1.1 a What is a reflex? (2 marks)

.....

.....

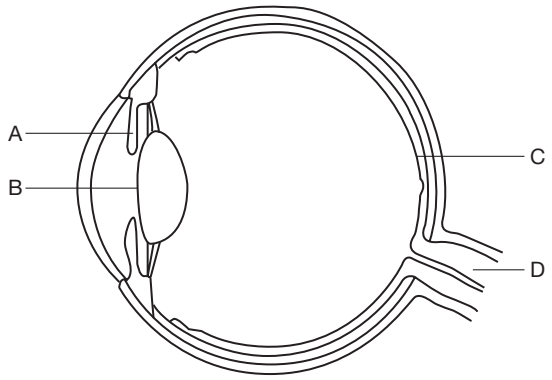
b Which is the correct neurone pathway in a reflex? Tick one box. (1 mark)

Sensory neurone → motor neurone → relay neurone	
Sensory neurone → relay neurone → motor neurone	
Motor neurone → sensory neurone → relay neurone	

c Give an example of a reflex. (1 mark)

.....

1.2 The image below shows a diagram of an eye.



a Label the parts of the eye, A–D. (4 marks)

A .....

B .....

C .....

D .....

b What reflex happens in A when a bright light is shone into an eye? (2 marks)

.....

.....

c **What is the function of B?** (1 mark)

.....

d **Draw a line onto the image of the eye to show the path of light through the eye.** (1 mark)

e **Where does the light focus in the eye in a person with long-sightedness? Tick one box.** (1 mark)

Before the retina	
On the retina	
Behind the retina	

f **What type of lens is used to correct long-sightedness?** (1 mark)

.....

1.3 **a** **What is the endocrine system?** (2 marks)

.....

.....

b **Where in the body is oestrogen produced? Tick one box.** (1 mark)

Pituitary gland	
Ovaries	
Testes	

c **What is the role of oestrogen in the menstrual cycle?** (2 marks)

.....

.....

d **Contraceptives are used to prevent pregnancy. Which of the contraceptive methods below uses hormones? Tick one box.** (1 mark)

Intrauterine implant	
Condoms	
Diaphragm	

1.4 Several types of contraceptive were studied to see which was the best at preventing pregnancy. The results are shown in the table below.

Type of contraception	Number of pregnancies per 1000	Percentage of pregnancies prevented (%)
Condoms	30	97
Spermicides	40	
Contraceptive pill	1	
Intrauterine device	2	

a Calculate the percentage of pregnancies prevented for each type of contraception and complete the table. (3 marks)

b Which method of contraception is the most effective at preventing pregnancy? (1 mark)

.....

H **c Name one hormone that is used to treat infertility.** (1 mark)

.....

H **d Describe what happens during in vitro fertilisation (IVF).** (3 marks)

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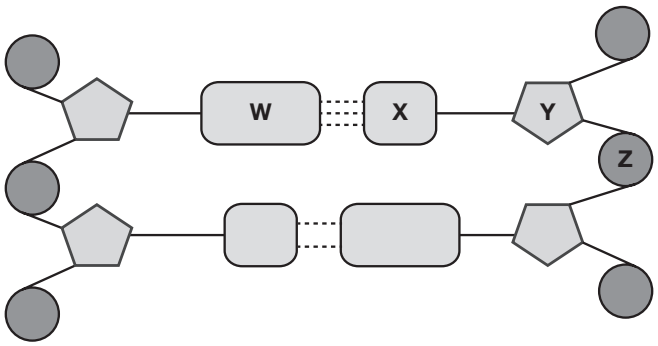
H **e Give one advantage and one disadvantage of IVF.** (2 marks)

Advantage .....

Disadvantage .....

2.1 The image below shows a DNA molecule.



a Identify the parts of the DNA molecule labelled Y and Z. (2 marks)

Y .....

Z .....

b **W and X are DNA bases joined in a base pair by three hydrogen bonds. The base pair underneath, joined by two hydrogen bonds, are A (adenine) and T (thymine).**

What are W and X? (2 marks)

.....

.....

c **Where in the cell is the DNA found?** (1 mark)

.....

d **DNA is the material that makes genes. What is a gene?** (2 marks)

.....

.....

2.2 **The height of bean plants is controlled by a single gene. The allele for tall bean plants, T, is dominant to the allele for short bean plants, t.**

a **What is meant by the terms recessive and dominant?** (2 marks)

Recessive .....

Dominant .....

b **The Punnett square below shows the inheritance of alleles from two tall bean plants with the alleles, Tt.**

	T	**t**
T	Tt	Tt
t	Tt	tt

i **How many offspring will be tall?** (1 mark) .....

ii **How many offspring will be short?** (1 mark) .....

iii **What percentage of the offspring have the alleles, tt?** (1 mark) .....

c **The offspring with the alleles, tt, breeds with another plant with the alleles, TT.**

i **What are the possible combinations of alleles?** (1 mark) .....

ii **What are the chances that the offspring will be tall?** (1 mark) .....

2.3 **a** **Name the two scientists that proposed the theory of evolution.** (2 marks)

.....

.....

b Use the words in the box below to explain the process of natural selection. (3 marks)

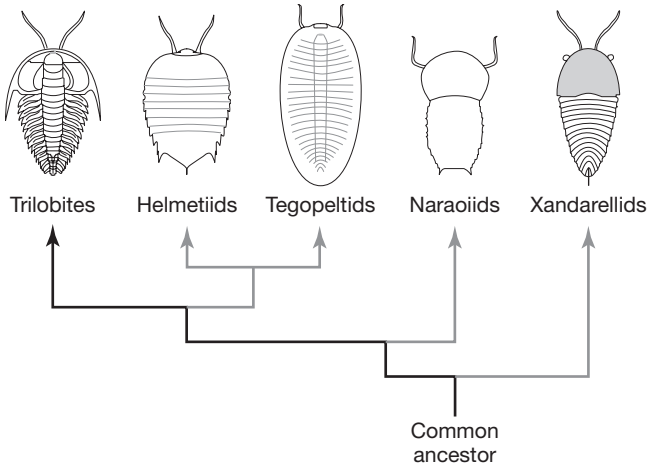
variation	adapted	offspring

.....

.....

.....

c Fossils are evidence of evolution. The evolution tree below shows the fossils of arachnomorpha, a group of organisms that lived millions of years ago.



i What evidence from the image shows that arachnomorpha had a common ancestor? (2 marks)

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ii Which two species are the most closely related? (2 marks)

.....

.....

2.4 a All species are classified into groups. Complete the table below to show the classification of the common toad, *Bufo bufo*. (4 marks)

	Phylum	Class		Family	Genus	Species
Animal	Vertebrate		Anura	Bufonidae		bufo

b Name another species in the same class as the common toad. (1 mark)

.....

c Explain why the common toad has two names. (2 marks)

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3.1 a A gardener puts compost from the garden into the soil where carrots are growing. What is the purpose of the compost? (2 marks)

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b Name two minerals that plants need for healthy growth. (2 marks)

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c Dead leaves from a nearby tree fall onto the soil. The carbon from the leaves is recycled through the carbon cycle. Explain how the carbon from the dead leaves is used for the growth of the carrots. (6 marks)

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d The gardener picks the carrots and stores some of them in the freezer, some in an airtight box, and some in an open box in a cupboard. Some of the carrots begin to decay. The number of carrots that decayed in each condition are shown in the table below.

Condition	Number of carrots decaying
Freezer	0
Airtight box	2
Box in cupboard	12

i Explain why none of the carrots in the freezer decayed. (2 marks)

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ii Suggest two reasons why the carrots in the open box decayed. (2 marks)

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3.2 In a woodland community, caterpillars (10 kg) feed on an oak tree (100 kg). The caterpillars are eaten by blackbirds (2kg), which are eaten by a sparrowhawk (1kg).

a Define the term community. (1 mark)

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b Draw a food chain to show the feeding behaviour of this community. (2 marks)

c Which of these organisms are primary consumers? (1 mark)

.....

d Which of these organisms is a producer? (1 mark)

.....

e Draw a pyramid of biomass of the food chain. (2 marks)

3.3 Some students decided to investigate the abundance of woodlice in two different woodland habitats of the same size. The first habitat was dark and damp. The second habitat was light and dry. The students used the 'capture, mark, recapture' method.

a How much time should the students allow before recapturing the woodlice? Justify your answer. (4 marks)

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b The students caught 80 woodlice in the dark, damp habitat and 10 woodlice in the light, dry habitat. They marked the woodlice and let them go. The students caught some woodlice on another occasion and counted how many of them were marked. The results are shown in the table below.

Habitat	Number of woodlice caught the first time	Number of woodlice caught the second time	Number of woodlice caught the second time that are marked
Dark and damp	80	88	40
Light and dry	10	7	2

i Estimate the number of woodlice in each habitat. (4 marks)

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Number of woodlice in dark, damp habitat .....

Number of woodlice in light, dry habitat .....

ii Suggest why there were these number of woodlice in each area. (1 mark)

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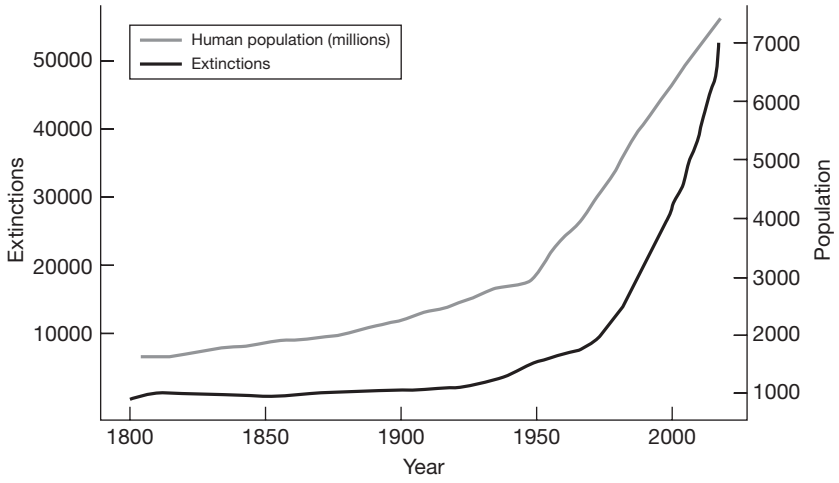
3.4 The graph below shows the number of people on Earth (in millions) and the number of extinctions between 1800 and 2010.



a Describe the pattern of the graph. (2 marks)

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b The industrial revolution began in the 1800s. Suggest why extinctions began increasing at the same time. (5 marks)

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