Community level systems – 2022 GCSE Gateway Biology Combined Science A

1. May/2022/Paper_J250/07/No.6

Which combination of hormones is often found in contraceptive pills?

A FSH and oestrogen

B FSH and progesterone

C Oestrogen and progesterone

D Oestrogen, progesterone and FSH

Your answer ☐ **[1]**

2. May/2022/Paper_J250/08/No.3

Which term describes **all** the different organisms living in an environment?

A Community

B Ecosystem

C Population

D Species

Your answer ☐ **[1]**

3. May/2022/Paper_J250/08/No.12

(a) Complete these sentences about different factors that affect the ecosystem.

Use the words or phrases in the list.

abiotic	**biotic**	**carbon dioxide**	**food**	**oxygen**
pH in soil	**predators**	**temperature**		

Living organisms affecting the ecosystem are known as ..... factors.

Physical factors that affect living organisms are described as ..... factors.

Physical factors that can directly affect the rate of photosynthesis include

..... and ..... concentration.

[3]

(b) A student investigates the relationship between bean plants and the bacteria that live in the roots of the bean.

They think the bacteria live inside root nodules.

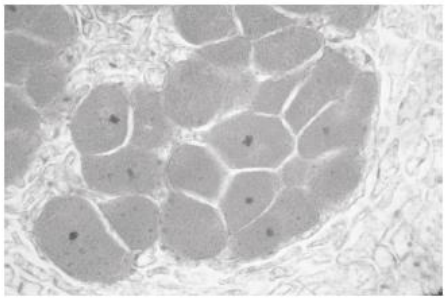
Fig. 12.1 shows root nodules on a bean plant.

Fig. 12.1

The student takes a thin section of the nodule and looks at it under a light microscope.

Fig. 12.2 shows bacteria inside the root nodule.

Fig. 12.2



(i) Describe how to take a **thin** section of the nodule **and** prepare it to view under a light microscope.

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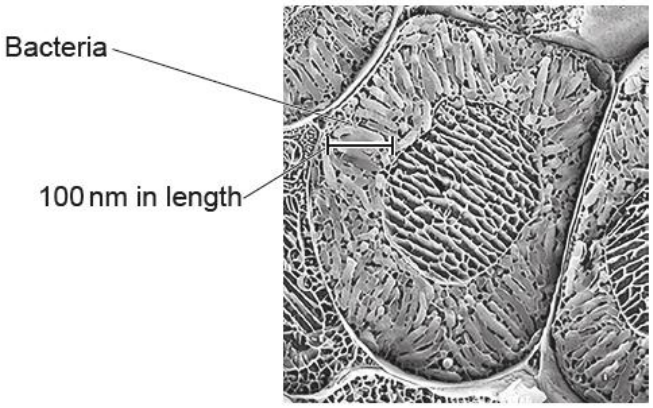
..... **[3]**

(ii) The bacteria were **not** visible clearly using a light microscope.

The student found an image taken using a different type of microscope.

Fig. 12.3 shows this image.

Fig. 12.3



The maximum resolution of a light microscope is 200 nm.

What type of microscope is used to take this image?

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

(c) The bacteria live inside the bean plant cells in root nodules. The bacteria are able to take nitrogen gas from the air and turn it into nitrates. The plants use nitrates to make amino acids.

Explain the relationship between the bacteria and the bean plant.
Include ideas about photosynthesis in your answer.

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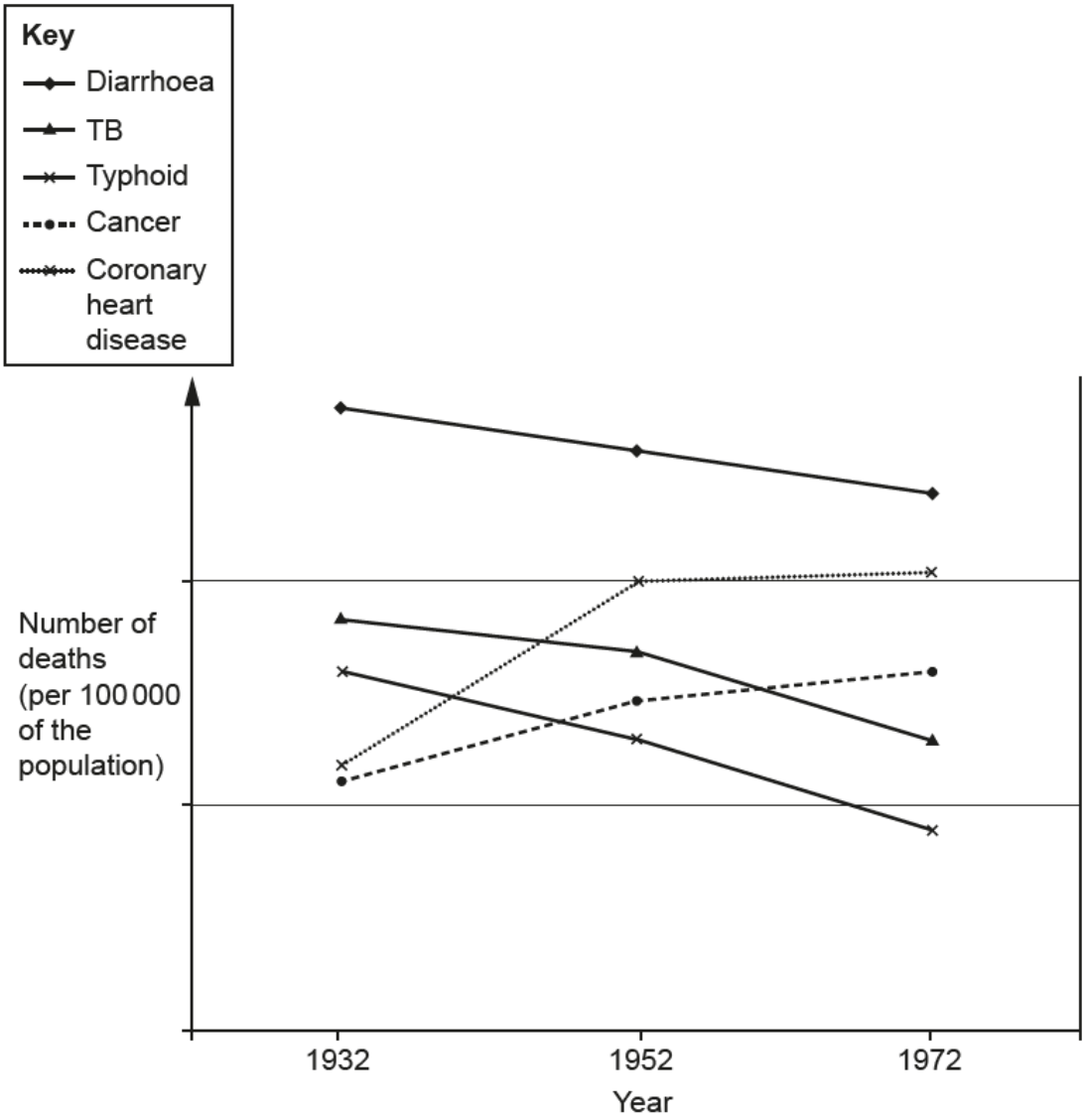
..... **[3]**

4. May/2022/Paper_J250/08/No.14

(a) The deaths in one country from different diseases were measured over a 40-year period.

Lifestyle and living conditions in this country changed during the 40 years of the study.

The graph shows the number of deaths per 100 000 of the population for each disease.



(i) The diseases can be grouped into communicable and non-communicable diseases. The graph shows the trends of these two different types of disease over the 40-year period.

Complete the sentences explaining these trends shown in the graph.

Communicable diseases have .....

.....

Non-communicable diseases have .....

.....

[2]

(ii) Suggest how lifestyle and living conditions in this country might have changed to cause the trends shown in the graph.

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

(b) To calculate the death rate in a given year, the following formula is used:

$$\text{death rate per } 100\,000 = \frac{\text{number of deaths} \times 10^5}{\text{population size}}$$

In 1972, the population was 55 million. The death rate from coronary heart disease was 28 deaths per 100 000 people.

Calculate the number of deaths from coronary heart disease in 1972.

Number of deaths = ... **[2]**

(c) The immune system provides a defence against bacterial diseases like TB (tuberculosis).

Part of this defence involves the production of antibodies.

Describe how antibodies help defend the body. Use ideas about antigens in your answer.

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

(d) What does a vaccination contain **and** why does it protect the body from infection?

Vaccinations contain .....

.....

Vaccinations protect the body because .....

.....

[2]

5. May/2022/Paper_J250/02/No.5

Which row shows the size of each group from smallest to largest?

A class → family → order → phylum

B family → order → class → phylum

C order → phylum → family → class

D phylum → class → order → family

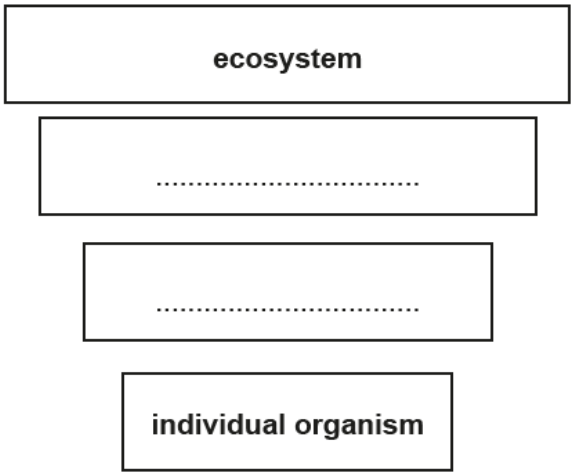
Your answer ☐ **[1]**

6. May/2022/Paper_J250/02/No.11

(a) The diagram shows some of the levels of organisation within the ecosystem.

Complete the diagram using words in the list.

biomass	**community**	**population**	**predator**	**prey**



[2]

(b) Explain why the carbon cycle is important to plants.

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.....

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

(c) Microorganisms have an important role in the carbon cycle.

Complete these sentences about microorganisms.

Microorganisms break down dead organisms releasing nutrients such as nitrogen. This process is called ..... .

Microorganisms will also convert the carbon in their food to carbon dioxide in a process called ..... .

The reaction to produce carbon dioxide releases energy. This makes it an ..... reaction.

[3]