Q1. (2019)

14 Why are plant hormones used to cause parthenocarpic fruit development?

A To delay dormancy

B To selectively kill weeds

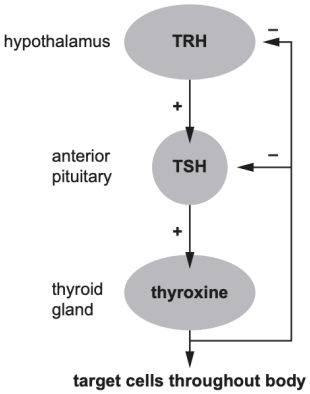
C To produce seedless fruit

D To shed leaves

Your answer ☐ **[1]**

Q2. (2019)

15 Thyroxine is a hormone controlled by negative feedback.



There is an **increase** in the metabolic rate of the body until the cells of the body have the required amount of energy.

Once the cells of the body have the required amount of energy what will happen to the levels of the three hormones in the blood?

A all three will increase

B all three will decrease

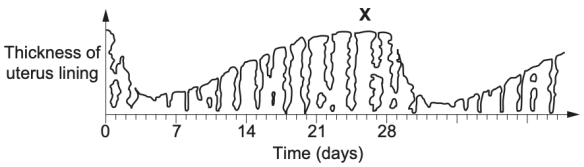
C TRH and TSH will increase and thyroxine will decrease

D TRH and TSH will decrease and thyroxine will increase

Your answer ☐ **[1]**

Q3. (2019)

19 **(a)** Look at the diagram. It shows changes to the uterus lining during the menstrual cycle.



A)

(i) Which hormone would peak at point **X**?

..... **[1]**

B)

(ii) Name **two** hormones that peak immediately before ovulation.

1 .....

2 .....

[1]

Q4. (2019) – 19b

(b) Explain how hormones can be used by women for contraception.

.....

.....

.....

.....

.....

.....

..... **[4]**

Q5. (2019) – 19c

(c) Which hormone works with insulin to control blood sugar levels in the body?

Tick (✓) **one** box.

Gibberellin ☐

Glucagon ☐

Glucose ☐

Glycogen ☐

[1]

Q6. (2019) – 19e

(e) Scientists are using human embryonic stem cells to grow cells to treat type 1 diabetes.

Explain why scientists use embryonic rather than adult stem cells.

.....

.....

.....

..... **[2]**

Q7. (2019) – 19f

(f) Plant development is also controlled by hormones.

Describe **one** effect of gibberellins and **one** effect of ethene on plant development.

gibberellins .....

.....

ethene .....

..... **[2]**

Q8. (2020)

12 A side effect of some antibiotics is to inhibit the release of thyroxine into the blood.

What will these antibiotics do to levels of TSH and TRH?

A Both decrease

B Both increase

C Both stay the same

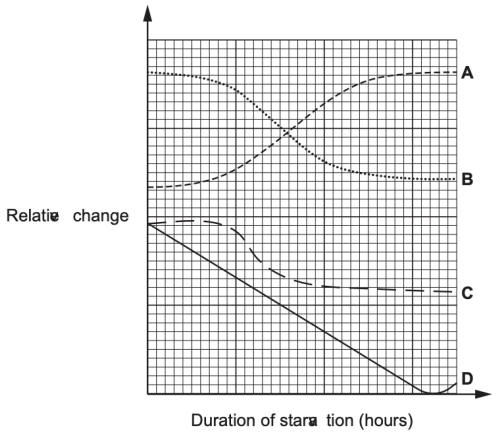
D TSH increases and TRH decreases

Your answer ☐ **[1]**

Q9. (2020)

15 Short-term starvation affects the levels of blood glucose, liver glycogen and the hormones insulin and glucagon.

Which line on the graph represents the level of glucagon in the blood during short-term starvation?



Your answer ☐ **[1]**

Q10. (2020)

20 **(a)** Carolina horsenettle is a weed that grows in crop fields in the USA.

New horsenettle shoots develop from buds on roots in spring. The shoots die in the autumn but the roots remain alive under the ground.

Effective weed control involves stopping seed production and killing the root system.

Selective herbicides are used to control Carolina horsenettle.

The best time to apply selective herbicide is when the horsenettle is actively growing between the bud and flower stage.

A)

(i) Describe how a selective herbicide works.

.....

.....

.....

..... **[2]**

B)

(ii) **Fig. 20.1** and **Table 20.1** show information about four different herbicides **A**, **B**, **C** and **D**.

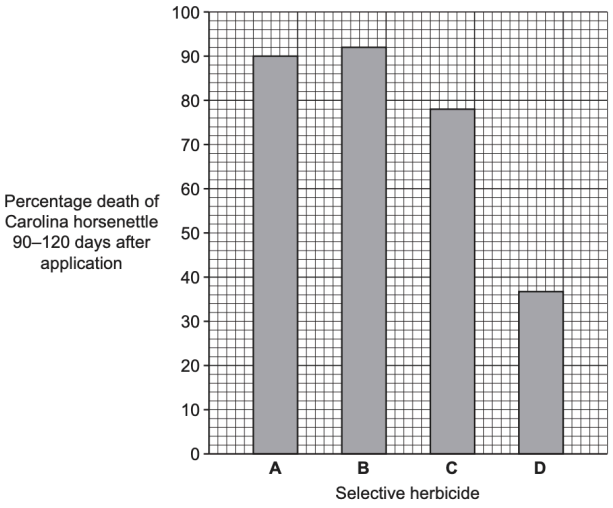


Fig. 20.1

Selective herbicide	**A**	**B**	**C**	**D**
Effect on Carolina horsenettle	prevents seeds and roots of plants growing	prevents seeds and roots of plants growing	prevents seeds and roots of plants growing	prevents shoot growth and fruiting but minimal damage to roots
What plants herbicide works on	Carolina horsenettle	Carolina horsenettle and several other broad-leaved plant species	Carolina horsenettle	Carolina horsenettle and most other broad-leaved plant species
Cost of herbicide	medium	high	medium	low

Table 20.1

Carolina horsenettle is growing in a field with a crop and other broad-leaved weeds.
Evaluate the information on selective herbicides **A**, **B**, **C** and **D**.

Which selective herbicide would be best to use and when it should be applied?
Explain your decision.

.....

.....

.....

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.....

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.....

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..... **[4]**

C)

(b) **(i)** Describe **one** effect that gibberellin hormones have on plants.

..... **[1]**

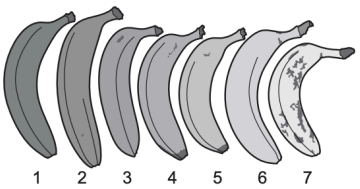
D)

(ii) A student investigates ripening in bananas.

The student keeps bananas in different conditions. After 1 week he decides if each banana was **ripe** or **not ripe**.

The results were difficult to interpret so he planned to develop the experiment.

He found a picture that he thought he could use.



Explain how this could help develop his experiment.

.....

.....

..... **[2]**

E)

(c) A process in cells is involved in producing a chemical that causes ripening of fruit.
Look at **Fig. 20.2**.

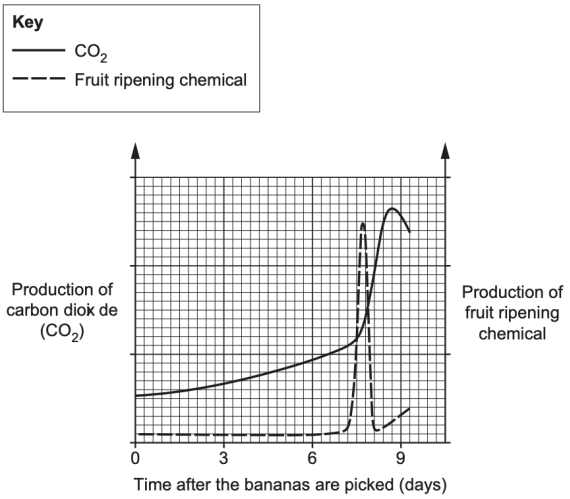


Fig. 20.2

Use evidence from **Fig. 20.2** to suggest what this process might be.

.....

.....

.....

..... **[2]**

Q11. (2020) – 22b

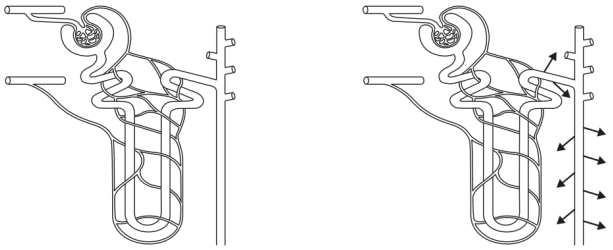
A)

(ii) Alcohol inhibits ADH production.

Person **A** and **B** both drank one small 100 ml drink.
Only one of the drinks was high in alcohol.

Look at the diagram of a kidney tubule in person **A** and **B** after the drink.

Person A **Person B**



→ Movement of water

Explain how you can tell from the diagram that person **A**'s drink contained alcohol.

.....

.....

..... **[2]**

B)

(iii) After the alcohol has been removed from person **A**'s body, control mechanisms will correct the excess loss of water caused by the alcohol.

Describe these control mechanisms.

.....

.....

.....

..... **[2]**

Q12. (2021)

13 Which description is **not** a use of plant hormones by people?

A As a selective herbicide.

B To control the translocation of sugars in phloem.

C To produce roots on plant cuttings.

D To stimulate parthenocarpy for fruit development.

Your answer ☐ **[1]**

Q13. (2021)

16 Polymenorrhea is a condition which affects the menstrual cycle.

Symptoms of the condition include the time between ovulation and the next period being shorter than usual.

A)

(a) (i) What is the name of the hormone that could treat the symptoms of this condition?

Tick (✓) **one** box.

FSH ☐

Oestrogen ☐

Progesterone ☐

Testosterone ☐

[1]

B)

(ii) Describe how the hormone chosen in part **(a)(i)** would help.

.....

..... **[1]**

Q14. (2021)

A)

20 (a) (i) Adrenaline is produced by the body and prepares it for vigorous exercise.

Complete the sentences about adrenaline.

Adrenaline is a hormone made by ..... glands.

Hormones are ..... messengers that travel in the blood.

[2]

B)

(ii) Explain how **two** changes caused by adrenaline prepare muscles for exercise.

1 .....

.....

.....

2 .....

.....

.....

[2]

C)

(iii) Explain how muscle cells get the energy needed to work during exercise.

.....

..... **[2]**

Q15. (2022)

6 Which hormone should be used to ripen fruit?

A Ethene

B FSH

C Gibberellins

D Thyroxine

Your answer ☐ **[1]**

Q16. (2022)

10 Farmers can control a cow's menstrual cycle using hormones.
Hormones controlling the menstrual cycle of a cow are the same as those in humans.

Which hormone would a farmer use to stimulate egg production?

A FSH

B LH

C Oestrogen

D Progesterone

Your answer ☐ **[1]**

Q17. (2022)

17 The female menstrual cycle is regulated by hormones.
As women get older, they go through a stage called menopause when their periods stop.

- Doctors can determine if a woman is going through menopause by measuring the level of FSH in their blood.
- If the FSH level goes above 30 mIU/mL, this indicates that menopause may have started.

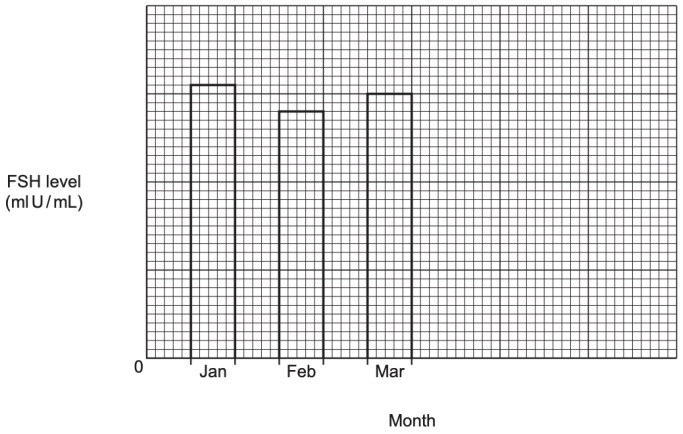
A patient has her FSH levels measured each month for six months as shown in the table.

Month	FSH level (mIU/mL)
January	31
February	28
March	30
April	32
May	30
June	33

A)

(a) (i) Complete the bar chart for the remaining values from the table.

Finish the scales for both axes.



[2]

B)

(ii) What evidence is there to suggest this patient **may** have started menopause?

.....

..... **[1]**

C)

(iii) The doctor decides they need more evidence to confirm if the patient has started menopause.

Suggest what further evidence the doctor should collect.

.....

.....

..... **[2]**

D)

(b) The doctor discusses a treatment called hormone replacement therapy (HRT) with the patient.

The doctor gives the patient a leaflet about HRT.

Information about HRT

HRT usually contains the hormones oestrogen and progesterone.

Benefits of HRT

When some women reach the menopause, it can affect their health.

They can get hot flushes, mood swings and it can weaken their bones.

These symptoms can be reduced by taking HRT.

Risks of HRT

HRT increases the risk of blood clots and, if you are overweight, this risk is increased further.

HRT increases the risk of heart disease in people over the age of 60.

Taking HRT for more than a year can increase the risk of breast cancer.

A 56-year-old patient is deciding if she should take HRT. She is overweight.

Discuss what factors the patient should consider when trying to decide whether to take HRT.

.....

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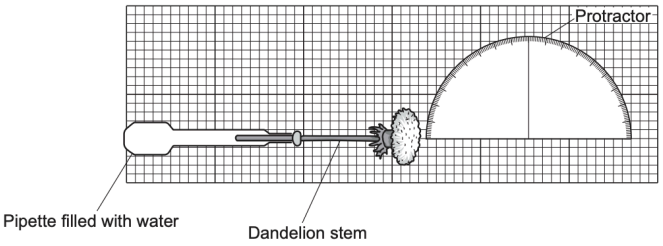
.....

..... **[3]**

Q18. (2022)

18 A student investigates the effect of gravity on dandelion stems.

The diagram shows the equipment they use.



- The student places the equipment in a dark room.
- The dandelion stem is horizontal at the start of the investigation.
- During the investigation the stem moves upwards.
- Each hour the student uses a protractor to measure the upward movement of the dandelion stem.

Their results are shown in the table.

Time (hours)	Amount of upward movement (°)
0	0
1	10
2	27
3	45
4	59
5	74
6	90

A)

(a) Describe and explain the results of this experiment.

Use ideas about hormones.

.....

.....

.....

.....

.....

..... **[4]**

B)

(b) The student is asked how long it took for the stem to reach an angle of 90°.

Their answer was 6 hours.

How could the student alter their investigation to provide a more accurate answer?

.....

.....

..... **[2]**

C)

Q19. (2022) – 20e

(e) Thyroxine can cause changes in heart rate and breathing rate.

Name another hormone that causes an increase in heart rate and breathing rate.

..... **[1]**

Q20. (2023)

6 Which hormone can be used as a selective weedkiller?

A Auxin

B Ethene

C Gibberellin

D Thyroxine

Your answer ☐ **[1]**

Q21. (2023)

21 IVF is a fertility treatment which involves egg cells being fertilised by sperm in a laboratory before transferring embryos into a female's uterus.

In this procedure a female's natural menstrual cycle is controlled using hormones.

Four hormones are used:
- GnRHα – a hormone that prevents the development of eggs
- hCG – a hormone that triggers the final stage of egg development
- FSH
- progesterone.

A)

(a) Complete the table to identify the hormone that should be used at each stage of this procedure.
One has been filled in for you.

Stage in IVF procedure	Hormone to be used
A hormone is used to stop a female's natural cycle.	
The female is then stimulated to produce a large number of immature eggs.	
The eggs produced by the female are matured 12 hours before they are collected.	hCG
The female's uterus lining is maintained for 14 days after egg collection.	

[2]

B)

(b) In IVF, the number of egg cells collected from each female differs.

This table shows the number of eggs collected from 10 females.

Female	Number of eggs collected
1	3
2	8
3	9
4	12
5	24
6	8
7	10
8	10
9	8
10	11

(i) Write down **two** conclusions about the number of eggs produced by females in this process.

1 .....

.....

2 .....

.....

[2]

C)

(ii) Only 60–80% of the eggs collected from a female will be mature and therefore able to be used for IVF.

Of the mature eggs collected, only 70–80% will be fertilised.

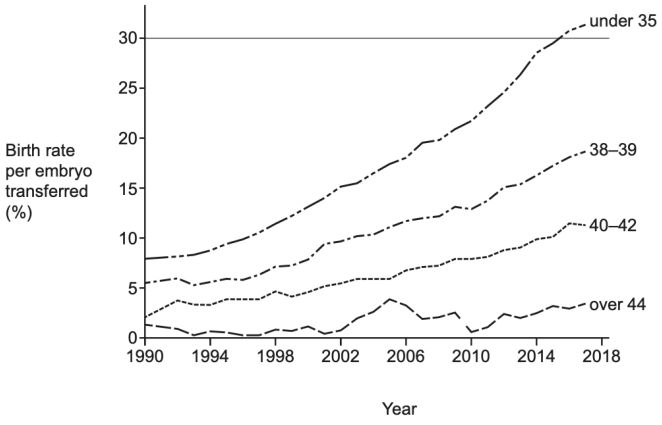
Calculate the **maximum** number of eggs that can be fertilised if a female produces 10 eggs in one cycle.

Give your answer to the nearest whole number.

Maximum number of eggs = ... **[2]**

D)

(c) The graph shows the birth rate per embryo transferred for some different age groups of females between 1990 and 2017.



Give **two** conclusions that can be made from the graph.

Conclusion 1 .....

.....

Conclusion 2 .....

.....

[2]

Q22. (2023)

A)

23 **(a)** Hormones are released when an athlete is preparing for and running a marathon.

Complete the sentences below to describe the hormones involved before and during the race.

Use the words from the list.

adrenaline	**digestive**	**endocrine**	**glucagon**	**glucose**
glycogen	**insulin**	**nervous**	**thyroxine**	

Before the race, the athlete's body needs to prepare for action. The body responds by secreting the hormone ..... .

This hormone causes blood to be diverted from the ..... system to the muscles.

During the race, blood sugar levels will decrease, so another hormone called ..... will be released.

This results in stores of ..... being used to maintain the blood sugar levels allowing the athlete to complete the marathon.

[4]

B)

(b) Hormones are part of the endocrine system.

Describe **two** differences between the endocrine system and the nervous system.

1 .....

.....

2 .....

.....

[2]

Q23. (2024)

10 Which hormones are used in the female contraceptive pill?

A FSH and LH

B LH only

C Oestrogen only

D Progesterone and oestrogen

Your answer ☐ **[1]**

Q24. (2024)

A)

20 Plant hormones have a variety of effects on plants.

(a) Plant hormones control many processes in plants.

Complete these sentences by writing the correct plant hormones in the gaps.

Each hormone can be used more than once.

Flowers are sometimes sprayed with ..... to produce fruits without seeds.

After fruits are picked, they can be exposed to ..... to make them ripen.

Flowers are stimulated to open, and seeds made to break dormancy by the hormone ..... .

Selective weedkillers and rooting powders usually contain ..... .

[4]

B)

(b) Plant hormones are also responsible for controlling the growth of stems.

Describe how cells are produced to allow stems to grow.

.....

.....

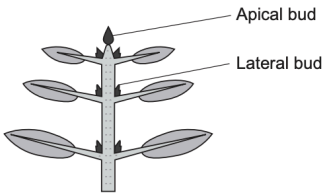
.....

..... **[2]**

C)

(c) **Fig. 20.1** shows buds growing on a plant.

Fig. 20.1



The apical bud affects the growth of the lateral buds. This effect is called apical dominance.

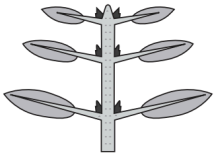
A scientist investigates how auxin produced in the apical bud prevents the growth of the lateral buds.

The results of the experiment are shown in **Fig. 20.2** and **Fig. 20.3**.

Fig. 20.2

The apical bud is cut off and the plant is left to grow for two weeks.

Fig. 20.3



The apical bud is cut off and auxin is applied to the top. The plant is left to grow for two weeks.

Explain how the results of the experiment support the theory that auxin from the apical bud prevents the growth of lateral buds.

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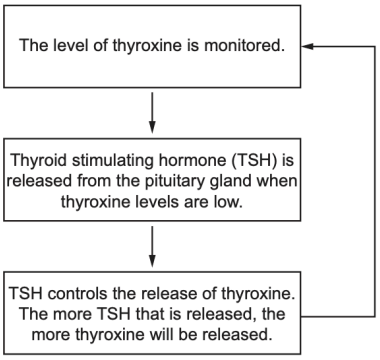
..... **[2]**

Q25. (2024)

23 Thyroxine is a hormone that regulates metabolism.

The diagram outlines how the release of thyroxine is controlled by the body.



A)

(a) Explain the processes involved in negative feedback and how they are used in the control of thyroxine.

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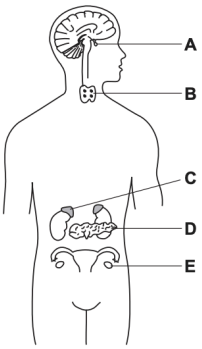
..... **[3]**

B)

(b) This diagram shows the position of different endocrine glands in the body.



Identify the letter on the diagram that shows the position of:

- the pituitary gland .....
- the gland that produces thyroxine ..... .

[2]

C)

(c) Describe how hormones are transported around the body to their targeted organs.

.....

.....

.....

..... **[2]**