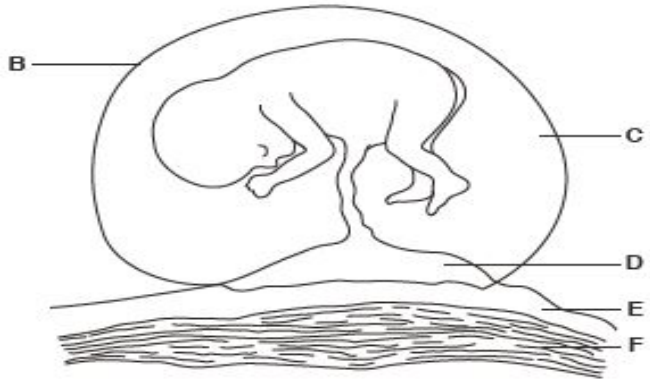


Fig. 2.1

(a) Complete Table 2.1, using letters from Fig. 2.1, to identify each of the following:

Table 2.1

	letter
a structure that contains urea released by the fetus	.....
a region that contains cells, almost all of which could be used for determining the sex of the fetus	.....
a structure that is used to expel the fetus at birth	.....
a temporary structure that would have been expelled during menstruation if pregnancy had not occurred	.....

[4]

(b) Every day, babies are born suffering from severe withdrawal symptoms as a result of their mothers taking drugs during pregnancy.

(i) Name a drug which the mother may have taken during pregnancy that might cause these withdrawal symptoms.

..... [1]

(ii) Suggest how drugs taken by the mother have been able to affect her developing fetus.

.....

.....

.....

.....

.....

.....

.....

.....

.....[4]

[Total: 9]

Reproduction in Humans P2 questions

O/N15/21/Q4

Fig. 4.1 shows changes in the thickness of the uterus lining and in the concentration of progesterone in the blood during the menstrual cycle.

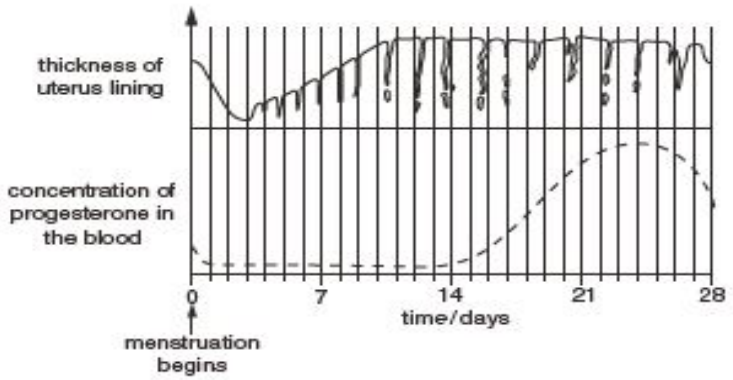


Fig. 4.1

(I) Use Fig. 4.1 to state the time at which each of the following occurs:

the uterus lining reachee maximum thickness

.....

the concentration of progesterone begins to increase.

..... [2]

(II) Draw a (ring) around the day from Fig. 4.1 on which ovulation is most likely to occur.

day 0 day 7 day 14 day 21 day 28

[1]

(III) Explain how it can be concluded from Fig. 4.1 that the person did **not** become pregnant during the 28 days shown, even though ovulation occurred.

.....

.....

.....

..... [2]

(b) The menstrual cycle is controlled by hormones. Name **two** hormones, **other than progesterone**, that control the menstrual cycle. State **one** role of each hormone.

name of hormone

.....

role in the menstrual cycle

.....

.....

name of hormone

.....

role in the menstrual cycle

.....

..... [4]

[Total: 9]

Reproduction in Humans P2 questions

M/J15/21/Q3

Fig. 3.1 shows a fetus developing in the uterus of a mother. The fluid labelled **C** contains cells from the fetus.

A long, hollow needle may be used to withdraw some of the fluid into a syringe. The DNA from the cells in this fluid can then be analysed to find the sex of the fetus and to detect mutations.

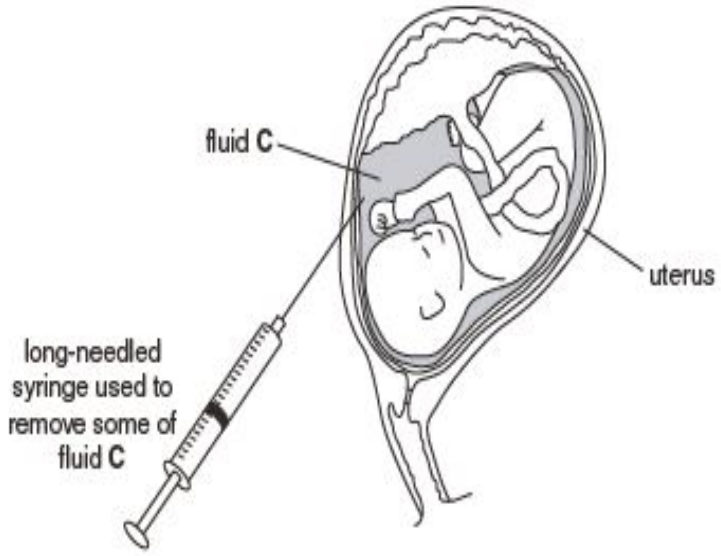


Fig. 3.1

(a) Name fluid **C** and state its function.

name of fluid .....

function .....

..... [2]

(b) **(i)** Label the placenta on Fig. 3.1 using a line and the letter **P**. [1]

(ii) State **two** functions of the placenta.

1 .....

.....

2 .....

..... [2]

Reproduction in Humans P2 questions

(c) Fig. 3.2 shows the chromosomes found in the nucleus of one cell of a developing fetus.

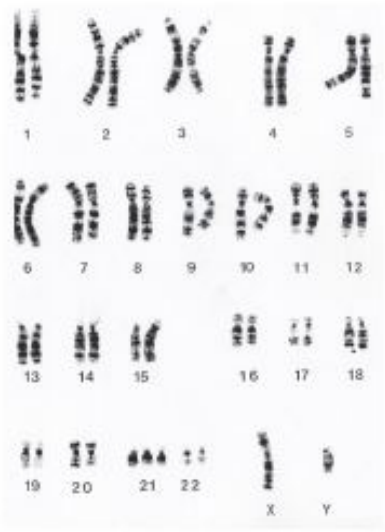


Fig. 3.2

State the sex of this fetus and explain your answer.

sex .....

explanation .....

..... [2]

(d) This fetus has a mutation.

(i) Describe the mutation shown in Fig. 3.2.

.....

.....

.....

..... [2]

(ii) Suggest the condition that this child could be born with as a result of this mutation.

..... [1]

[Total: 10]

Reproduction in Humans P2 questions

M/J15/22/Q9

Syphilis and HIV are both spread by sexual contact.

(a) Describe the cause and symptoms of syphilis.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

..... [6]

(b) State how syphilis is treated.

.....

..... [1]

(c) Discuss how the spread of HIV may be controlled.

.....

.....

.....

.....

.....

..... [3]

[Total: 10]

Reproduction in Humans P2 questions

0/N14/21/Q3

(a) At puberty, hormones are produced that are responsible for the development of secondary sexual characteristics.

(i) Name **one** secondary sexual characteristic in males.

..... [1]

(ii) Name the hormone responsible for the development of secondary sexual characteristics in males.

..... [1]

(iii) Name the organs that produce this hormone. ..... [1]

(b) Fig. 3.1 shows the concentrations in the blood of two hormones, **F** and **G**, involved in a woman's menstrual cycle.

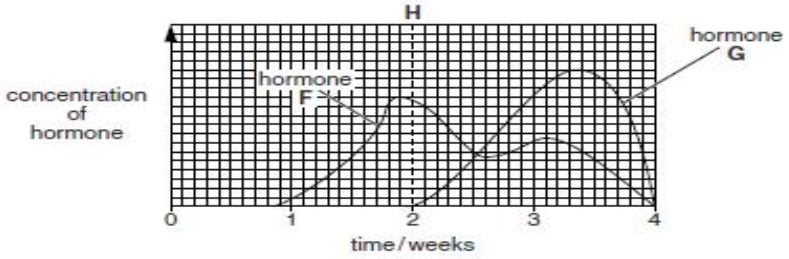


Fig. 3.1

(i) Name the hormones **F** and **G**.

F .....

G ..... [2]

(ii) State what occurs at time **H**. ..... [1]

(c) Fig. 3.2 shows the thickness of the same woman's uterus lining over a 4-week period.

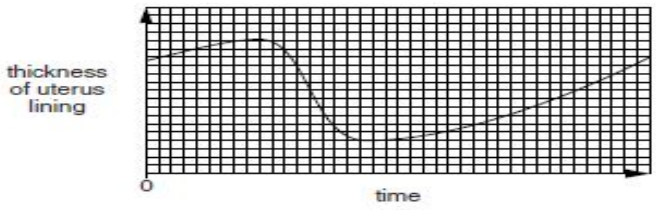


Fig. 3.2

The graph shown in Fig. 3.1 does not begin at the same time as the cycle shown in Fig. 3.2.

Indicate on Fig. 3.2, with a line labelled **J**, the stage shown by line **H** on Fig. 3.1, and explain your reason for choosing this point on the graph.

.....

.....

.....

.....

.....

..... [4]

[Total: 10]

Reproduction in Humans P2 questions

M/J14/22/Q4

4 Fig. 4.1(a) shows the reproductive organs of a man and Fig. 4.1(b) shows the reproductive organs of a woman.

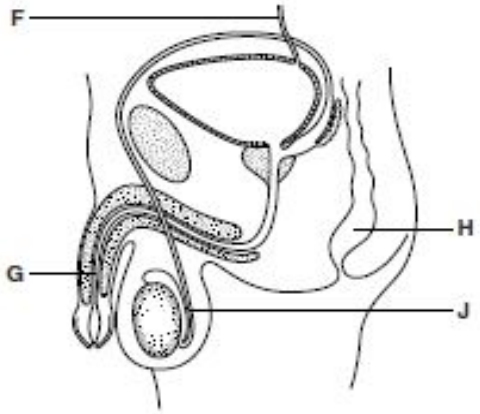


Fig 4.1(a)



Fig. 4.1(b)

(a) Complete Table 4.1, stating the names of the structures in Fig. 4.1(a) and indicating whether they carry urine and/or sperms using yes **or** no as appropriate.

Table 4.1

structure identified by letter	name of structure	carries urine (yes or no)	carries sperms (yes or no)
F			
G			
H			
J			

[4]

(b) Indicate by drawing a line across each of the relevant parts **in both Fig 4.1(a)** and **4.1(b)**, where a cut may be made in order to carry out a form of surgical contraception.

[2]

(c) In older men, the prostate gland tends to increase in size. Suggest an explanation for how this may affect urination.

.....

.....

.....

.....[2]

[Total : 8]

Reproduction in Humans P2 questions

O/N13/22/Q9(a)

(a) Describe the methods by which the spread of human immunodeficiency virus (HIV) may be controlled.

.....

.....

.....

.....

.....

.....

.....

..... [4]

Reproduction in Humans P2 questions

M/J13/21/Q6

(a) The menstrual cycle is controlled by several hormones including FSH and progesterone. Use your knowledge of the role of these hormones in the menstrual cycle to suggest explanations for each of the following.

(i) FSH is given during fertility treatment to women who experience problems becoming pregnant.

.....

.....

.....

.....

.....

.....

..... [3]

(ii) Progesterone is a component of the contraceptive pill.

.....

.....

.....

.....

.....

.....

..... [2]

(b) With reference to **named** substances, describe the functions of the placenta and the umbilical cord.

.....

.....

.....

.....

.....

.....

.....

.....

.....

..... [5]

[Total: 10]

Reproduction in Humans P2 questions

M/J12/21/Q7

7 (a) (i) State **one similarity** and **one difference** in the functions of the urethra in a male and in a female adult person.

similarity .....

.....

difference .....

..... [2]

(ii) State the **differences** between male and female human gametes in terms of size, numbers and mobility.

.....

.....

.....

..... [3]

(b) Describe the **advantages** and **disadvantages** of surgical methods of birth control.

advantages .....

.....

.....

.....

.....

disadvantages .....

.....

.....

.....

.....

.....

..... [5]

[Total: 10]

Reproduction in Humans P2 questions

O/N11/21/Q7

7 **(a)** Describe how a fully-formed fetus in the uterus develops from the time of fertilisation.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....[7]

(b) Describe the disadvantages of feeding a baby with bottle milk.

.....

.....

.....

.....

.....

.....[3]

[Total: 10]

Reproduction in Humans P2 questions

M/J11/21/Q3

3 Fig. 3.1 shows some stages in human reproduction.

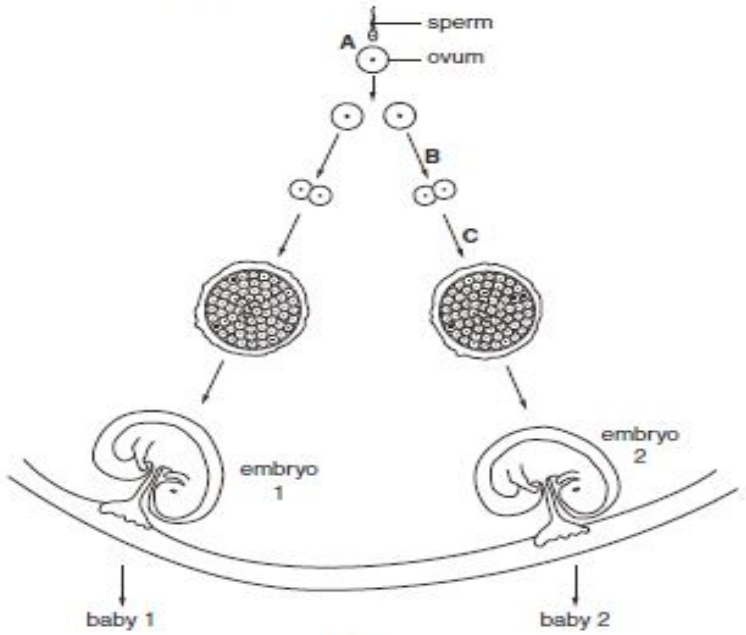


Fig. 3.1

(a) Name the process about to occur at **A** and state where in the reproductive system it normally occurs.

process .....

where it occurs .....[2]

(b) Name the type of cell division taking place at **B** and **C**.

.....[1]

The two embryos develop, are born and grow to become adults.

(c) Suggest two ways in which these two adults must be **similar** to each other, and explain your answers.

1. .....

2. .....

explanation

.....

.....[4]

(d) Suggest two ways in which they may **differ** from one another, and explain your answers.

1. .....

2. .....

explanation

.....

.....[4]

[Total: 11]

Reproduction in Humans P2 questions

Mark Scheme

Mark schemes will use these abbreviations:
; separates marking points
/ alternatives
() contents of brackets are not required but should be implied
R reject
A accept (for answers correctly cued by the question, or guidance for examiners)
Ig ignore (for incorrect but irrelevant responses)
AW alternative wording (where responses vary more than usual)
AVP alternative valid point (where a greater than usual variety of responses is expected)
ORA or reverse argument
underline actual word underlined must be used by candidate
+ statements on both sides of the + are needed for that mark

O/N18/22/Q2

2(a)(i) (E) urethra ;

(F) bladder ;

(G) kidney ;

(H) ureter ;

R gall (bladder)

2(a)(ii) semen / seminal fluid / sperm / gametes + carried by E / not carried by

H ; 1

2(b)(i) (contains) glucose ; 1

2(b)(ii) insulin gene ; from + human + DNA / chromosome / genome ; To + bacterial + DNA / chromosome / genome / plasmid ; fermenter ; reproduce / multiply / divide / mitosis / binary fission
Ig fermentation

O/N18/22/Q5

5(a) (FSH)

Reproduction in Humans P2 questions

follicle / egg / ovum + develops / matures / grows ; ovary ; oestrogen + production / release ; (progesterone) maintains AW uterus + lining / wall ; implantation / pregnancy ; stops LH/FSH + production / release ;

5(b)(i) fertile ;

sperm in

+ female / vagina / uterus / oviduct / fallopian tube ;sperm survive

+ several days / until ovulation AW / until day 14 ;

5(b)(ii) (name of method)

natural / rhythm / calendar ;

(explanation)

have intercourse outside fertile phase / avoid intercourse in fertile phase ;

no sperm present

+ at same time as egg / at ovulation / on day 14 ;

no fertilisation / no fusion of gametes ;

5(b)(iii) cycles / periods AW

+ irregular / vary in length ;

fertile phase / ovulation

+ on different days ;

data / chart / information + not be available ; sperm may survive for a long time AW

M/J18/21/Q2

2(a)(i) sperm **; 1**
2(a)(ii) testis correctly labelled with **X ; 1**
2(a)(iii) sperm cells / gamete **+** meiosis **OR** other cells **+** mitosis **;**
different allele combinations on chromosomes **;**
reference to (nucleus of sperm) haploid / half number **AW ;**
reference to restoration of diploid / full number **AW ;**
(upon) fertilisation / fusion of gametes **;**
3 Marks can be awarded under *cause of difference* or *explanation*
2(b) male / sperm **+** small(er) **;**
male / sperm **+** motile / mobile / can swim **AW ;**
2
2(c) zygote **;**
fertilisation **;**

uterus / womb **;**

M/J18/21/Q5

5(a)(i) very **AW** small **;**
protein coat / capsid **;**
no membrane ***/*** no cytoplasm / no nucleus / non-cellular ***/*** no organelles **;**
nucleic acid / DNA / RNA **;**
parasitic / (may be) pathogen(ic) / cause disease / non-living **AW ;**
unaffected by antibiotics **;**
3
5(a)(ii) reference to immune / immunity (system or affected) **;**
reference to reduced **AW +** antibody production **;**
reference to reduced **AW +** phagocytic action **;**
2
5(b)(i) barrier contraception / correct named contraceptive method e.g. condom **;**
abstinence **;**
only one partner **AW ;**
reference to use of anti-retroviral drugs **; 2 A** avoid unprotected sex
5(b)(ii) sharing **+** needles / sharp objects / toothbrushes **;**
blood transfusion / contact **;**
from mother to baby / across placenta / during birth / during breast-feeding **;**

O/N17/22/Q1

1(a) gamete / egg / ovum / sperm correctly named and labelled **;**
zygote correctly named and labelled **;**
2
1(b) uterus / womb / endometrium **; 1**
1(c) *(child **A**)* male **;**
*(child **B**)* male **;**
(explanation)
1 zygote **+** X **+** Y **;**
2 mitosis **;**
3 identical **+** cells / twins **;**
4 A boy / son for both
1(d) **1** yellow body / follicle / corpus luteum / ovary **;**
2 placenta **;**
3 progesterone **;**
4 inhibited / less / no **+** FSH / LH **+** production / release **;**
5 FSH / LH **+** pituitary **;**
6 FSH **+** ovum / egg **+** maturation / development **;**
7 LH **+** ovum / egg **+** release **;**

O/N16/21/Q4(b)

4(b)(i) sterile / not contaminated / no additives **;**
antibodies / hormones **;**
no need to warm / at correct temperature **;**
bonding between mother and child **;**
better proportions of nutrients **AW ;**
does not cost money **;**
supply / availability on demand **;**
4
4(b)(ii) lack of awareness of the benefits **;**

mother unable / chooses not

to breast-feed **;**
reference to advertising by bottle milk providers **;**
not available to do so (e.g. at work / child in care) **;**
infection / drug addiction / damaged nipples **;**
mother does not produce (enough) milk **;**

M/J16/22/Q2

2 (a) C / D / E ;
C / D ;
F ;
E ;
[4]
(b) (i) heroin / alcohol / nicotine / named
addictive drug ;
[1]
(ii) Ig reference to named drug /
substance (e.g. CO, tar)
mother's blood ;
diffusion ;
across or through placenta ;
fetus / baby / embryo + blood ;
umbilical cord / umbilical vein ;

O/N15/21/Q4

4 (a) (i) 11 / 12 day(s) ;
13 / 14 day(s) ;
[2]
A 11th or 12th day
(ii) day 14 ; [1]
(iii) progesterone (concentration) falls / not maintained ;
ref. figure day 24 – 28 ;
progesterone needed to maintain lining / pregnancy ;
[max. 2]
(b) FSH ;
development of follicle / maturation / release of egg / ovum ;
stimulates production of oestrogen ;
oestrogen ;
repairs / builds up / thickens / develops uterus lining ;
maturation of egg / ovum ;
inhibits production of FSH ;
stimulates production of LH ;
LH ;
ovulation / release of egg / ovum ;
[1]
[max. 1]
[1]
[max. 1]
[1]
[1]
[max. 4]
A oestradiol for oestrogen

Reproduction in Humans P2 questions

Throughout

M/J15/21/Q3

3 (a) amniotic ;
prevents physical harm / damage to
fetus ;
[2]
(b) (i) placenta correctly labelled ;
[1]
(ii) exchange / passage in correct direction
of
+ nutrients / named ;
+ gases / named ;
+ excretory products / named ;
+ antibodies ;
ref. prevent mixing of maternal and
fetal blood ;

(c) male ;
presence of Y (chromosome) ;
R gene
[2]
(d) (i) one extra chromosome / trisomy / three
not two / 47 not 46 ;
position / pair 21 ;
[2]
(ii) Down's syndrome ;

M/J15/22/Q9

9 (a) 1. bacterium / spirochaete /
Treponema ;
2. ulceration / chancre / sore + on
contact part of body ;
3. swollen lymph glands ;
4. rash / description ;
5. flu-like symptoms / examples ;
6. weight loss ;
7. hair loss ;
8. numbness / paralysis / loss of
coordination ;
9. stroke ;
10. dementia ;
11. blindness ;
12. deafness ;
13. heart disease ;

5. raised temperature / fever /
headache / sore throat
[max 6]
(b) antibiotic / named antibiotic ;

(c) 1. drugs (antiretrovirals / ARVs) can
contain the disease ;
2. stick to one partner / avoid casual
sex ;
3. abstinence ;
4. barrier contraception AW ;
5. screen blood ;
6. don't share / sterilise + needles /
razors / surgical equipment /
toothbrushes ;
7. HIV testing / contact tracing ;
8. education ;
4. Ig contraception unqual
[max 3]

O/N14/21/Q3

3 (a) (i) deeper voice / hair on face or named body part / stronger
muscles / sperm production / larger genitalia ;
[1]
A broadening of shoulders
(ii) testosterone ; [1]
(iii) testes ; [1] A testicles / gonads
(b) (i) F – oestrogen ;
G – progesterone ;
[2]
(ii) ovulation / release of egg or ovum ; [1]
(c) line drawn at 3 weeks ± 2 squares ;
uterus (lining) increasing in thickness ;
in preparation for receiving (fertilised) ovum / egg ;
ref. time + menstruation ;
[4]
A zygote / embryo
[Total: 10]

M/J14/22/Q4

4 (a)
structure
identified by
letter
name of
structure
carries urine
(yes or no)
carries
sperms (yes
or no)
F ureter yes no

G urethra yes yes
H rectum no no
J vas
deferens /
sperm duct
no yes
[4]
1 mark per correct row ;
spelling of ureter and urethra must be correct
(b) line drawn across sperm duct ;
line drawn across oviduct ;
[2] R if more than one line drawn on each Fig.– unless
across same structure
R if more than one structure cut
Ig skin cuts
(c) closes / restricts AW the urethra ;
adverse effect on urination AW ;
[2]
Ig ref bladder
Ig refs to pain on urination

O/N13/22/Q9(a)

9 (a) screening blood;
being HIV tested / contact tracing;
avoidance of needle/syringe sharing;
needle exchange schemes / sterilising needles;
condoms / femidoms;
limited partners / no intercourse with prostitutes (who may have multiple partners);
abstinence;
ref. education (about how HIV is spread);
take drugs / follow treatment prescribed (to prevent spread within body); [max 4]

M/J13/21/Q6

6 (a) (i) (FSH) stimulates follicle to develop / egg to develop /
helps to increase numbers of eggs released;
(FSH) stimulates secretion / release of oestrogen;
oestrogen stimulates secretion / release of LH;
LH stimulates ovulation / release of egg;
[max 3]
(ii) (progesterone) prevents / inhibits secretion of FSH;
follicle does not develop / egg unable to mature
/ prevents ovulation A/W;
fertilisation / pregnancy does not occur;
[max 2]
(b) prevent mixing of maternal and fetal blood;

allow exchange A/W of substances between maternal and fetal blood;
dissolved;
named nutrient;
named gas;
named excretory product;
antibodies / hormones;
[max 5]
Accept nitrogenous waste

M/J12/21/Q7

7 (a) (i) carries urine (R just urea) in male and female;
carries semen / sperms / gametes AW in male; [2]
(ii) ref. size comparison;
ref. qualified numbers comparison;
ref. mobility comparison; [3]
(b) (advantages)
only needs to be undergone once AW (e.g. less trouble);
high reliability / effectiveness AW; [2]
(disadvantages)
does not protect against sexually transmitted diseases;
ref. risks of surgery / anaesthetic;
not a temporary solution;
difficult / expensive to reverse;
need access to medical services AW; [4 max]

O/N11/21/Q7

7 (a) zygote;
division;
mitosis (A anywhere);
blastocyst or described;
implantation AW;
in uterus lining (R wall);
placenta;
membrane(s) or named/amnion/amniotic sac;
named food substance/minerals;
oxygen;
nitrogenous excretion/urea/CO_2;
diffusion;
development of organs/named organs/cells or tissues become specialised; [max 7]
(b) might not be sterile/A ref. possible contamination;
no antibodies;
needs warming/temperature ref.;
less satisfactory bonding;
can lead to obesity in later life AW/wrong proportions of nutrients;
expensive;
supplies may be limited; [max 3]

M/J11/21/Q3

(a) fertilisation;
oviduct / Fallopian tube; [2]
(b) mitosis; [1]

Reproduction in Humans P2 questions

(c) any 2 genetic similarities
(e.g. sex/eye colour/blood groups/shape of ears/nose etc.)/same genes* once only/
R look alike/same age/same chromosomes;;
characters caused by genes only;
have both inherited identical/same genes* once only;
they both arise from the same zygote/one sperm + one egg; [max 4]
(d) any two environmentally affected characters (e.g. size/weight/hair colour)
R different traits unqualified/intelligence;;
ref. to environment/genes only partly responsible;
named relevant environmental factor e.g. amount of sun light/lack of food etc.; [4]

Reproduction in plants

(a) define *mitosis* as cell division giving rise to genetically identical cells in which the chromosome number
is maintained and state the role of mitosis in growth, repair of damaged tissues, replacement of worn out cells and asexual reproduction
(b) define *asexual reproduction* as the process resulting in the production of genetically identical offspring from
one parent and describe **one named**, commercially important application of asexual reproduction in plants
(c) define *meiosis* as a reduction division in which the chromosome number is halved from diploid to haploid
(d) state that gametes are the result of meiosis (reduction division)
(e) define *sexual reproduction* as the process involving the fusion of haploid nuclei to form a diploid zygote
and the production of genetically dissimilar offspring
(f) identify and draw, using a hand lens if necessary, the sepals, petals, stamens and carpels of **one**, locally
available, **named**, insect-pollinated, dicotyledonous flower, and examine the pollen grains under a light
microscope
(g) state the functions of the sepals, petals, anthers and carpels
(h) use a hands lens to identify and describe the anthers and stigmas of **one**, locally available, **named**,
wind-pollinated flower, and examine the pollen grains under a light microscope
(i) outline the process of pollination and distinguish between self-pollination and cross-pollination
(j) compare, using fresh specimens, an insect-pollinated and a wind-pollinated flower
(k) describe the growth of the pollen tube and its entry into the ovule followed by fertilisation (production of
endosperm and details of development are **not** required)
(l) investigate and describe the structure of a non-endospermic seed in terms of the embryo (radicle, plumule and cotyledons) and testa, protected by the pericarp (fruit wall)
(m) state that seed and fruit dispersal by wind and by animals provides a means of colonising new areas
(n) describe the external features of **one**, locally available, **named** example of a wind-dispersed fruit or
seed and of **one named** example of an animal-dispersed fruit or seed
(o) investigate and state the environmental conditions that affect germination of seeds: suitable temperature, water and oxygen
(p) describe the uses of enzymes in the germination of seeds

O/N18/21/Q1

The diagram shows the parts of a plant growing above ground.



(a) (i) State the type of reproduction that takes place using the flower shown in the diagram.

..... [1]

(ii) Describe the events that must take place for the flower to develop into a fruit.

.....

.....

.....

.....

.....

.....

..... [5]

(b) The plant may also reproduce without using a flower, to produce new plants from plantlets.

State the type of reproduction that produces the plantlets.

..... [1]

(c) Suggest the advantages to the plant of reproducing by each of the following methods:

using flowers, ...

.....

.....

using plantlets. .....

.....

.....

[3]

[Total: 10]

O/N18/21/Q2

The diagram shows a seed (Fig. 1) and a plant developing from this seed (Fig. 2).

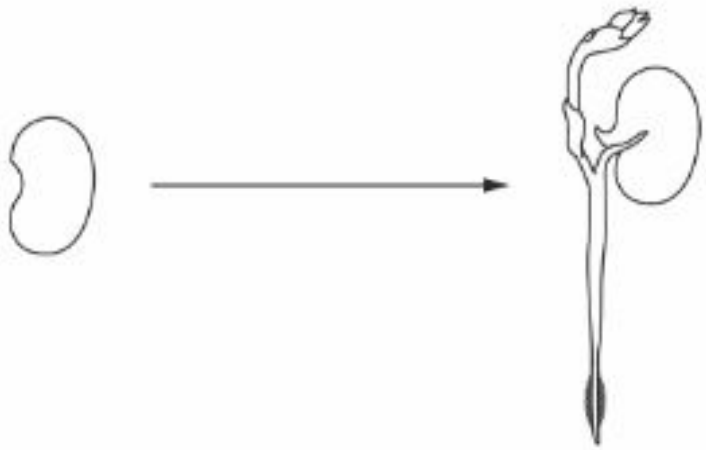


Fig. 1 **Fig. 2**

(a) (i) Name **two** structures visible in Fig. 2 that are **not** visible in Fig. 1.

1 .....

2 ..... [2]

(ii) Name the process represented by the arrow drawn between Fig. 1 and Fig. 2.
Describe the use of enzymes in this process.

name of process .....

use of enzymes .....

.....

.....

.....

[4]

(b) In an experiment, the growth of a plant from a seed is found to be faster as temperatures increase up to 35 °C.

Explain how the development of a plant from a seed would be affected by a temperature much higher than 35 °C.

.....

.....

..... [2]

[Total: 8]

O/N18/22/Q3

The diagram shows a pollen grain with a pollen tube growing from it.



Pollen grains from the same type of plant were placed in sucrose solutions of different concentrations for a fixed amount of time. After this time, the pollen grains and tubes were examined using a microscope. The following observations were made for each concentration of sucrose:

- the number of pollen grains that had germinated to produce a pollen tube,
- the length of each pollen tube.

The table shows the results of the investigation.

% sucrose concentration	% of pollen grains germinated	mean pollen tube length/mm
1	6	0.005
2	13	0.008
4	25	0.015
8	56	0.040
10	31	0.030
20	25	0.018
40	13	0.006

(a) (i) A total of 12 pollen grains were placed in the 20% sucrose solution.

Use the information in the table to calculate the number of pollen grains that germinated to produce a pollen tube in the 20% sucrose solution.

..... [1]

(ii) Suggest why the **mean** pollen tube length was calculated for each sucrose concentration.

.....

.....[1]

(iii) Use the information in the table to suggest the optimum (best) concentration of sucrose solution for pollen tube germination and growth.

..... %

Explain how the information in the table enabled you to reach this conclusion.

.....

.....

.....

[3]

(iv) The germination of a pollen grain to form a pollen tube requires the movement of water into the pollen grain from its surroundings.

Suggest why placing a pollen grain in a solution with a higher sucrose concentration than in your answer to **(a)(iii)** may result in a lower percentage of germination.

.....

.....

.....

.....

.....[3]

(b) Describe the route taken by a growing pollen tube in a plant and explain its importance in plant reproduction.

.....

.....

.....

.....

.....

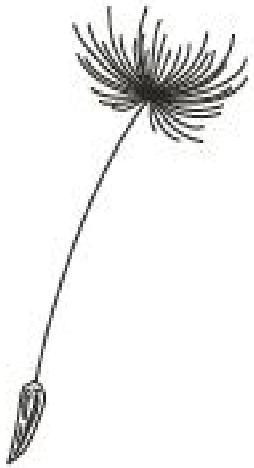
.....

.....[4]

[Total: 12]

M/J18/21/Q3

The diagram shows the fruit of a plant.



(a) Suggest why this fruit is most likely to be wind-dispersed.

.....

.....

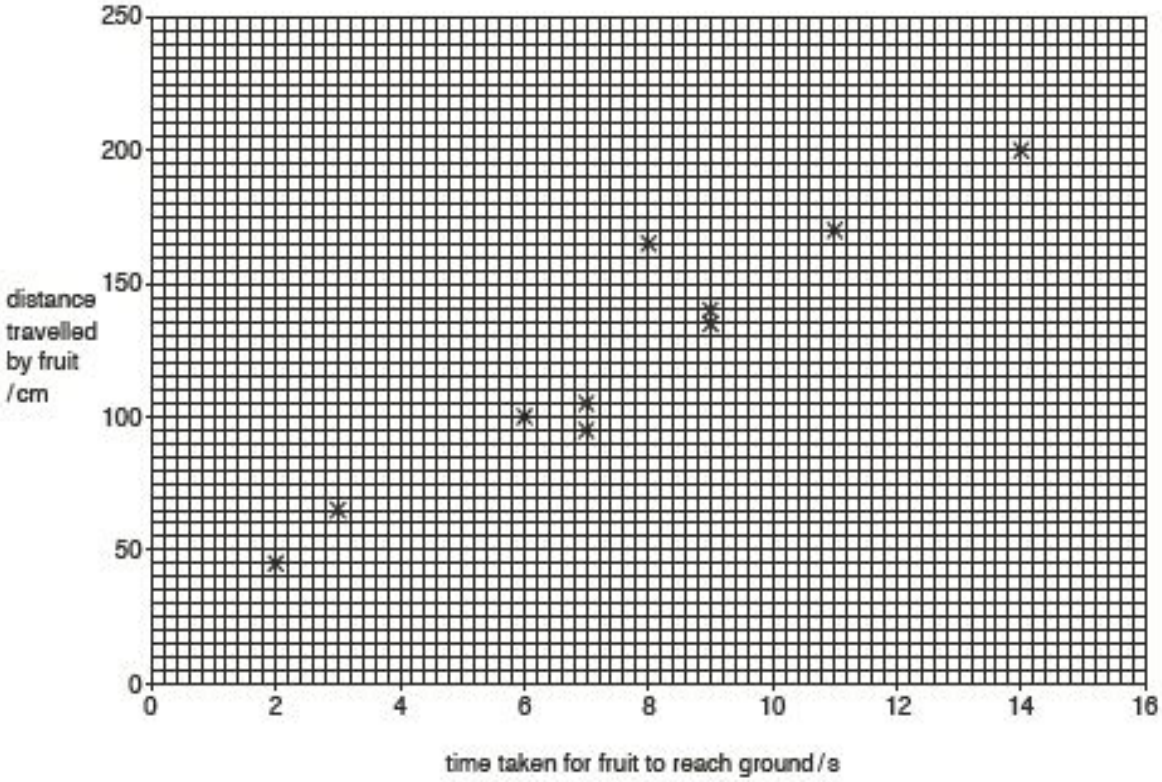
.....

.....

.....[3]

(b) An investigation was carried out to find the time taken for several of these fruits to reach the ground when dropped from the same height. The horizontal distance travelled by each fruit in that time was also measured.

The results of the investigation are shown in the graph.



(i) Describe the pattern shown by the results in the graph.

.....

.....[1]

(ii) State the number of fruits in the investigation that took between 4 and 10 seconds to reach the ground.

..... [1]

(iii) Suggest and explain advantages to the plant of its fruits taking a longer time to reach the ground.

.....

.....

.....

.....

.....

.....[4]

(c) When a fruit of the plant reaches the ground, the process of germination to form a new plant may take place.

State one environmental condition that affects germination and explain the importance of this condition.

environmental condition .....

explanation .....

.....

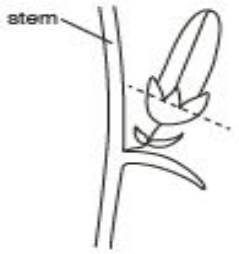
[2]

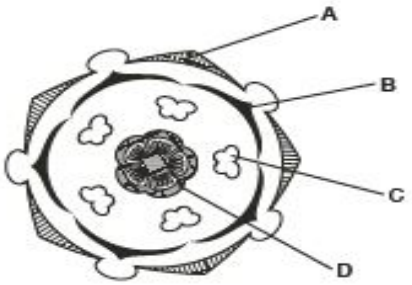
[Total: 11]

Reproduction in plants P2 questions 5090

M/J18/22/Q1

The diagrams show the bud of an insect-pollinated flower and a magnified transverse section through the same flower bud. The transverse section was taken at the position shown by the dotted line.



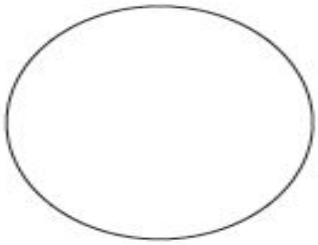


(a) Complete the table to show the name of each of structures A to D and to state one function of each structure.

letter	name of structure	function
A		
B		
C		
D		

[8]

(b) The diagram shows an incomplete transverse section through the stem of this plant.



(i) Complete the diagram by drawing and labelling the positions of each of the following tissues:

- xylem,
- phloem.

[2]

(ii) State one function of xylem tissue.

.....

.....[1]

[Total: 11]

Reproduction in plants P2 questions 5090

O/N17/21/Q5

Fig. 5.1 shows the fruits of two plants, **A** and **B**. Both fruits are animal-dispersed.



fruit A fruit B

Fig. 5.1

With reference to the features shown in Fig. 5.1, describe how these fruits are dispersed.

.....

.....

.....

.....

.....

.....

.....

.....[5]

[Total: 5]

M/J17/21/Q5

The statements **E** to **K** relate to the process of reproduction.

E produces genetically identical offspring

F produces more individuals of the same species

G involves only one parent

H involves fusion of nuclei

I requires gametes

J forms a diploid zygote

K involves only cell division by mitosis

Table 5.1 shows a comparison of sexual and asexual reproduction.

Table 5.1

sexual reproduction only	asexual reproduction only	both sexual and asexual reproduction
	E	

Complete Table 5.1 by writing each letter in the correct box to match it to sexual reproduction only, asexual reproduction only, or to both.

The first letter has been written in the correct box for you. Use each letter **once** only. [6]

[Total: 6]

M/J17/22/Q3

Fig. 3.1 shows flowers from the same species of plant at different stages, D and E, in their development.

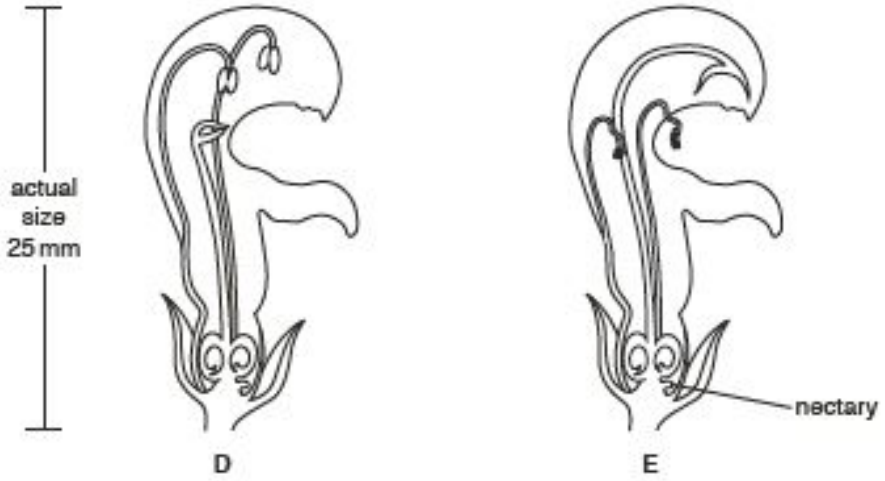


Fig. 3.1

(a) On Fig. 3.1, use lines labelled S and C to label a sepal (S) and a carpel (C). [2]

(b) The flowers are cross-pollinated by an insect. Explain why the insect must visit flower D before visiting flower E.

.....

.....

.....

.....[3]

(c) Suggest how flowers of this species are adapted to be pollinated by an insect such as a bee.

.....

.....

.....

.....

.....

.....[4]

[Total: 9]

M/J17/22/Q7

(a) Fig. 7.1 shows a section through a fruit.

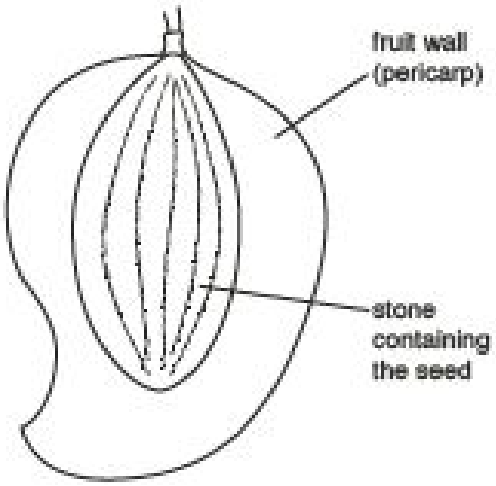


Fig. 7.1

The seed and the fruit wall are genetically different. Explain how this difference is produced.

.....

.....

.....

.....

.....

.....[4]

(b) Describe and explain the differences between wind-dispersed and animal-dispersed fruits.

.....

.....

.....

.....

.....

.....

.....

.....

.....[6]

[Total: 10]

Reproduction in plants P2 questions 5090

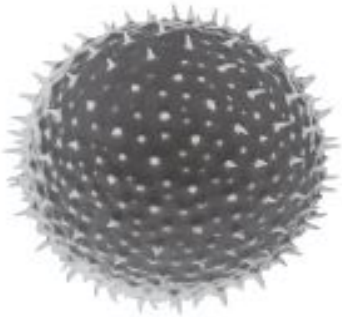
O/N16/21/Q2

Fig. 2.1 shows a magnified pollen grain from each of two plant species, **A** and **B**.



magnification ×830

pollen grain from plant species **A**



magnification ×200

pollen grain from plant species **B**

Fig. 2.1

(a) (i) Use the information in Fig. 2.1 and your biological knowledge to describe **three** differences between the pollen grains from species **A** and species **B**.

Write your answers in Table 2.1.

Table 2.1

pollen grain from species **A**	pollen grain from species **B**

[3]

(II) Cross-pollination takes place in both species **A** and species **B**.

Describe what is meant by the term *cross-pollination*.

.....

.....

.....

.....

.....

.....

..... [3]

(III) Using the information provided by Fig. 2.1, describe how cross-pollination is most likely to occur in species **A** and in species **B**.

species **A**

.....

.....

.....

.....

species **B**

.....

.....

.....

.....[3]

(b) Fig. 2.2 is a photograph of the flowers of species **A**.



Fig. 2.2

List **two** features that would be present in the flowers of species **B** that are **not** present in those of species **A**.

1 .....

2 ..... [2]

[Total: 11]

Reproduction in plants P2 questions 5090

M/J16/21/Q2

Dry mass is the mass of all chemicals, excluding water, present in an organism.

Fig. 2.1 shows the stages of germination of a seed. Fig. 2.1 also shows the changes in dry mass of the plant during these stages of germination.

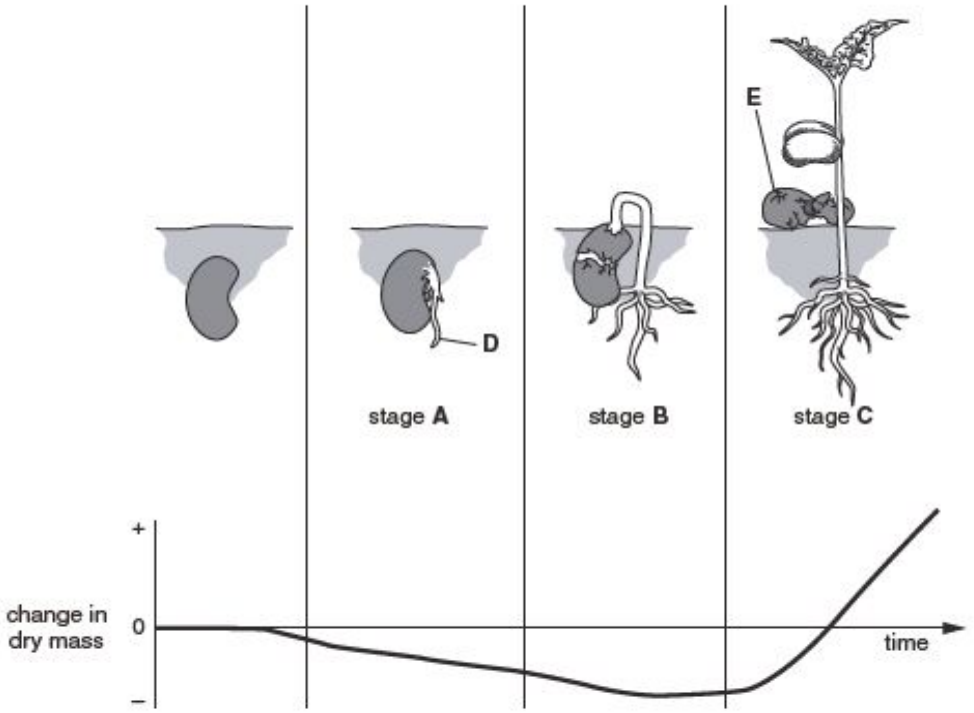


Fig. 2.1

(a) Name the parts labelled **D** and **E** in Fig. 2.1.

D .....

E ..... [2]

(b) Describe and explain the changes in dry mass shown during each of the stages **A**, **B** and **C** in Fig. 2.1.

stage **A** .....

.....

.....

.....

.....

stage **B** .....

.....

.....

.....

.....

stage **C** .....

.....

.....

.....

..... [6]

(c) Water is needed for germination of seeds.

State **two** other conditions needed for germination. Explain why each condition is needed.

condition .....

explanation .....

.....

.....

condition .....

explanation .....

.....

..... [4]

[Total: 12]

Reproduction in plants P2 questions 5090

M/J16/22/Q1

The grape plant has many flowers clustered together on each flowering head. Fig. 1.1 shows the structure of one mature grape flower.

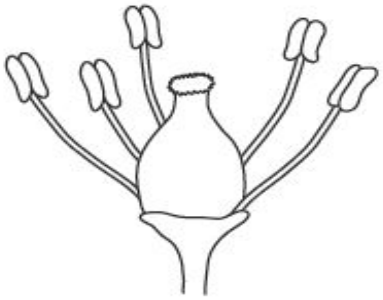


Fig. 1.1

(a) **(i)** Name **two** parts, normally found in other flowers, that are missing from this mature flower.

1 .....

2 ..... [2]

(ii) Suggest the type of pollination found in the grape plant and give a reason for your choice.

type of pollination .....

reason .....

.....[2]

(b) Fig. 1.2 shows a section through a fruit that develops from the same flower.

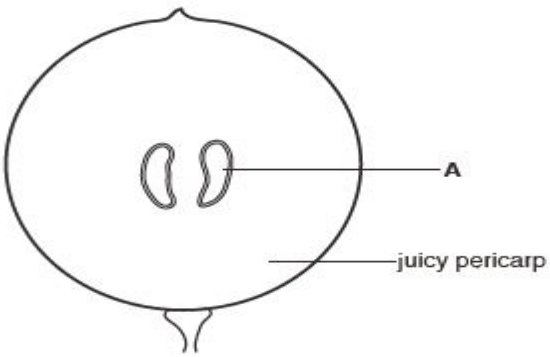


Fig. 1.2

(i) Name the structure labelled **A** in Fig. 1.2. ..... [1]

(ii) Suggest how part **A** is dispersed and give reasons for your answer.

.....

.....

.....

.....

.....

.....

.....[3]

Reproduction in plants P2 questions 5090

O/N15/22/Q1

Fig. 1.1 shows a carpel of a flower with two pollen grains on top.

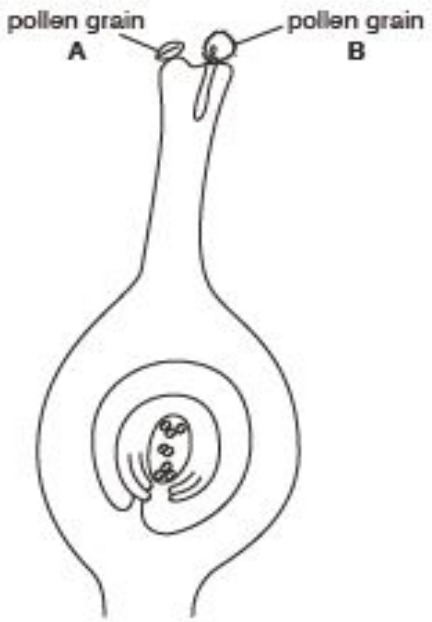


Fig. 1.1

(a) Name each of the following:

(i) the process that has brought the pollen grains to the carpel

.....[1]

(ii) the part of the carpel to which the pollen grains are attached.

.....[1]

(b) On Fig. 1.1, draw a line to show the route taken by the pollen tube up to the point at which male and female gametes fuse. [3]

(c) Name each of the following:

(i) a part of the carpel where the nuclei are all **diploid**

.....[1]

(ii) a part of the carpel that contains **haploid** nuclei.

.....[1]

(d) Suggest why pollen grain **A** has not developed a pollen tube.

.....

.....[1]

[Total: *8*]

Reproduction in plants P2 questions 5090

O/N15/22/Q9

(a) Outline the processes of *mitosis* and *meiosis*, including references to where they occur.

.....

.....

.....

.....

.....

.....

.....

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.....

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.....

.....

.....

.....

.....[7]

(b) Describe the advantages of asexual reproduction in plants with reference to a **named** commercially important application.

.....

.....

.....

.....

.....

.....

.....

.....[3]

[Total: 10]

Reproduction in plants P2 questions 5090

M/J15/21/Q8

(a) Describe the external features of **one named** example of a wind-dispersed fruit or seed. State the importance to the plant of this method of dispersal.

.....

.....

.....

.....

.....

.....

.....

.....

.....

..... [5]

(b) State **two** environmental conditions that affect the germination of seeds. Describe the importance of each condition.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

..... [5]

[Total: 10]

Reproduction in plants P2 questions 5090

M/J15/22/Q6

(a) For a **named** fruit or seed, describe how it is adapted for animal dispersal.

.....

.....

.....

.....

.....

.....

.....

..... [4]

(b) A student planted seeds from different types of plant in the same area of soil.

(I) Suggest why some of the seeds did not germinate.

.....

.....

.....

..... [2]

(II) Explain why several of the seedlings were unable to survive after a few weeks.

.....

.....

.....

.....

.....

.....

.....

..... [4]

[Total: 10]

Reproduction in plants P2 questions 5090

O/N14/21/Q8

(a) (I) Explain how meiosis is involved in the formation of gametes.

.....

.....

.....

..... [2]

(II) Explain how two plants, one with red flowers and one with white flowers, can produce seeds that will grow into plants with either red or white flowers in the ratio of 1:1.

.....

.....

.....

.....

.....

.....

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.....

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.....

.....

..... [6]

(b) Suggest how two plants, of a different species, one with red and one with white flowers, could produce seeds that will grow into plants with pink flowers.

.....

.....

.....

.....

..... [2]

[Total: 10]

Reproduction in plants P2 questions 5090

O/N14/22/Q6

(a) Describe the differences between an ovule, a seed and a fruit.

.....

.....

.....

.....

.....

.....

.....

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.....

.....

.....

..... [6]

(b) Explain how fruits or seeds may be modified for dispersal by wind.

.....

.....

.....

.....

.....

.....

.....

..... [4]

[Total: 10]

Reproduction in plants P2 questions 5090

M/J14/21/Q7

(a) Compare the processes of mitosis and meiosis.

.....

.....

.....

.....

.....

.....

.....

.....[4]

(b) Use your knowledge of how sex is inherited to explain which parent determines the sex of a child.

.....

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.....

.....

.....

.....

.....[6]

[Total: 10]

Reproduction in plants P2 questions 5090

M/J14/22/Q3

Fig. 3.1 shows a flowering head of wheat, and individual flowers before and after opening.

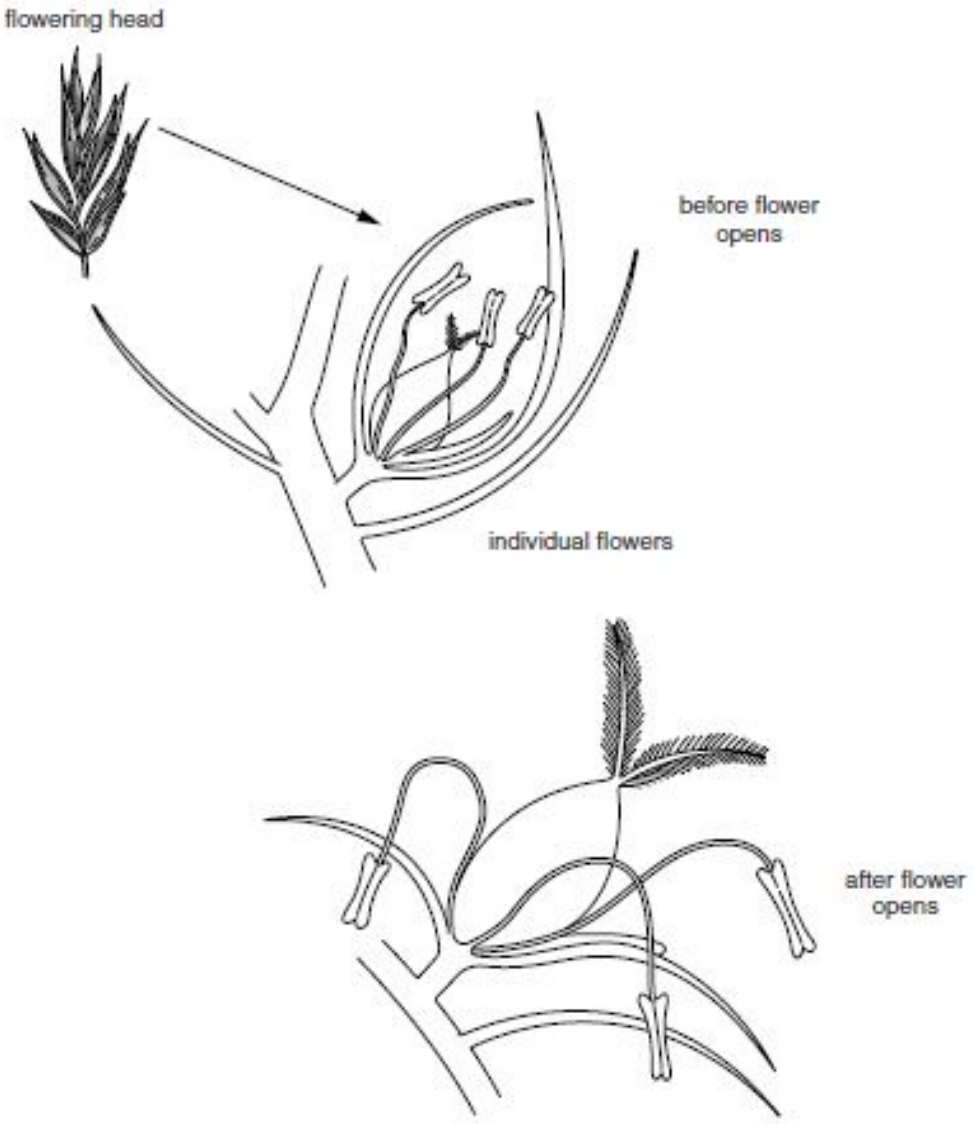


Fig. 3.1

The anthers release most of their pollen before the flower opens. The rest is released after the flower opens.

Reproduction in plants P2 questions 5090

(a) Name the type of pollination found in the wheat plant before the flower opens.

.....

[1]

(b) **(I)** Using the information provided by Fig. 3.1, describe pollination in the wheat plant after the flower opens.

.....

.....

.....

.....

.....[3]

(II) Wheat pollen is relatively heavy and is released for only a few hours after the flowers open.

Suggest **two** disadvantages of this.

.....

.....[2]

(c) Scientists are working to introduce genes into wheat plants to make them resistant to attack by insect pests (greenfly) and to encourage root nodule bacteria from pea and bean plants to live in their roots.

(I) Name the type of experimental work in which these scientists are involved.

.....

[1]

(II) Suggest how the growth of root nodule bacteria on the roots of wheat plants could reduce the amount of fertiliser required by a growing wheat crop.

.....

.....

.....

.....

.....

.....

.....

.....

.....[5]

[Total:12]

Reproduction in plants P2 questions 5090

O/N13/21/Q8

(a) Explain the importance of *meiosis* in sexual reproduction.

.....

.....

.....

.....

.....

.....

.....

.....

.....

..... [4]

(b) Fruits and seeds may be dispersed by the wind.

Describe the features of a **named** wind-dispersed fruit or seed and explain the importance of these features in the process of dispersal.

.....

.....

.....

.....

.....

.....

.....

.....

.....

..... [6]

[Total: 10]

Reproduction in plants P2 questions 5090

O/N13/22/Q8(a)

(a) Describe the part played by an ovule in the reproduction of a plant.

.....

.....

.....

.....

.....

.....

.....

.....[4]

Reproduction in plants P2 questions 5090

M/J13/21/Q3

(a) Fig. 3.1 shows how pollination takes place in two different species of plant, species **P** and species **Q**.

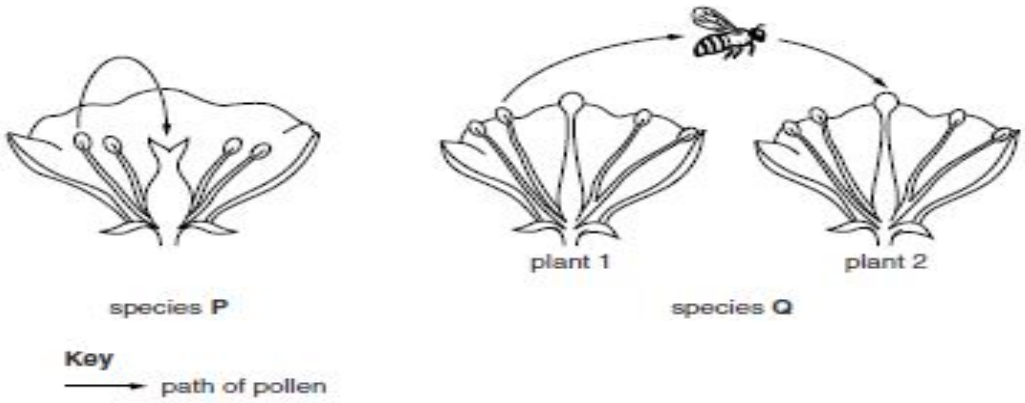


Fig. 3.1

(I) Using the information in Fig. 3.1, suggest and explain how each of these species of plant is pollinated.

species **P**

.....

.....

species **Q**

.....

.....

[4]

(II) Suggest **two** ways in which a flower from a plant of species **Q** in Fig. 3.1 may be adapted to increase the likelihood of pollination taking place.

1. .....

2. .....

[2]

(b) State why species **Q** shows more variation in its phenotype than species **P**.

.....

.....[1]

(c) Describe the events that take place in a flower after pollination until fertilisation has taken place.

.....

.....

.....

.....

.....

.....[3]

[Total: 10]

Reproduction in plants P2 questions 5090

M/J13/22/Q6

(a) Crops can be grown under controlled conditions in large buildings.

Describe and explain how such buildings can provide the conditions needed for maximum crop production.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....[7]

(b) Suggest why seeds from crops grown in this way may produce fewer offspring and only small variations compared with crops grown naturally.

.....

.....

.....

.....

.....[3]

[Total: 10]

Reproduction in plants P2 questions 5090

MARK SCHEME

Mark schemes will use these abbreviations:

; separates marking points

/ alternatives

() contents of brackets are not required but should be implied

R reject

A accept (for answers correctly cued by the question, or guidance for examiners)

Ig ignore (for incorrect but irrelevant responses)

AW alternative wording (where responses vary more than usual)

AVP alternative valid point (where a greater than usual variety of responses is expected)

ORA or reverse argument

underline actual word underlined must be used by candidate

+ statements on both sides of the

+ are needed for that mark

0/N18/21/Q1

1(a)(i) sexual ; 1

1(a)(ii) pollen + stigma ;

pollen tube ;

style ;

ovary / ovule ;

female gamete / ovum ;

fertilisation or described ;

growth of pericarp / ovary wall ;

petals fall off / stamens or stigma or style withers AW ;

5 Ig self- or cross-pollination

1(b) asexual / vegetative ; 1

1(c) (using flowers) maximum 2 marks from

variation AW ;

population more likely to survive environmental change / disease ;

more widely dispersed ;

reduction of competition ;

(using plantlets) maximum 2 marks from

quick / only one plant needed / no other organism needed ;

supply of water / nutrition from parent plant ;

higher survival rate ;

new plants in environment to which plant is well suited AW

O/N18/21/Q2

2(a)(i) radicle / root ;

root hairs ;

plumule / shoot / stem ;

leaves ;

hypocotyl ;

2(a)(ii) (name of process)

germination / growth ; (use of enzymes) maximum 3 marks from

digest / breakdown / hydrolysis ; amylase ;

starch + to maltose / glucose ;

protease ;

protein

+ to amino acids ;

lipase ;

fats + to fatty acids and glycerol ;

4

2(b) development AW slower / would not germinate / would not grow ;

denature ; reactions / digestion / hydrolysis / breakdown + slow / don't occur ;

O/N18/22/Q3

3(a)(i) 3 ; 1 R 3%

3(a)(ii) some may not germinate / some may not produce a pollen tube ;

accuracy / precision / reliability / validity / reduce error ;

3(a)(iii) 8 ;

highest AW + % / number ;

highest AW

+ length OR longest ;

3(a)(iv) water

+ concentration / potential ;

less / no

+ water enters OR water leaves ;

osmosis / diffusion ;

3(b) stigma ;

style ovary / ovule / ovum / embryo sac / female gamete ;

movement of AW + male gamete / male nucleus / pollen nucleus ; fertilisation / fusion of gametes ;

M/J18/21/Q3

3(a) reference to structures on top of fruit **;**

increases surface area **;**
delays descent **/** wind catches beneath structures / floats **AW ;**

3(b)(i) time taken increases **+** distance travelled increases **OR** proportional **;**
3(b)(ii) 6 **; 1**
3(b)(iii) (fruits / seeds) will travel further **;**
away from plant **;**
away from other fruit / seeds / scattered **;**
colonise other areas **;**
reduced competition / prevent overcrowding **;**
competition for light / water / nutrients **;**
increased chance of **+** new plant / reproduction / germination **AW ;**
3(c) *environmental condition* temperature / water / oxygen **;**
explanation **;**
 (temperature) reference to enzyme activity
 (water) reference to solution / softening / rupture of testa / enzyme activity / transport
 (oxygen) reference to respiration

M/J18/22/Q1

1(a)
letter name of structure function
(A) sepal / calyx **;** protect **;**
(B) petal / corolla **;** attract / landing platform **;**
(C) stamen / anther **; or**
filament **;**
produces / contains **AW +**

pollen / male gamete / male nucleus **;**
support anther **;**
(D) ovary / carpel / pistil **;** produces / contains **AW +**
ovum / ovule / egg / female gamete **;**
or
forms **AW** fruit / site of fertilisation **;**
1(b)(i) **1** one or more vascular bundles **+** each oval shaped **+** location correct **;**
'xylem' labelled on inside **+** 'phloem' labelled separately on outside of at least one oval vascular bundle **;**
1(b)(ii) **1** transports / carries **AW +** water / ions / minerals **;**
support **;**

O/N17/21/Q5

5 (*fruit A*)
hooks / spikes **AW ;**
on animal / fur **;**
falls off / rubbed off / leaves animal **AW ;**
(*fruit B*)
edible / eaten / food **;**
colour / taste / juicy / sweet **;**
thrown away / discarded / faeces / egested **AW ;**
(*for A or B*)
new location / away from parent plant **;**

M/J17/21/Q5

5 *(sexual only)*
H ;
I ;
J ;
3 R letters in more than one box
Ig letters in incorrect box
(asexual only)
(**E**)
G ;
K ;
2
(both)
F ;

Reproduction in plants P2 questions 5090

M/J17/22/Q3

(a) line ending either on or in sepal **+** labelled either '**S**' or 'sepal' **;**
line ending either on or in carpel **+** labelled either '**C**' or 'carpel' **;**
3(b) (flower **D**)
anther(s) / stamen(s) **;**
pollen **+** mature / produced / present / released / collected **;**
stigma **+** closed / immature **AW** / does not receive pollen **;**
(flower **E**)
stigma **+** open / mature / receives pollen **;**
anthers **+** withered **AW OR** reference to no pollen produced / present / released / to be collected **;**
3
3(c) large **+** petal(s) **;**
reference to insect / bee landing **AW** on petal **;**
colour(ful) **+** petal(s) **;**
reference to scent / smell **;**
reference to nectar(ies) / (nectar) guides **;**
pollen **+** stick(y) / hooked (to attach to insect / bee) **;**
insect / bee makes contact **AW** with anther / stigma **+** while collecting nectar **;**

M/J17/22/Q7

7(a) (seed)
1 seed **+** results from fertilisation **AW** / sexual reproduction **;**
2 (fusion / fertilisation of) gametes **OR** pollen nucleus **+** egg /ovum / ovule **;**
3 reference to (gametes often) from different plants / flowers **;**
4 (gametes produced by) meiosis / reduction division **;**
5 combination **AW** of (different) genes / alleles **;**
(fruit)
6 fruit (wall) **+** results from mitosis **;**
7 reference to (genetically) identical / clones **;**
4 A maximum of **three** of marking points **1** to **5**
(i.e. for 'seed')
7(b) (wind) (animal)
1 small **OR** large **;**
2 light / buoyant **OR** heavy **;**
3 wings / parachutes **OR** hooks / hairs **;**
4 large surface area **OR** attachment (to animal) **;**
5 large number **OR** small number **;**
6 not coloured / dull **OR** colour / named colour / bright **;**
7 not sweet/juicy/flesh(y)/scented **OR** sweet / juicy / flesh(y) / scented **;**
8 reference to food / eaten / digested **;**
9 seed **+** enzyme resistant / cannot be digested / is egested / is lost in faeces / is thrown away **;**

O/N16/21/Q2

2(a)(i) **A** small **+ B** large / **A** smaller / **B** larger **;**
A smooth **+ B** spikes **AW ;**

A wind dispersal / **B** animal dispersal **;**
A light / **B** heavy **;**
2(a)(ii) transfer / movement **+** of pollen **;**
from anther **;**
to stigma **;**
of another plant (of same species) **;**
A stamen / pollen sac
R another species

2(a)(iii) (plant species **A**) wind **;**
reference to light / small / carried (by wind) **;**
(plant species **B**) insect **;**
reference to attachment (to insect) / carried (by insect)
moving between flowers **;**
2(b) large (petals) **;**
(brightly) coloured / patterned (petals) **;**
anthers enclosed in flower / not hanging out / erect **;**
scent **;**
nectar **;**

M/J16/21/Q2

2 (a) radicle / root ;
testa / seed coat ;
[2]
(b) stage A:
decreases ;
stage B:
decreases ;
explanation for A / B:
food store used ;
reference to respiration ;
reference to enzyme / named
enzyme action ;
stage C:
increases ;
explanation for C:
reference to photosynthesis ;
reference to production of
named food compound ;
reference to more cells
made / tissue growth ;
maximum 3 marks for A / B and
maximum 3 marks for C
[max 6]
(c) oxygen ;
reference to respiration ;
energy + for growth ;
suitable / correct temperature ;
reference to enzyme ;
breaks down food store AW ;

M/J16/22/Q1

1 (a) (i) sepals / calyx ;

petals / corolla ;
nectaries ;
[max 2]
(ii) type of pollination: self / wind ;
reason for wind: exposed / large +
stamens / anthers ;
reason for self: position of anthers
relative to stigma / carpel ;
reason for either : no petals / nectaries
to attract insects ;
[1]
[max 1]
(b) (i) seed / cotyledon ; [1]
(ii) bird / animal / herbivore ;
sweet / sugary / coloured
(skin) / juicy / succulent / taste / smell ;
eaten / consumed / food ;
spits out or drops / undigested / passes
out with faeces ;
at a distance from parent
plant / elsewhere AW ;
R reference to excretion
[max 3]
(ii) sugar (or named) / correct formula ;
fermenter/ fermentation / anaerobic
respiration (or description of) ;
reference to suitable
temperature / warmth ;
reference to enzymes ;
(c) (i) yeast / fungus ;

O/N15/22/Q1

1 (a) (i) pollination ; [1] I insect / wind / cross / self
(ii) stigma ; [1]
(b) line (continuing) down style ;
entering micropyle ;
touching / entering embryo sac ;
[3]
(c) (i) stigma / style / ovary wall ; [1]
(ii) ovary / ovule / embryo sac / ovum / ova / egg (cell) / gamete ; [1]
(d) from a different species / type / kind of plant ;
ref. chemicals on stigma unsuitable ;
couldn't germinate / not viable / infertile AW ;
not there long enough / grain immature / wrong enzymes ;

O/N15/22/Q9

9 (a)
both cell division ;
(mitosis)
in body cells or named ;
for growth / repair / replacement ;
chromosome number retained AW ;
ref. asexual reproduction / single parent ;

produces copy / identical / similar ;
produces two cells ;
(meiosis)
in ovaries* / ovule ;
testes* / anthers ;
ref. gamete / sex cell production ;
chromosome number halved / cells become haploid ;
sexual reproduction ;
genetically different ;
produces four cells ;
[max 7]
max 4 marks for mitosis or meiosis
A in zygote
I growth / repair within a cell
* OR A gonads for one mark
I fertilisation
(b) name of correct organism / crop / technique ;
always an exact / similar copy ;
known characteristics / flavour AW ;
more certain outcome / can be conducted in controlled conditions;
not reliant on pollination (agent) ;
only one parent needed ;
quick(er) ;
less expensive / greater profit / higher yield / more offspring ; A cutting, micro-propagation, tubers, bulbs, layering, runners

M/J15/21/Q8

8 (a) example named ;
large surface area ;
related adaptation, e.g. wing, air
bladder, etc. ;
allows plant to colonise new areas ;
reduces competition ;

(b) water ;
softening testa / seed coat ;
activation of enzymes ;
solvent ;
oxygen ;
ref. respiration* ;
energy (for germination / growth)* ;
suitable temperature ;
ref. enzyme / named enzyme action ;
break down food store ;
ref. respiration* ;
energy (for germination / growth)* ;

M/J15/22/Q6

6 (a) 1. name of fruit or seed ;
2. adaptation that brings animal and
plant into contact ;
3. how fruit or seed as carried away ;
4. how fruit or seed is discarded by

animal ;
5. ref to distance from parent
plant / another location ;
1. must fit the description if one is
given
2. e.g. taste, colour, hooks, etc.
3. e.g. internally, in intestine,
eaten, attached to fur
4. e.g. defaecation, scratched off /
falls off / spat out
[max 4]
(b) (i) 1. seeds not viable / dormant / AW ;
2. temperature not suitable ;
3. (amount of) water ;
4. some of the seeds may require
light ;
5. pH ;
[max 2]
(ii) 1. ref. to competition ;
2. accept two from (for) light /
nutrients / water ;;
4. ref. unsuitable temperature / pH ;
5. diseases ;
6. eaten (by herbivores / insects /
pests) / damage by animals ;
7. toxins in soil ; 1. A overcrowding 2. Ig refs to too much Ig CO_2 and O_2

O/N14/21/Q8

8 (a) (i) in testes / anthers / ovaries ;
cell division ;
halving of chromosome numbers / haploid ;
so that diploid number is restored on fertilisation ;
[max. 2]
(ii) one (either) colour is controlled by a dominant allele;
one by a recessive allele ;
one parent heterozygous – (or described, e.g. Rr) ;
one is homozygous recessive (or described) ;
correct ref. to gametes ;
gametes correctly identified for both parents ;
how gametes pair to produce offspring in 1:1 ratio ;
[max. 6]
(all points acceptable on an
annotated genetic diagram)
(b) mutation ;
ref to a named mutagen ;
possible co-dominance ;
ref. to heterozygous plants having pink flowers ;
ref. availability of certain ions (as in Hydrangea) ;

O/N14/22/Q6

(a) ovule:
in ovary ;
contains female gamete ;

ref. to haploid ;
seed:
ovule after fertilisation ;
ref. diploid (or with ref. fruit) ;
(grows) larger than ovule ;
stores food / ref. cotyledons ;
contains (rest of) embryo / radicle + plumule ;
(surrounded by) testa ;
ref. dispersal ;
fruit:
seed(s) + ovary (wall) / pericarp ;
ref. dispersal ;

(b) dry ;
light ;
(may be) winged / hairy / feathery / helicopter / parachute ;
large surface area ;
to allow wind to detach it from parent plant ;
to delay its descent ;
(allow it to be carried) long distance AW / away from parent plant ;

M/J14/21/Q6

7 (a) Mitosis Meiosis
2 daughter cells 4 daughter cells
haploid diploid
chromosome number
maintained
chromosome number
halved
occurs in all organs / body
cells
occurs in gamete producing
organs / named
produces body cells / used in
growth
produces gametes / named
ref. asexual reproduction ref. sexual reproduction
no genetic variation in
offspring AW
genetic variation in offspring
AW
[4]
All points must be comparative to gain credit.
(b) Father ;
Max 5 from the following:
father is XY / contains Y chromosomes ;
mother is XX / does not contain Y chromosomes ;
father produces sperm with either X or Y (chromosomes) ;
mother produces eggs only with X (chromosomes) ;
sex depends on which sperm fertilises the egg ;
1:1 male : female in offspring / AW ;

Reproduction in plants P2 questions 5090

M/J14/22/Q3

3 (a) self (–pollination) ; [1]
(b) (i)
(carried by) wind ;
pollen to stigma ;
of another (wheat) plant / flower ;
correct ref. to cross-pollination (now being possible) ;
[3] Ig ref. to animals
(ii) wind can't carry / can't be carried far / reduced dispersal ;
too much dependence on self-pollination / lack of (genetic) variation AW ;
wind may not be blowing (over short time period) ;
reduces chances of pollination / fertilisation ;

(c) (i) genetic engineering / genetic modification ;
[1] Ig gene transfer / biotechnology
(ii) (bacteria) fix / convert / change / turn ;
atmospheric / soil nitrogen ;
(to) ammonium ;
(to) nitrates ;
(to make) amino acids / proteins ;
(nitrates) absorbed / (amino acids or proteins) used by plants

O/N13/21/Q8

8 (a) cell division;
ref. to chromosomes;
diploid to haploid;
gamete formation/ named gametes;
all gametes genetically different;
fertilisation restores chromosome number / AW;
leads to variation in population;
[max 4]
A halving of chromosome number
(b) name of fruit / seed (not linked to following marks);
structural feature of fruit/seed that is a wind-dispersal adaptation;
ref. large surface area / buoyancy;
*wind removes fruit / seed from parent plant;
*seed relatively light in mass;
*to delay descent of seed AW;
spread over large area / prevent overcrowding / competition ;
[max 6]
Accept * points for descriptions of pollen for max 3
e.g. floats for long time / increases air resistance

O/N13/22/Q8(a)

8 (a) contains female gamete / female nucleus / egg cell;
in ovary;

fertilized / fuse;
(by the) male gamete / male nucleus;
(to form) zygote / embryo;
surrounded by integuments/testa;
seed + germinates (to form new plant);

M/J13/21/Q3

3 (a) (i) (species P)
self / insect / wind ;
(pollen) from anther to stigma*;
of same flower;
(species Q)
Cross;
(by) insect (pollination);
(pollen) from anther to stigma*;
of different plant;
[max 4]
* accept once only in either P or Q
Accept plausibly named insect eg
bee, wasp
(ii) brightly coloured petals;
large petals;
scent;
nectar;
sticky pollen or stigma;
[max 2]
(b) Cross pollination / has 2 parents / ref genes / alleles; [1] Accept "exchange of traits"
(c) pollen tube;
grows / digests + down style;
to ovule / embryo sac / micropyle;
male + female gametes /egg / nuclei fuse;

M/J13/22/Q6

(a) 1. addition / availability of carbon dioxide;
2. controlled / optimum AW temperature (or any reasonable stated temperature);
3. ref. light (intensity);
4. ref. blinds during day / artificial lights (at night time);
5. keep well supplied with water / ref. irrigation / humidity control;
6. addition of fertiliser / any named ion / pH control / hydroponic techniques ;
7. nitrate + protein manufacture / magnesium + chlorophyll production;
8. photosynthesis (A anywhere relevant);
9. growth;
10. maximum rate / day and night / 24 hrs per day ;
11. pest control;
12. protection from (adverse) climatic factors or any named AW; Max 7
Ignore refs. to O_2
A any named ion + function
R chloroplasts

Must be ref. P/S or growth
(b) isolation from other varieties of the species;
limited genetic variation;
can pollinate only with plants in the building / cannot cross pollinate with plants outside;
exclusion from agents of pollination / wind / insects;
seeds less viable;