

Hormonal coordination in humans – GCSE Combined Science Biology1. **No.4**

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In sexual reproduction, cells divide by meiosis to form gametes.

Which **two** statements are true for cell division by meiosis?**[2 marks]**Tick (✓) **two** boxes.

Daughter cells have two sets of chromosomes.

☐

Four daughter cells are formed.

☐

The daughter cells are genetically identical.

☐

The DNA replicates twice.

☐

The parent cell divides twice.

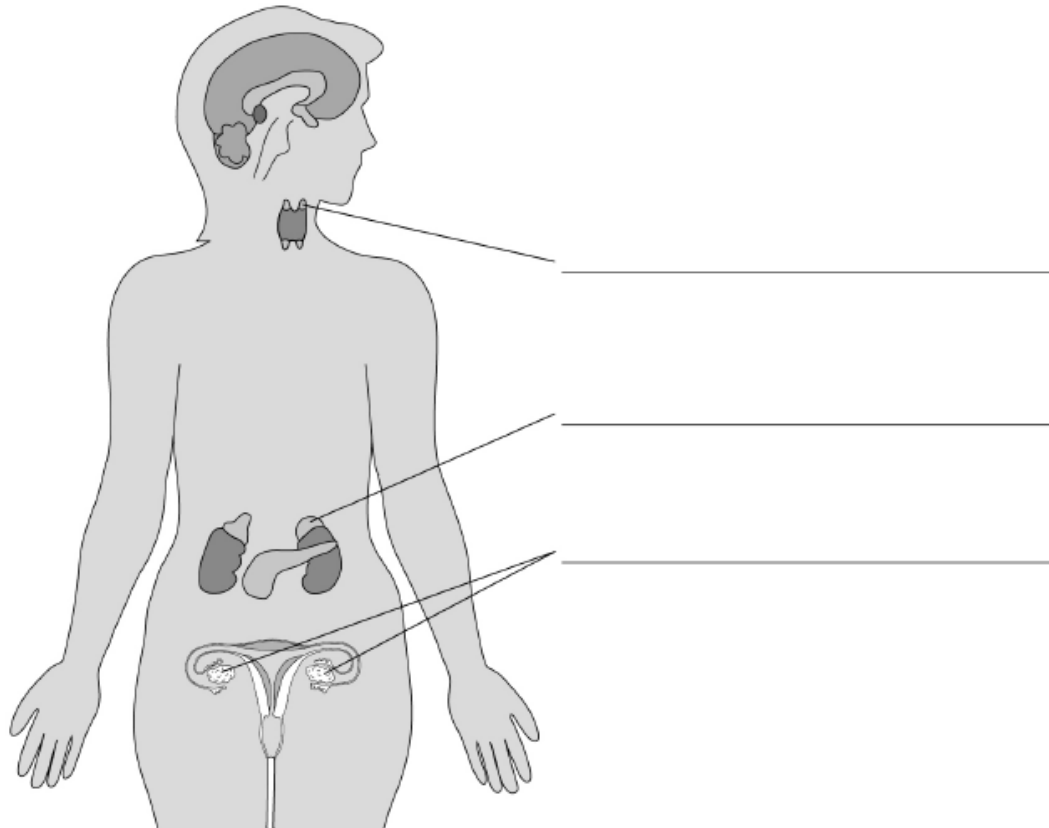
☐

Hormones are released from endocrine glands.

Each hormone travels in the bloodstream to a target organ.

Figure 3 shows the position of endocrine glands in a female.

Figure 3



0	4	.	2
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 Label the endocrine glands on **Figure 3**.

[3 marks]

0 4 . 3 Complete Table 2.

[3 marks]

Table 2

Hormone	Name of gland which releases hormone	Target organ of hormone
Luteinising hormone (LH)	Pituitary gland	
	Adrenal gland	
Glucagon		

Millions of geranium plants are sold each year in garden centres.

Geraniums can be reproduced asexually or sexually.

Figure 4 shows a potted geranium plant.

Figure 4



Garden centres usually grow new geranium plants by asexual reproduction.

0 4 . 4

Suggest **two** advantages for garden centres of growing geraniums by asexual reproduction compared with sexual reproduction.

[2 marks]

1 _____

2 _____

0 4 . 5

Suggest **two** disadvantages for garden centres of growing geraniums by asexual reproduction compared with sexual reproduction.

[2 marks]

1 _____

2 _____

2. No.6

0 6

Some students investigated the effect of drinking caffeine on reaction time.

They used a drink containing 32.25 mg of caffeine per 100 cm³

This is the method used.

1. Divide the students into four groups, **A**, **B**, **C** and **D**.
2. Measure and record the reaction time of each student using the ruler-drop test.
3. Students in:
 - group **A** drink 200 cm³ of water
 - group **B** drink 200 cm³ of the caffeine drink
 - group **C** drink 400 cm³ of the caffeine drink
 - group **D** drink 600 cm³ of the caffeine drink.
4. Repeat step 2 after 15 minutes.

0 6

. 1

Describe how to do the ruler-drop test.

[3 marks]

0 6 . 2 Table 3 shows the mass of caffeine taken in by each student.

Table 3

Group	Mass of caffeine in mg
A	0
B	64.5
C	129.0
D	X

Calculate value X.

[1 mark]

X = _____ mg

0 6 . 3 Why did group A drink water instead of the caffeine drink?

[1 mark]

Table 4 was used to convert the results of the ruler-drop test into reaction times.

Table 4

Distance in cm	Reaction time in s
2	0.064
4	0.090
6	0.111
8	0.128
10	0.143
12	0.156
14	0.169
16	0.181
18	0.192
20	0.202
22	0.212
24	0.221
26	0.230

Distance in cm	Reaction time in s
28	0.239
30	0.247
32	0.256
34	0.263
36	0.271
38	0.278
40	0.286
42	0.293
44	0.300
46	0.306
48	0.313
50	0.319
52	0.326

0 6 . 4 Estimate the reaction time for a student who recorded a distance of 23 cm

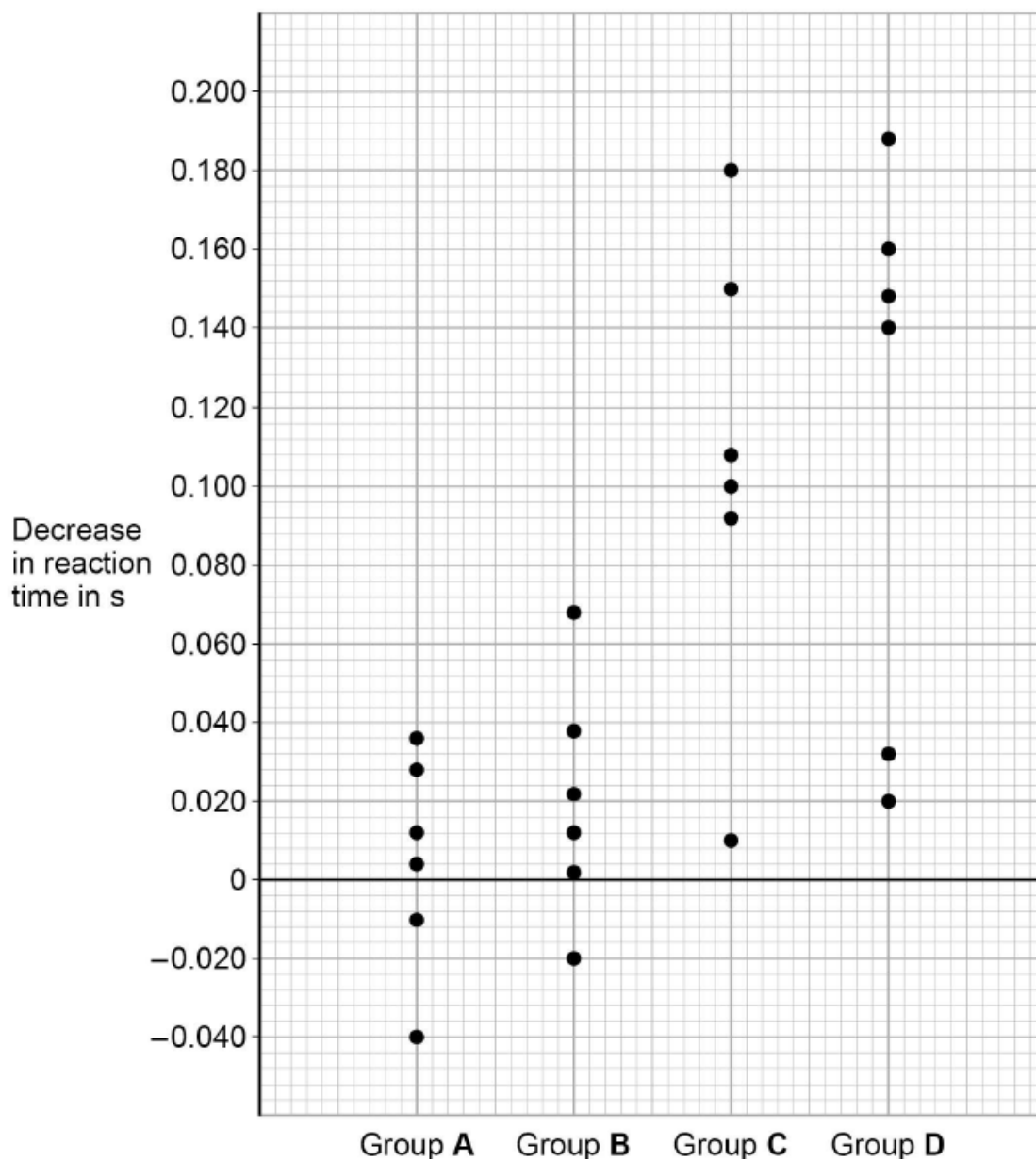
[1 mark]

Reaction time = _____ s

Students calculated the decrease in their reaction time after the drink compared with before the drink.

Figure 6 shows the results for each student.

Figure 6



0 6 . 5

Describe the effect of the mass of caffeine taken in on the decrease in reaction time.

[1 mark]

0 6 . 6 For three students the decrease in reaction time was negative.

Give the reason why the value was negative.

[1 mark]

0 6 . 7 What is the range of results for group C?

[1 mark]

0 6 . 8 Suggest **two** variables that should have been controlled in this investigation.

[2 marks]

1 _____

2 _____

0 6 . 9 Explain why the ruler-drop test does **not** involve a reflex action.

[2 marks]
