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.

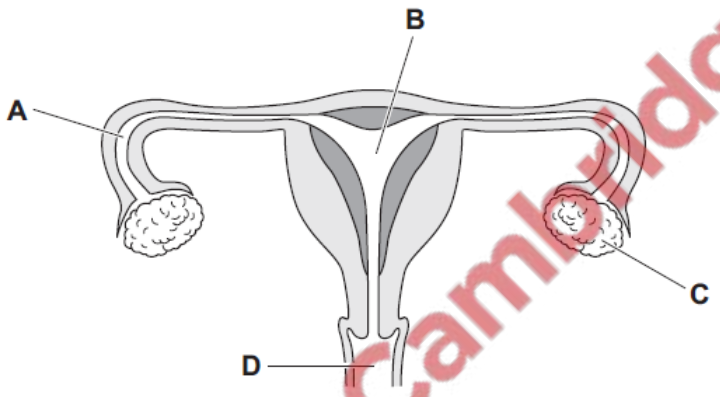
C Asexual reproduction produces genetically different offspring from one parent.

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

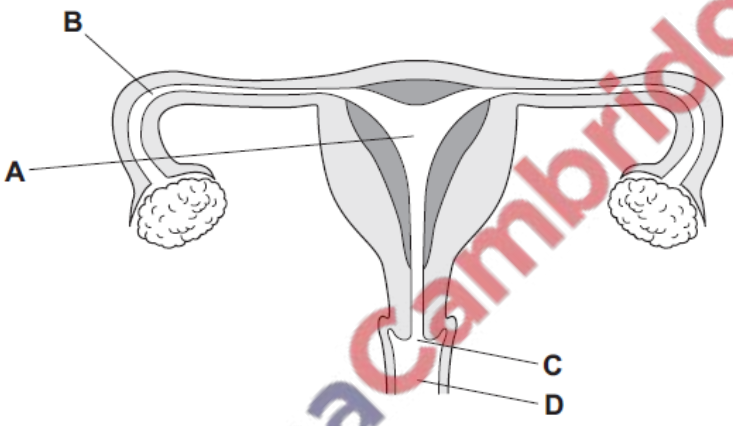
C implantation of embryo

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?



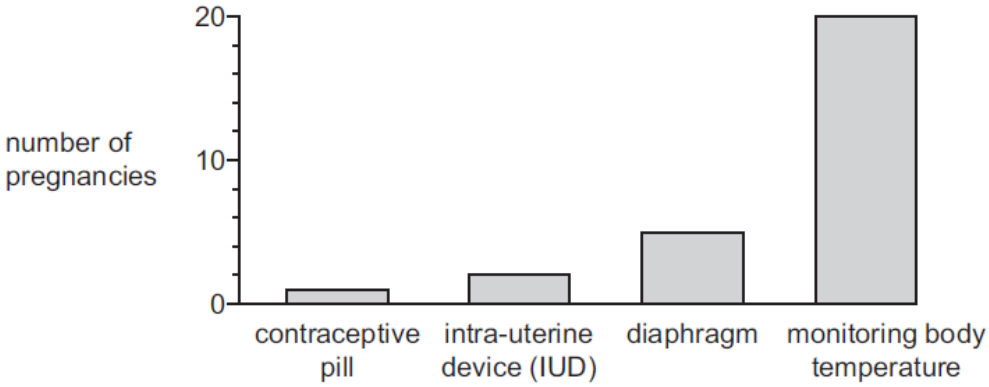
9. June/2020/Paper_12/No.28

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

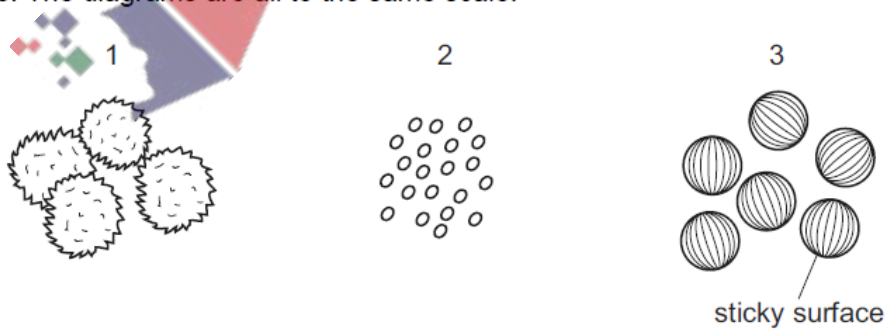
B lung

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.



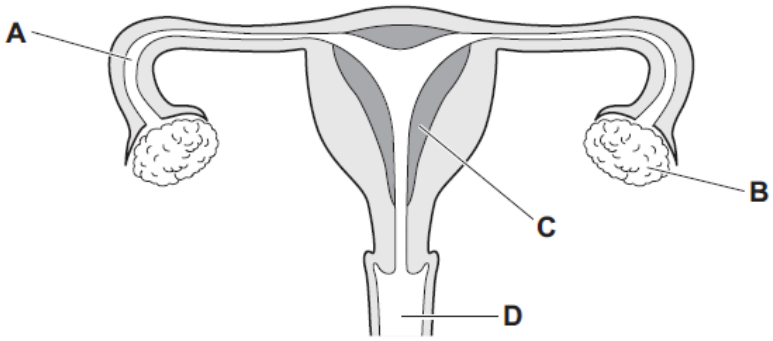
Which pollen grains are most likely to be carried by the wind?

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.

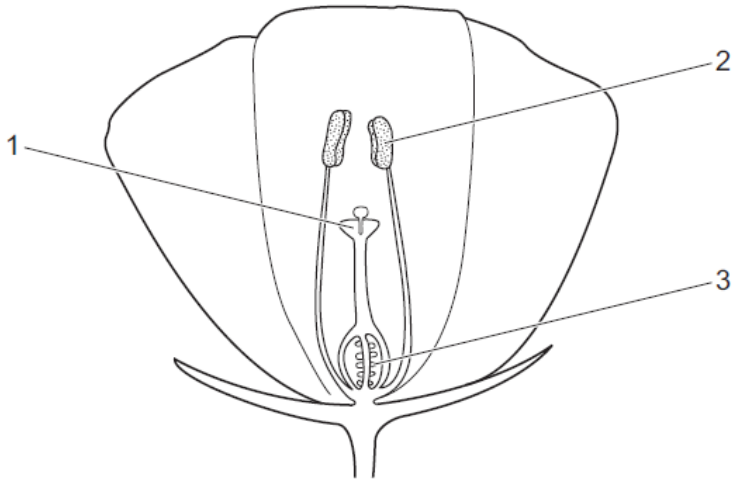
B Donated sperm cells are used to fertilise the egg cells.

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

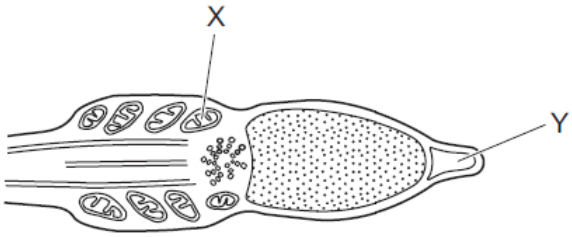
18. June/2020/Paper_23/No.27

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.

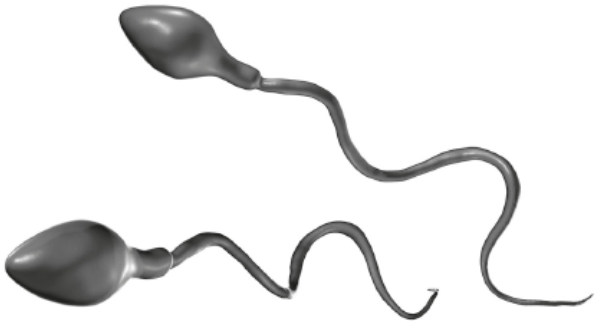


Fig. 2.1

(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.

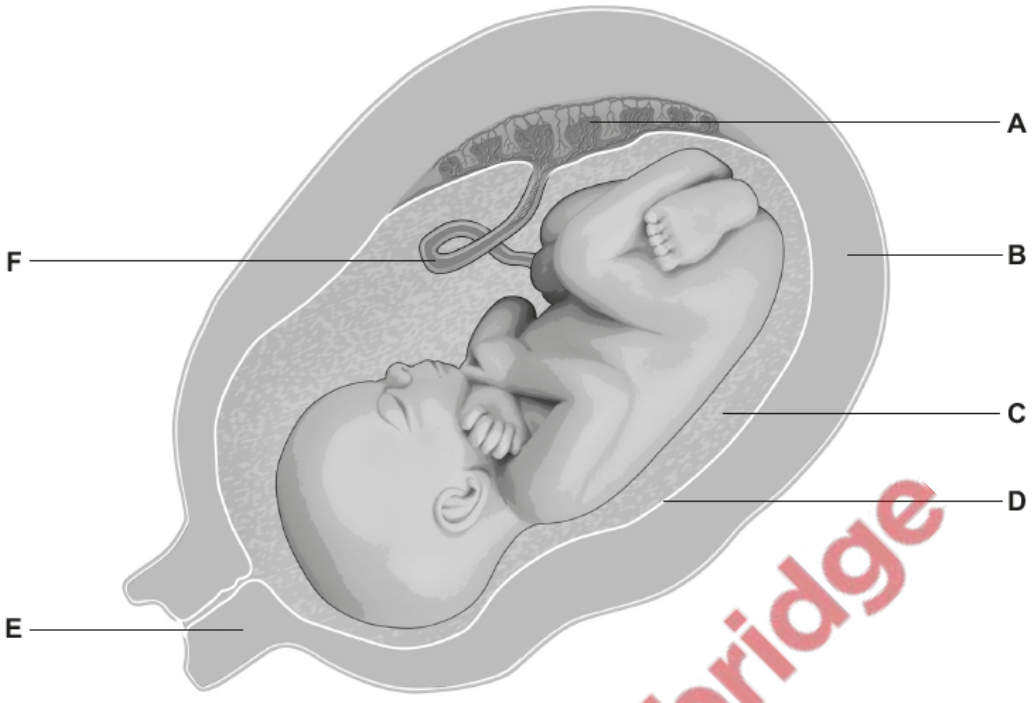


Fig. 2.2

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.

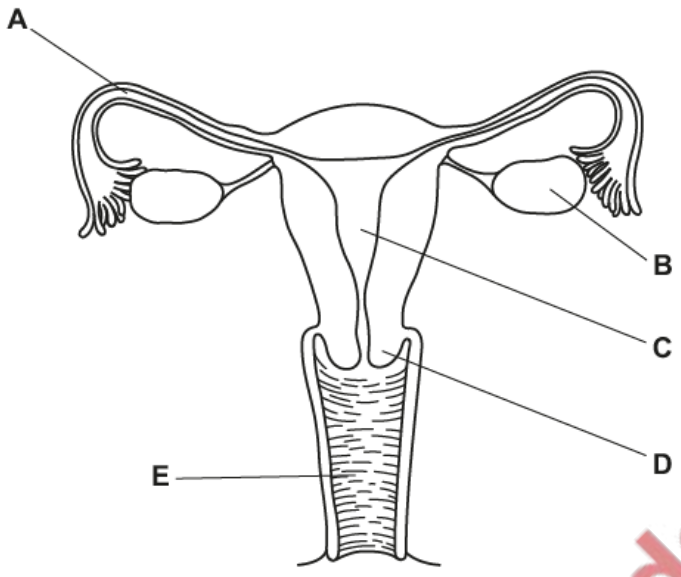


Fig. 2.1

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.

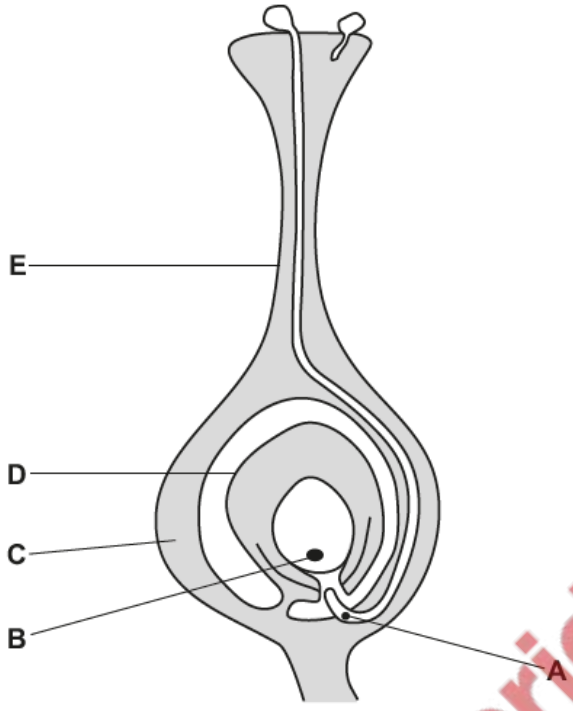


Fig. 4.2

(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.

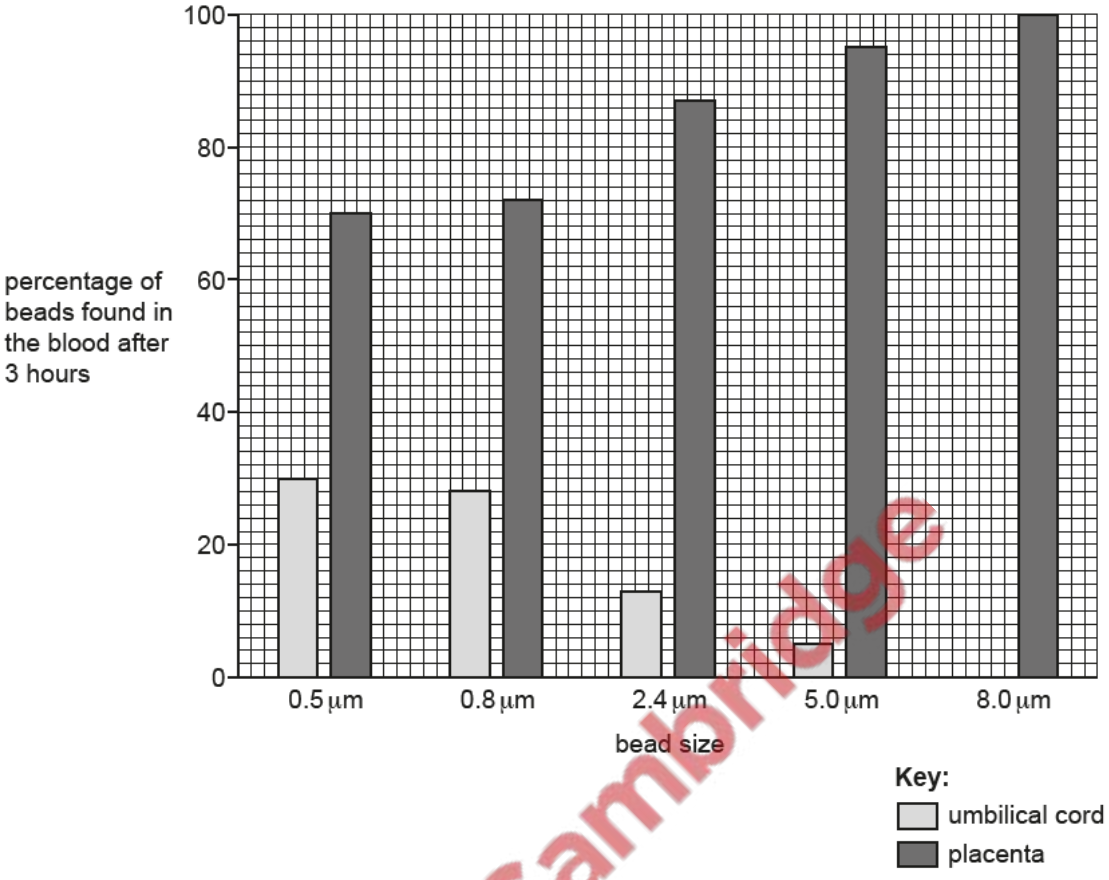


Fig. 2.1

(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.

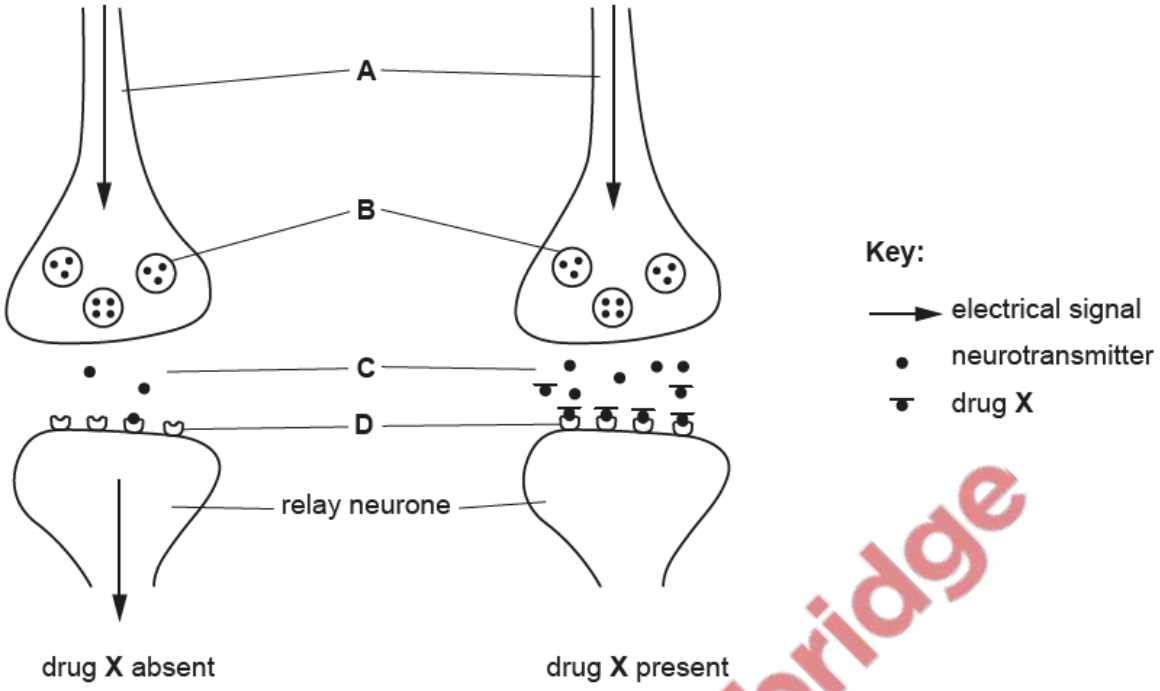


Fig. 2.2

(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.

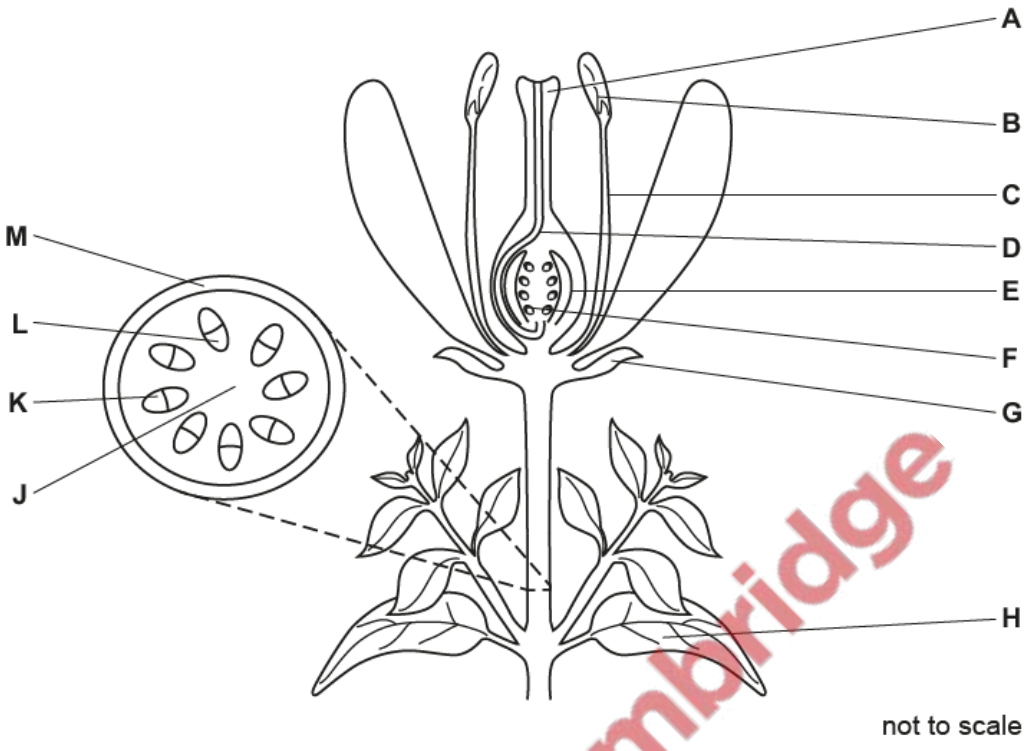


Fig. 6.1

(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]