

Organism level system – 2022 GCSE Gateway Biology A**1. June/2022/Paper_J247/03/No.6**

Which hormone should be used to ripen fruit?

- A** Ethene
- B** FSH
- C** Gibberellins
- D** Thyroxine

Your answer

[1]**2. June/2022/Paper_J247/03/No.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]**3. June/2022/Paper_J247/03/No.11**

The table shows some features of blood vessels.

	Valves along the length	Thickness of walls	Diameter of lumen
A	yes	thick	wide
B	no	thin	narrow
C	yes	thin	wide
D	no	thick	narrow

Which row in the table correctly describes the structure of arteries?

Your answer

[1]

4. June/2022/Paper_J247/03/No.17

The female menstrual cycle is regulated by hormones.

As women get older, they go through a stage called menopause when their periods stop.

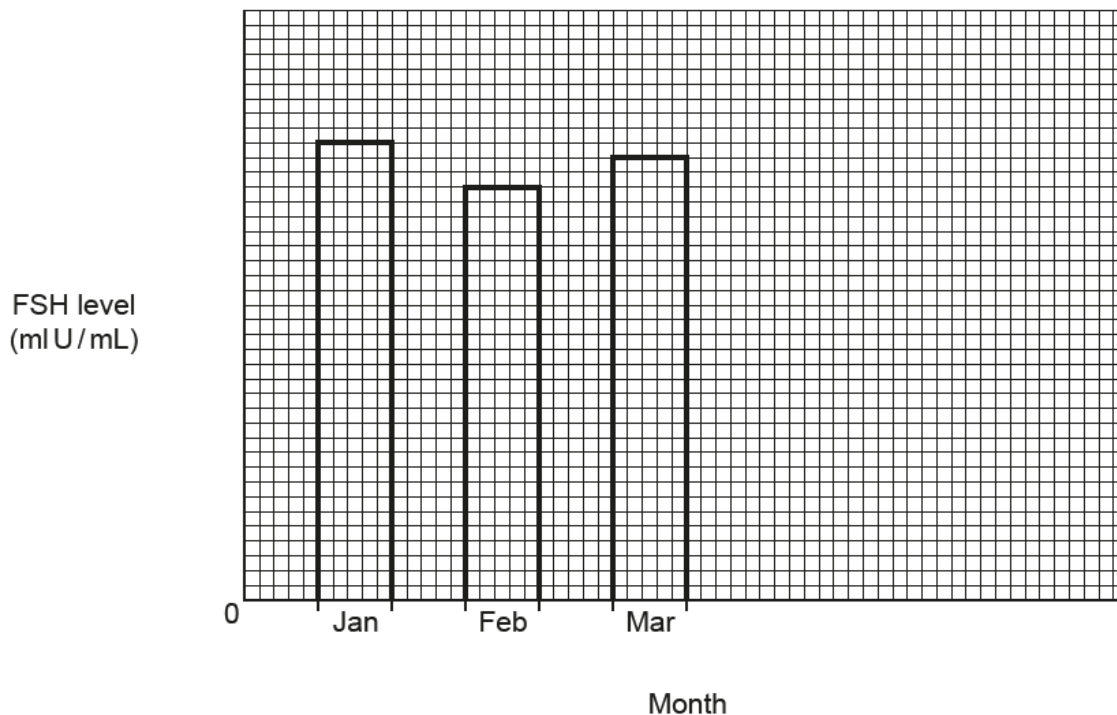
- Doctors can determine if a woman is going through menopause by measuring the level of FSH in their blood.
- If the FSH level goes above 30 mIU/mL, this indicates that menopause may have started.

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

Finish the scales for both axes.



[2]

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

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

- (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]

- (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.

.....

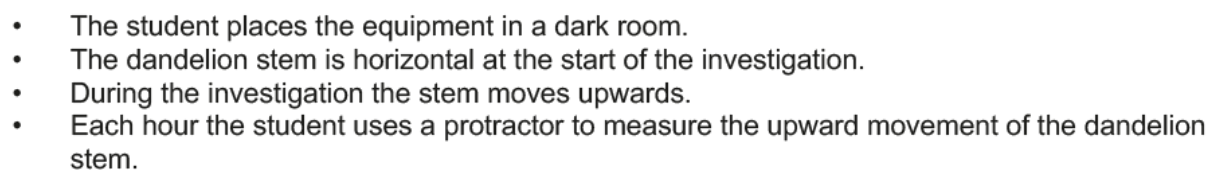
.....

.....

.....

..... [3]

The diagram shows the equipment they use.



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

Use ideas about hormones.

..... [4]

(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) Give **one** effect of the hormone gibberellin in plants.

..... [1]

6. June/2022/Paper_J247/03/No.19

In 2018, a newspaper headline suggested that a cure for blindness had been found.

The newspaper was reporting on a study looking at operations in patients with age-related macular degeneration (AMD). In AMD, part of the retina is damaged.

- (a) Describe the role of the retina **and** suggest why damage to this part of the eye could cause blindness.

.....

.....

.....

..... [2]

- (b) There are two types of AMD, wet and dry.

In wet AMD, tiny blood vessels 5 – 10 μm in size grow as the body tries to repair the retina.

Name the type of blood vessels that grow.

..... [1]

- (c) During the study, researchers used embryonic stem cells to try to repair the sight of two individuals with wet AMD.

- (i) One year later, both patients' eyesight had improved.

Explain why the newspaper headline claim of a cure may be misleading.

.....

.....

.....

..... [2]

- (ii) Suggest **one other** factor the researchers need to find out before this treatment is made widely available to all people with AMD.

.....

..... [1]

7. June/2022/Paper_J247/01/No.7

A student investigates the effect of light intensity on the rate of photosynthesis.

They count the number of gas bubbles released by a plant under water.
The table shows their results.

Light intensity	Number of gas bubbles		
	Repeat 1	Repeat 2	Repeat 3
Low	6	7	8
Medium	10	10	11
High	13	19	14

Which number could be classed as anomalous (an outlier)?

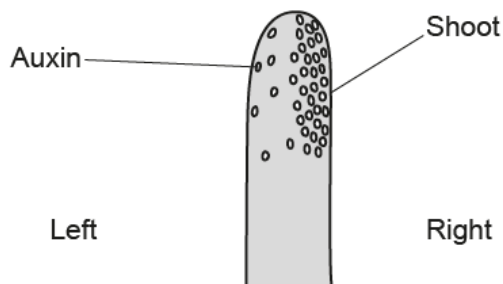
- A 6
- B 8
- C 11
- D 19

Your answer

[1]

8. June/2022/Paper_J247/01/No.12

The diagram below shows the distribution of auxin in a shoot.



What will happen to the shoot?

- A The shoot will bend to the left.
- B The shoot will bend to the right.
- C The shoot will grow upwards and will not bend.
- D The shoot will not grow.

Your answer

[1]

9. June/2022/Paper_J247/01/No.19

A boat with ten people onboard capsizes and all ten people are found in the sea.

The first aiders at the scene take the body temperature of each of the ten people.

Rescued person	Body temperature after rescue ($^{\circ}\text{C}$)
1	35.2
2	35.0
3	34.9
4	34.8
5	35.1
6	35.1
7	34.8
8	34.9
9	35.0
10	34.9

- (a) (i) Calculate the mean temperature of the ten people rescued.

Give your answer to 1 decimal place.

Mean temperature = $^{\circ}\text{C}$ [2]

- (ii) If a person's body temperature is below 35°C , they are classed as hypothermic.

What percentage of those rescued would be classed as hypothermic?

Percentage hypothermic = % [2]

(iii) Describe how the body responds to hypothermia.

.....

.....

.....

..... [3]

(iv) The body needs to maintain a constant body temperature.

Write down **one** other feature of the internal environment of the body that should be kept constant.

..... [1]

(b) A study in the British Medical Journal looked at 35488 people to see if there were differences in individuals' normal body temperatures.

They found the following:

- the mean body temperature was 36.6 °C
- 95% of the population had a body temperature between 35.7 °C and 37.3 °C.

The study did **not** include people with infections or severe illnesses.

(i) The British Medical Journal is a peer-reviewed journal.
Explain why scientists publish their results in peer-reviewed journals.

.....

.....

.....

..... [2]

(ii) Explain why the study did **not** include people with infections or severe illnesses.

.....

.....

..... [2]

(iii) Give **one** reason why a study such as this should have a large sample size.

.....

..... [1]

10. June/2022/Paper_J247/01/No.20

(a) A person is finding it difficult to read road signs at a distance whilst driving.

(i) Describe the eye defect this person could have.

.....

.....

..... [2]

(ii) Suggest how this eye defect can be corrected.

.....

.....

..... [1]

(b) Write down the role of the ciliary body in the eye.

.....

..... [1]

(c) A condition called dry eye can be caused by damage to the corneal cells in the eye.

- Dry eye can now be treated using stem cells.
- The stem cells are taken from the patient's own tissues and not from a donor.

Suggest why the stem cells used in this treatment are taken from the patient's own tissues.

.....

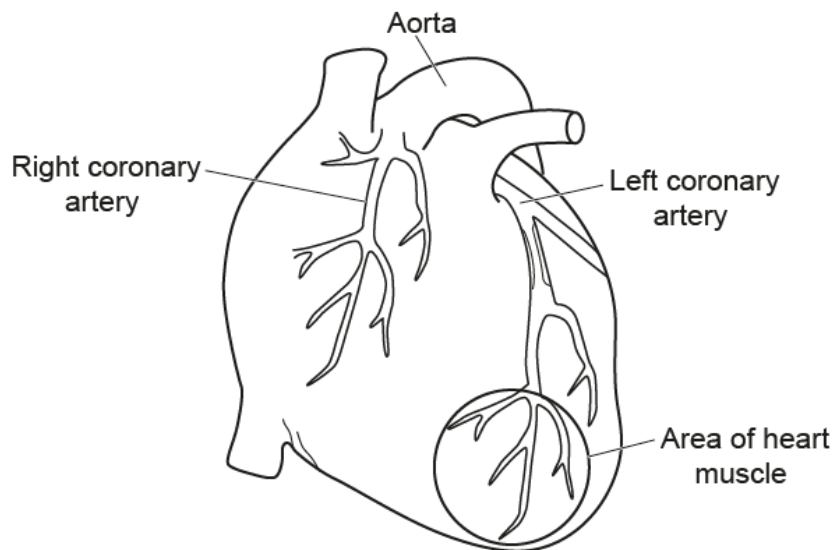
..... [1]

[6]

[6]

12. June/2022/Paper_J247/02/No.16

The diagram shows the heart of a person who has heart disease.



(a) Complete each sentence below about the diagram. Use words from the list.

attack	carbon dioxide	fat	fibre
infection	nitrogen	oxygen	water

Heart disease is caused by blocking the blood vessels that supply the heart muscle.

This means that the area of heart muscle circled in the diagram will not get enough glucose or for respiration.

This may cause it to stop beating. This is called a heart

[3]

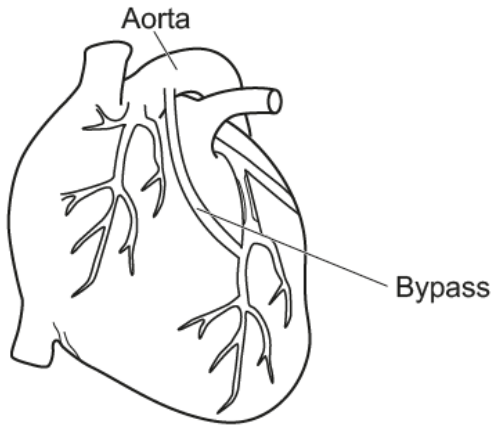
(b) Which factors can **increase** the risk of a person getting heart disease?

Tick (✓) **two** boxes.

eating vegetables	<input type="checkbox"/>
inheriting certain genes	<input type="checkbox"/>
regular exercise	<input type="checkbox"/>
smoking cigarettes	<input type="checkbox"/>

[1]

- (c) This diagram shows the heart after a type of operation called a bypass. A bypass is when a blood vessel from another part of the body is transplanted into the blood vessel of the heart.



Explain how the operation would help to reduce the risk of heart disease.

.....

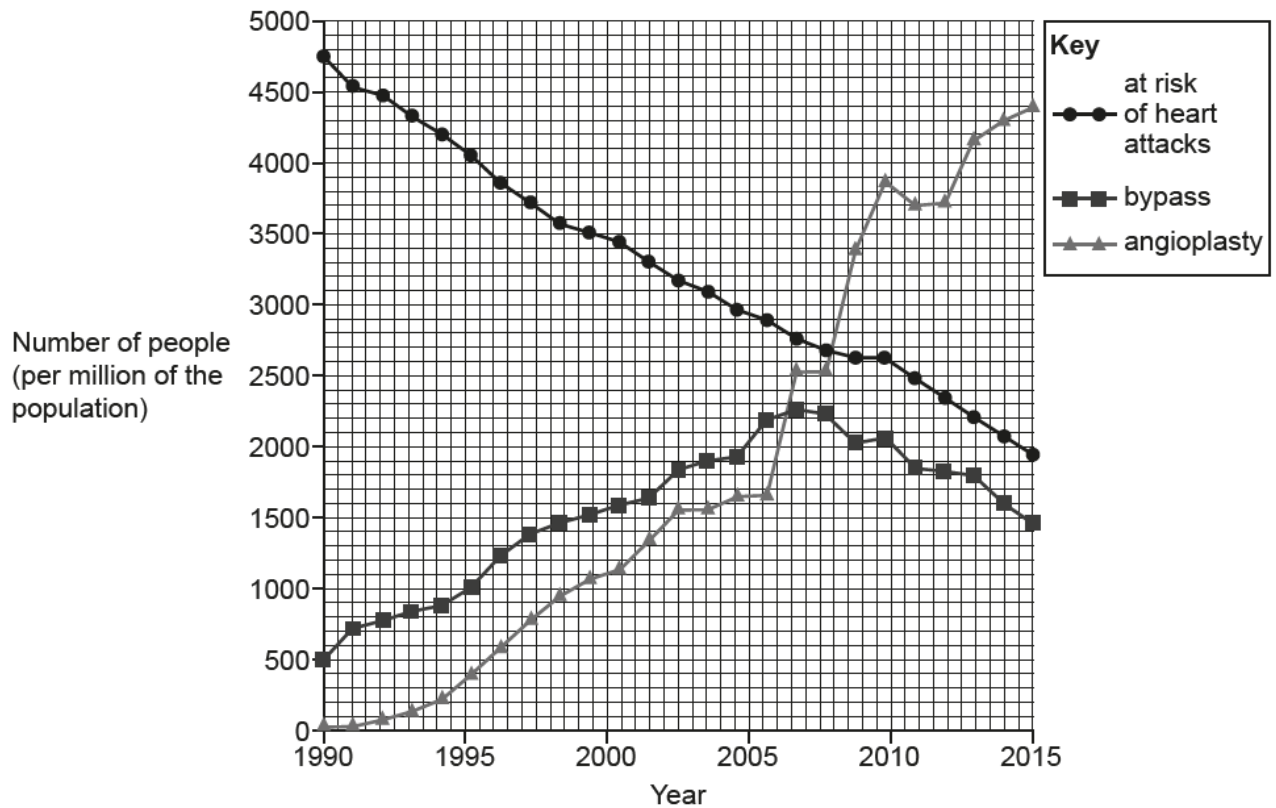
.....

.....

..... [2]

- (d) An angioplasty can also be used to treat heart disease.

The graph shows the number of both types of operations performed in the USA from 1990 to 2015. It also shows the number of people considered to be at high risk of a heart attack.



- (i) In 1990, the population of the USA was 250 million.

Calculate the number of people that had a bypass operation in the USA in 1990.

Number of people = [2]

- (ii) Use the graph to suggest **two** reasons why the number of bypass operations decreased from 2006 to 2015.

1

.....

2

.....

[2]

- (e) Heart disease causes damage as muscle cells can be replaced with scar tissue.

This makes the heart less efficient at pumping blood, which affects all the cells of the body. Doctors can treat heart disease by injecting the heart muscle with stem cells.

Explain how this could improve the lives of people with heart disease.

.....

.....

.....

.....

..... [3]

13. June/2022/Paper_J247/02/No.7

Which of these is a **biotic** factor that can affect organisms?

- A Light
- B pH of soil
- C Predators
- D Temperature

Your answer

[1]