

# AQA

GCSE

# Combined Science: Trilogy

# F

**SET A – Biology: Paper 2 Foundation Tier**

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## Materials

Time allowed: 1 hour 15 minutes

### For this paper you must have:

- a ruler
- a calculator.

## Instructions

- Answer **all** questions in the spaces provided.
- Do all rough work in this book. Cross through any work you do not want to be marked.

## Information

- There are 70 marks available on this paper.
- The marks for questions are shown in brackets.
- You are expected to use a calculator where appropriate.
- You are reminded of the need for good English and clear presentation in your answers.
- When answering questions 07.4 and 08.1 you need to make sure that your answer:
  - is clear, logical, sensibly structured
  - fully meets the requirements of the question
  - shows that each separate point or step supports the overall answer.

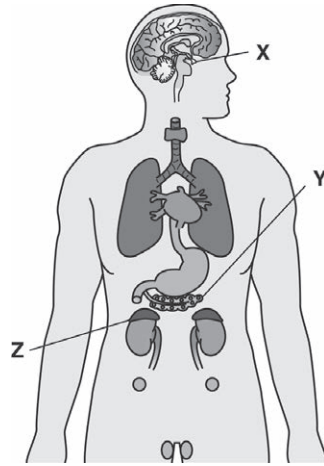
## Advice

- In all calculations, show clearly how you work out your answer.

Name: .....

01 Figure 1.1 shows some of the human hormone glands.

Figure 1.1



01.1 Write down the names of glands X, Y and Z.

Choose your answers from the list.

Adrenal

Pancreas

Pituitary

Testes

Thyroid

Gland X: .....

Gland Y: .....

Gland Z: .....

[3 marks]

01.2 How do hormones travel around the body?

.....

[1 mark]

**01.3** Draw **one** line from each hormone to the gland that secretes it.

<b>Hormone</b>	<b>Gland</b>
Insulin	Ovary
Oestrogen	Testis
Testosterone	Pancreas

[2 marks]

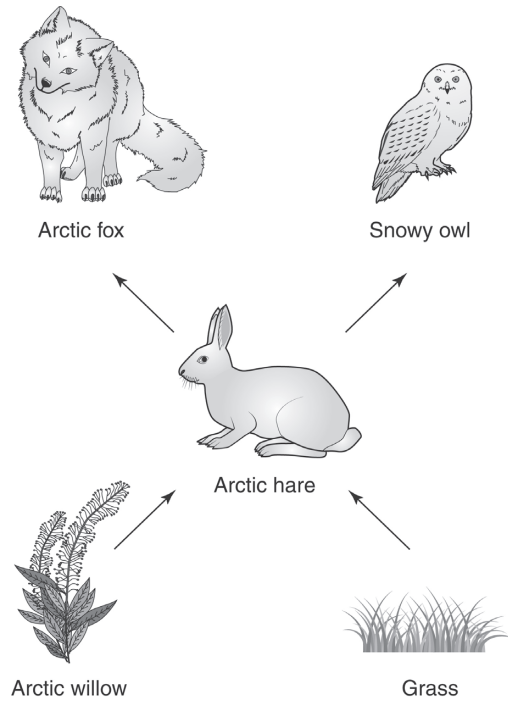
**01.4** What health condition is caused by a lack of insulin?

.....

[1 mark]

02 Figure 2.1 shows part of an Arctic food web.

Figure 2.1



02.1 Write down one producer from Figure 2.1.

.....

[1 mark]

02.2 Write down one secondary consumer from Figure 2.1.

.....

[1 mark]

**02.3** If the number of Arctic foxes decreased, what would start to happen to the number of snowy owls?

Give a reason for your answer.

Answer: .....

Reason: .....

.....

[2 marks]

**02.4** What term describes all the organisms in the Arctic food web?

Tick **one** box.

Community

Ecosystem

Environment

Habitat

[1 mark]

**02.5** Some organisms in the Arctic food web may compete for **biotic** factors.

Which factor can be described as biotic?

Tick **one** box.

Light

Mates

Mineral ions

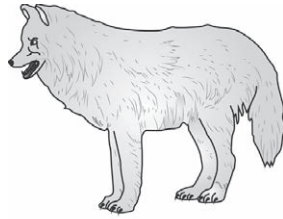
Water

[1 mark]

Question 2 continues on the next page

02.6 Figure 2.2 shows an Arctic fox.

Figure 2.2



Arctic foxes are predators.

Identify **one** adaptation that helps an Arctic fox survive as a predator.

Explain how the adaptation helps it survive.

Adaptation: .....

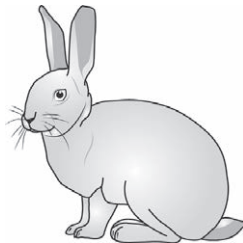
How it helps survival as a predator: .....

.....

[2 marks]

02.7 Figure 2.3 shows an Arctic hare.

Figure 2.3



Arctic hares are prey animals.

Identify **one** adaptation that helps an Arctic hare survive as a prey animal.

Explain how the adaptation helps it survive.

Adaptation: .....

How it helps survival as a prey animal: .....

.....

[2 marks]

**03** Hormones are involved in human reproduction.

**03.1** Draw **one** line from each hormone to its function.

Hormone	Function
FSH (Follicle stimulating hormone)	Causes eggs to mature
LH (Luteinising hormone)	Maintains uterus lining
Progesterone	Stimulates the release of eggs

[2 marks]

**03.2** Complete **Table 3.1** to show the number of chromosomes in the different types of human cell.

**Table 3.1**

Type of cell	Number of chromosomes in cell
Sperm	
Egg	
Fertilised egg	46
Embryo	

[2 marks]

Question 3 continues on the next page

**03.3** As an embryo grows, different types of cells develop.

What is this process called?

Tick **one** box.

Differentiation

Fusion

Meiosis

Reproduction

[1 mark]

**03.4** Draw **one** line from each contraceptive to how it works.

**Contraceptive**

Diaphragm

Intrauterine device (IUD)

Oral contraceptive

Spermicide

**How it works**

Kills sperm

Prevents eggs maturing

Prevents fertilised egg  
implanting

Prevents sperm reaching egg

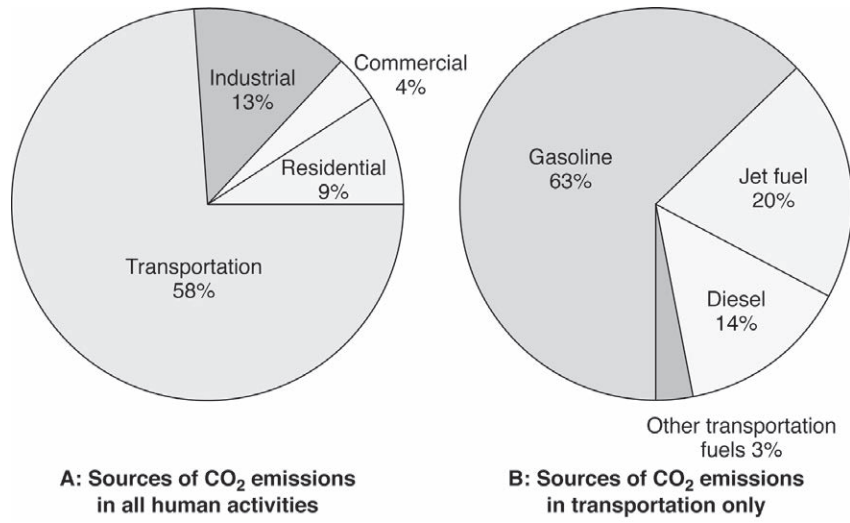
[3 marks]



04 Figure 4.1 shows carbon dioxide emissions in California.

Pie chart B shows the breakdown of the emissions from transportation.

Figure 4.1



04.1 Calculate the percentage of carbon dioxide emissions from electric power.

.....

.....

.....

Answer = ..... %

[2 marks]

04.2 Why does using electric power cause carbon dioxide emissions?

.....

.....

[2 marks]

Question 4 continues on the next page

**04.3** Which produces more carbon dioxide emissions, industrial activities or jet fuel?

Show your working out to justify your answer.

.....

.....

.....

.....

**[2 marks]**

**04.4** Why are many people concerned about carbon dioxide emissions?

.....

.....

**[1 mark]**

**04.5** Which process **removes** carbon dioxide from the atmosphere?

Tick **one** box.

- Combustion
- Deforestation
- Photosynthesis
- Respiration

**[1 mark]**

05 Variation is caused by the environment or genes.

Figure 5.1 shows some human features that show variation.

Figure 5.1



05.1 Identify **one** feature from **Figure 5.1** that is caused by the environment.

.....

[1 mark]

05.2 Use words from the box to complete the sentences.

chromosome	DNA	double helix
genome	polymer	protein
		strand

Genes are made of a chemical called ....., which forms a shape called a .....

Genes are small sections of a structure called a .....

[3 marks]

Question 5 continues on the next page

**05.3** Earwax can be either wet or dry.

Two alleles control this:

- wet (**A**)
- dry (**a**)

The wet allele is dominant to the dry allele.

**Figure 5.2** shows a genetic cross between two people, each with the genotype **Aa**.

Complete **Figure 5.2**.

**Figure 5.2**

	<b>A</b>	<b>a</b>
<b>A</b>		<b>Aa</b>
<b>a</b>		

[2 marks]

**05.4** What is the **phenotype** of someone with the genotype **Aa**?

.....

[1 mark]

**05.5** Which term describes someone with the genotype **Aa**?

Tick **one** box.

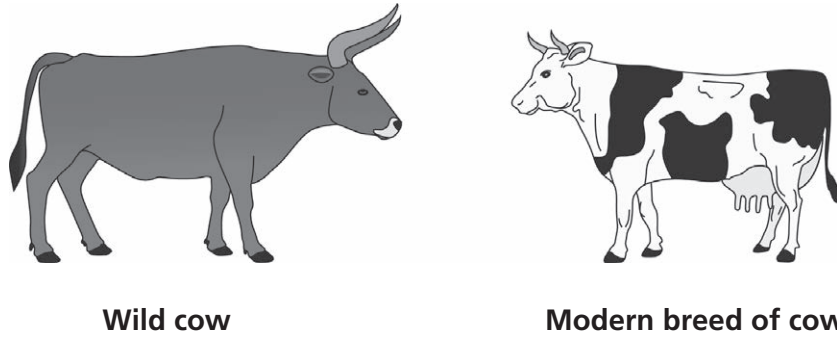
- Dominant
- Heterozygous
- Homozygous
- Recessive

[1 mark]

06 **Figure 6.1** shows a modern breed of cow and a wild cow.

Modern breeds of cow were produced by selective breeding starting with wild cows similar to that shown in **Figure 6.1**.

**Figure 6.1**



**06.1** The modern breed of cow has more meat than the wild cow.

Describe how selective breeding can produce a cow with more meat.

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**[5 marks]**

**Question 6 continues on the next page**

**06.2** Identify **one other** feature in **Figure 6.1** that has been selectively bred for.

Explain why the feature has been selectively bred for.

Feature: .....

Reason: .....

.....

**[2 marks]**

**06.3** Some plant crops have been selectively bred.

Other plant crops have been changed by introducing genes from other species.

What is this process called?

Tick **one** box.

Genetic cross

Genetic engineering

Genetic mutation

Genetic variation

**[1 mark]**

07 In a park, some grassland is left to grow wild except for a path which is mown regularly.

Students used a transect line to investigate how the path affected the distribution of four different plant species.

Figure 7.1 shows the line of the transect.

The students placed quadrats every metre along the transect.

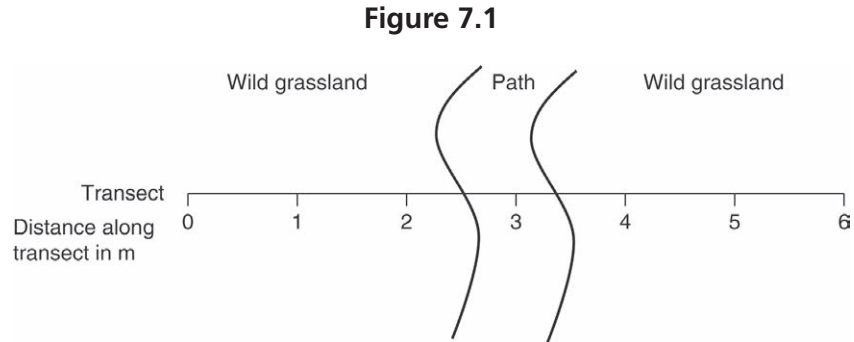


Table 7.1 shows their results.

**Table 7.1**

Distance along transect in m		0	1	2	3	4	5	6
Number of individual plants of each species per quadrat	Species A	5	4	3	0	4	6	5
	Species B	0	0	1	8	2	0	0
	Species C	4	3	2	0	3	4	4
	Species D	0	0	2	3	1	0	0

07.1 Look at Table 7.1.

What is the mode number per quadrat for species D?

Answer: .....

[1 mark]

Question 7 continues on the next page

07.2 Look at Table 7.1.

What is the median number per quadrat for species A?

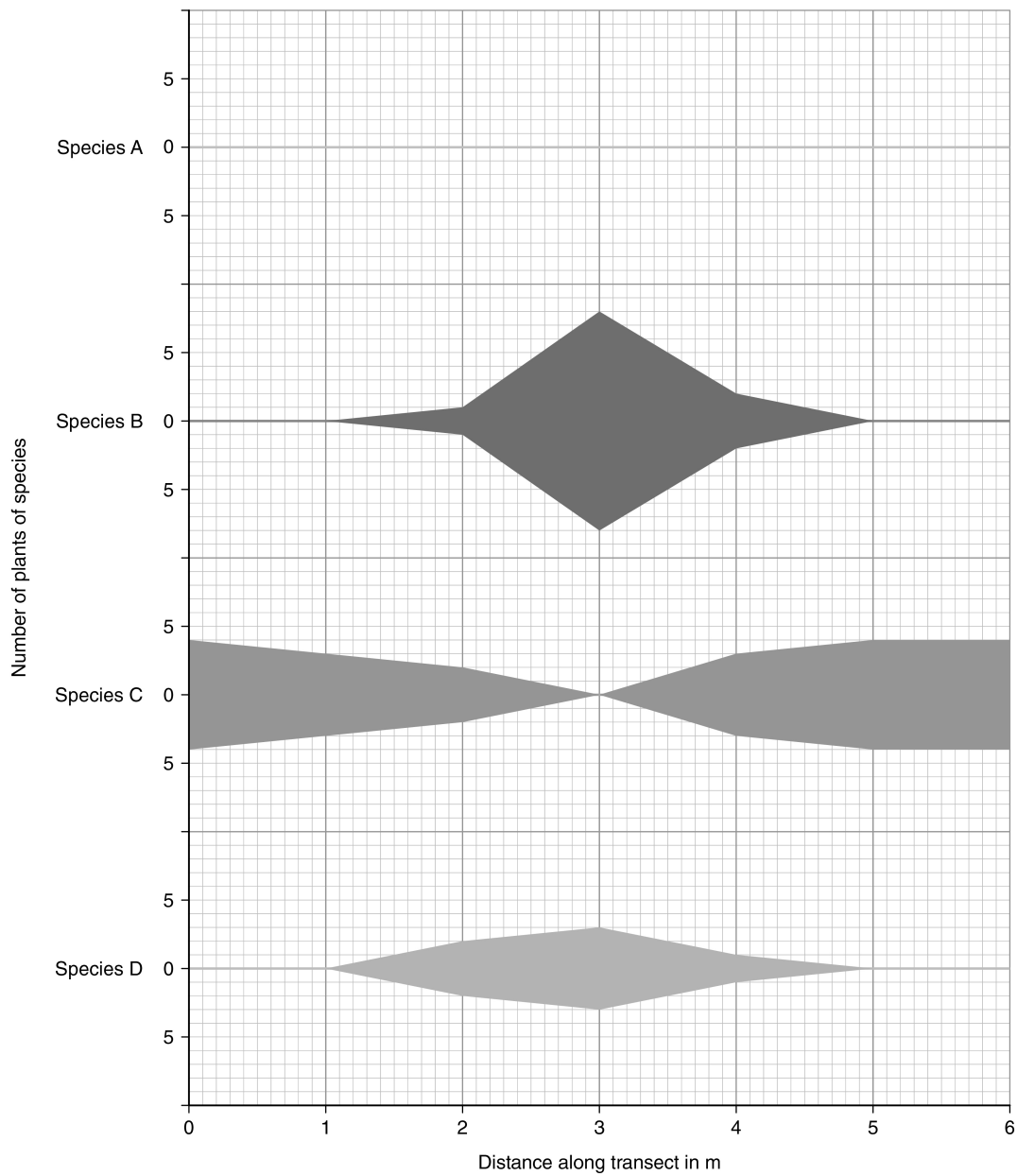
Answer: .....

[1 mark]

07.3 Figure 7.2 shows kite diagrams of the results.

Use the data for species A from Table 7.1 to complete Figure 7.2.

Figure 7.2

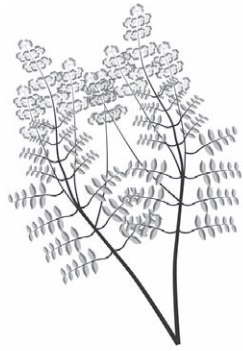


[4 marks]



07.4 Figure 7.3 shows pictures of each plant species.

Figure 7.3



Species A



Species C



Species B



Species D

Suggest reasons for the distributions of the four species along the transect.

Use information from **Table 7.1** and **Figures 7.1, 7.2** and **7.3** to help you answer.

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[4 marks]

Turn over >

**08** A group of students investigated their reaction times.

They each took it in turn to press a timer button as soon as they heard a buzzer.

Each student used their right hand.

Each student took the test three times and recorded their shortest reaction time.

There were eight girls and six boys in the group.

**Table 8.1** shows their results.

**Table 8.1**

	Shortest reaction times in s								Mean reaction time in s
Girls	0.21	0.16	0.18	0.19	0.18	0.16	0.20	0.19	0.18
Boys	0.19	0.15	0.32	0.16	0.17	0.20			0.20

**08.1** One of the students made this conclusion:

**Girls have shorter reaction times than boys.**

Evaluate the method used and the student's conclusion.

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**[6 marks]**

**08.2** **Figure 8.1** shows the nerve pathway involved in the investigation.

**Figure 8.1**

Sound of buzzer → Ear → Brain → Hand muscles → Press button

In **Figure 8.1**, which is the receptor and which is the effector?

Receptor: .....

Effector: .....

**[2 marks]**

**Question 8 continues on the next page**

**08.3** How does information pass along a nerve pathway?

.....  
.....

**[2 marks]**

**08.4** One of the students says:

**Pressing the button quickly is an example of a reflex action.**

Is the student correct?

Give a reason for your answer.

Is the student correct? .....

Reason: .....

.....

**[1 mark]**

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**END OF QUESTIONS**