Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

BIOLOGY **0610/22**

Paper 2 Multiple Choice (Extended) **May/June 2018**

45 minutes

Additional Materials: Multiple Choice Answer Sheet
Soft clean eraser
Soft pencil (type B or HB is recommended)

* 1 7 5 1 7 1 8 7 5 6 *

READ THESE INSTRUCTIONS FIRST

Write in soft pencil.
Do not use staples, paper clips, glue or correction fluid.
Write your name, Centre number and candidate number on the Answer Sheet in the spaces provided unless this has been done for you.
DO **NOT** WRITE IN ANY BARCODES.

There are **forty** questions on this paper. Answer **all** questions. For each question there are four possible answers **A**, **B**, **C** and **D**.
Choose the **one** you consider correct and record your choice in **soft pencil** on the separate Answer Sheet.

Read the instructions on the Answer Sheet very carefully.

Each correct answer will score one mark. A mark will not be deducted for a wrong answer.
Any rough working should be done in this booklet.
Electronic calculators may be used.

This syllabus is approved for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

This document consists of **16** printed pages.

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1 Which organisms carry out respiration, growth, movement and excretion?

A all animals and all plants

B animals only

C arthropods and flowering plants only

D plants only

2 The diagram shows an animal whose scientific name is *Falco peregrinus*.



To which species does it belong?

A bird

B *F. peregrinus*

C *Falco*

D vertebrate

3 What kind of skin do amphibians have?

A dry without scales

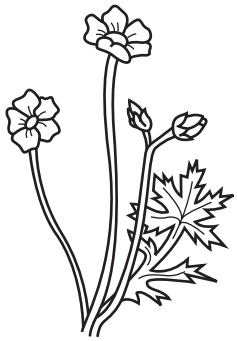
B dry with scales

C moist without scales

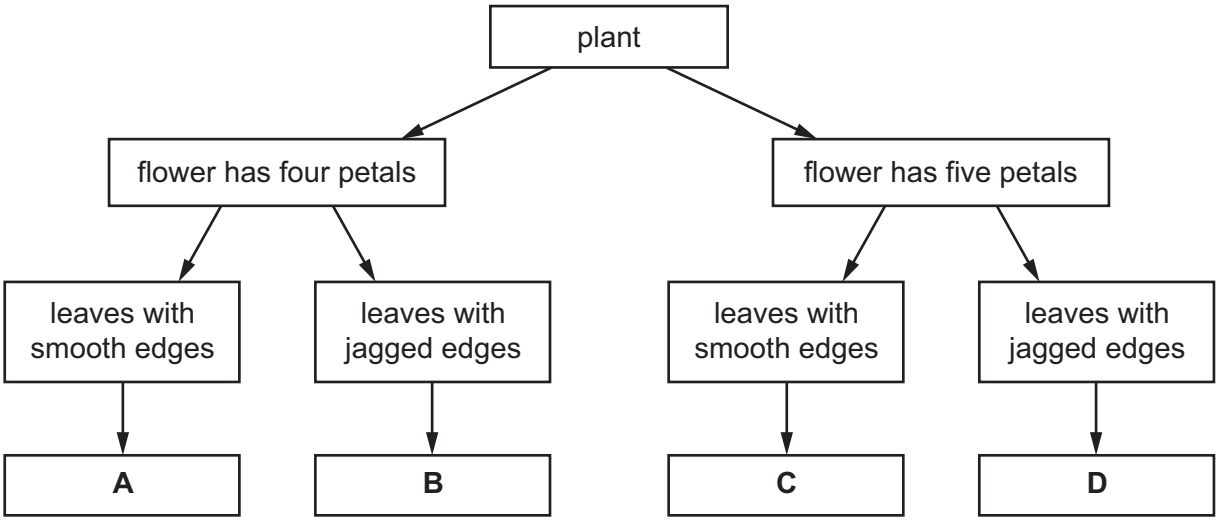
D moist with scales

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4 The diagram shows a flowering plant.



Use the key to identify the plant.



5 In which part of the cell does aerobic respiration occur?

A cytoplasm

B mitochondrion

C ribosome

D vesicle

6 Why do some root cells have root hairs?

A for the maintenance of the temperature of the cell sap

B to increase the surface area of the cells

C to increase the volume of the cell sap

D to provide a place for cell nuclei

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[Turn over

7 The table shows the concentration of gases in a blood vessel and in an alveolus.

Which row shows the conditions that cause a gas produced in respiration to diffuse from the blood vessel into the alveolus?

	gas produced	concentration in the blood vessel	concentration in the alveolus
A	carbon dioxide	low	high
B	carbon dioxide	high	low
C	oxygen	low	high
D	oxygen	high	low

8 Which part of a plant root hair is partially permeable?

A the cell sap

B the cell surface membrane

C the cell vacuole

D the cell wall

9 The table shows the results of food tests carried out on a fruit.

test	Benedict's	biuret	ethanol	iodine
result	positive	positive	negative	negative

What did the fruit contain?

A fat and reducing sugar

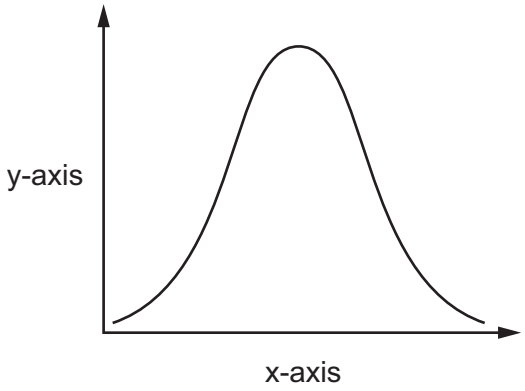
B fat and starch

C protein and reducing sugar

D protein and starch

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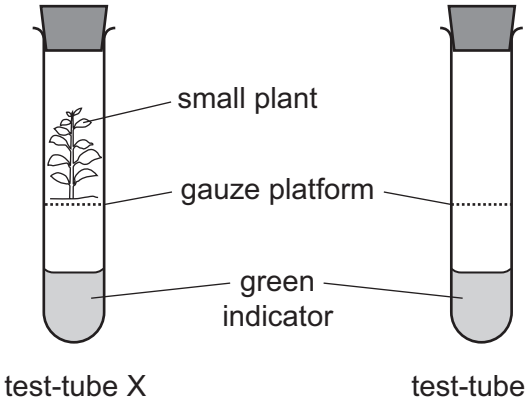
10 An experiment was carried out to investigate the effect of pH on enzyme action. The graph shows the results.



What are the labels for the x-axis and the y-axis?

	x-axis	y-axis
A	pH	rate of reaction
B	pH	time
C	rate of reaction	pH
D	time	pH

11 An experiment is set up as shown.



The green indicator turns yellow when the concentration of carbon dioxide increases. The green indicator turns blue when the concentration of carbon dioxide decreases.

After several hours, the indicator in test-tube X turned blue. The indicator in test-tube Y remained green.

Which process caused the colour change?

A germination

B photosynthesis

C respiration

D transpiration

12 Why do plants need nitrate ions?

A for making amino acids

B for making fatty acids

C for making glucose

D for making starch

13 In which part of the alimentary canal do chemical digestion and mechanical digestion take place?

A colon

B duodenum

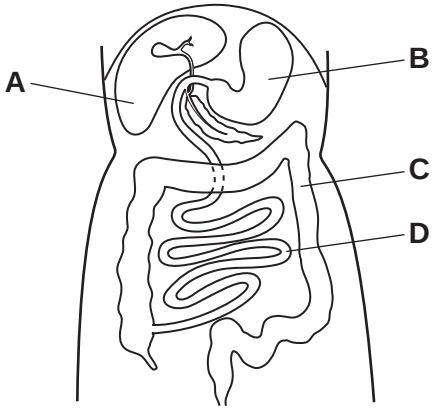
C mouth

D oesophagus

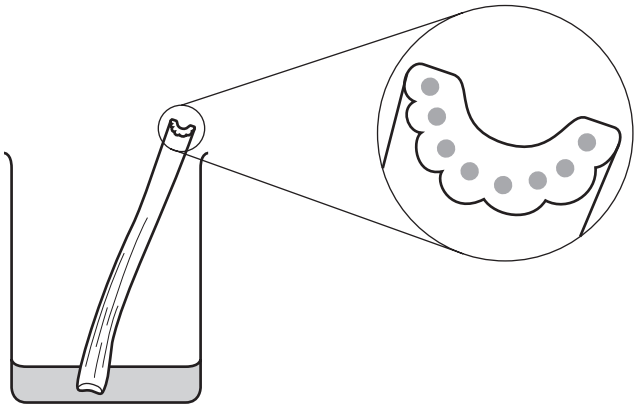
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14 The diagram shows part of the alimentary canal.

Where is most water absorbed?



15 A celery stalk was placed in a beaker which contained a red stain. After 24 hours, the red stain appeared at the top of the celery stalk.



Which structures stained red?

A cortex cells

B mesophyll cells

C phloem

D xylem

16 A student is investigating the effect of temperature on the rate of transpiration.

Which environmental conditions should be kept constant during this investigation?

	humidity	light intensity	temperature	wind speed
A	✓	✓	✓	✓
B	✓	✓	✗	✓
C	✗	✓	✗	✓
D	✗	✗	✓	✗

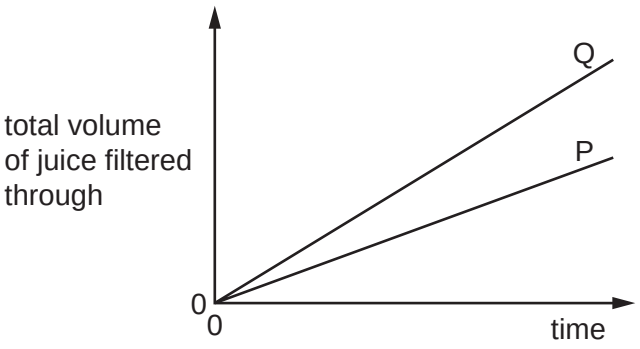
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17 A student places two samples of crushed apple into two beakers, P and Q. The samples are of equal size. She adds 5 cm^3 of pectinase solution to beaker P and 5 cm^3 of water to beaker Q.

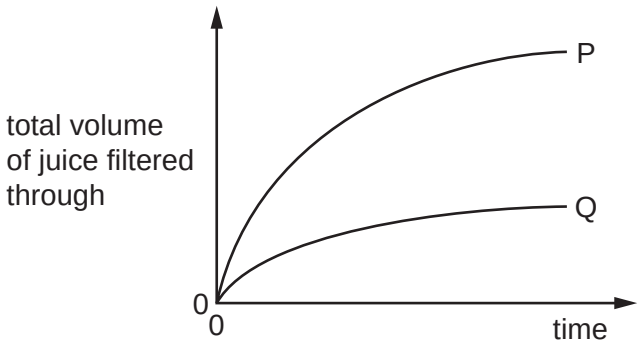
After five minutes, she places the samples of crushed apple into two different filter funnels, and measures the volume of juice filtering through from each sample over a period of 10 minutes.

Which graph shows her results?

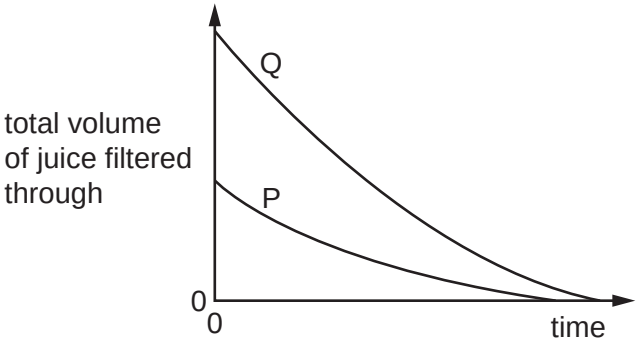
A



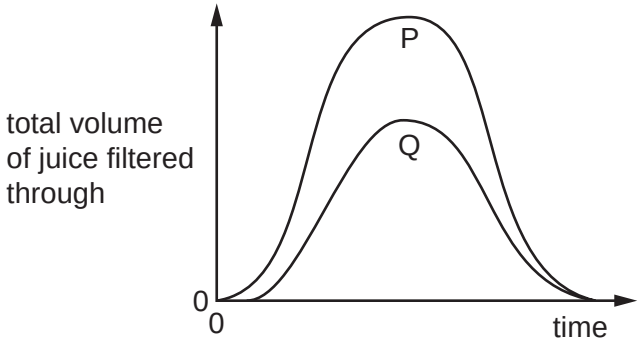
B



C



D



18 During the process of blood clotting, damage to blood vessels stimulates L, and M is converted to N.

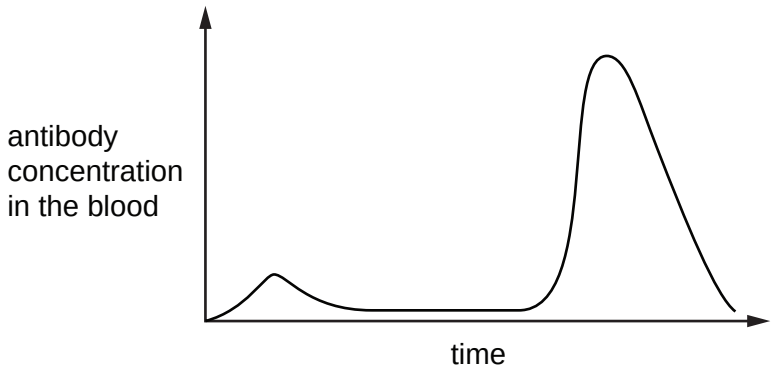
What are L, M and N?

	L	M	N
A	fibrin	platelets	fibrinogen
B	fibrinogen	platelets	fibrin
C	platelets	fibrin	fibrinogen
D	platelets	fibrinogen	fibrin

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19 A child is vaccinated against measles. After a period of time the child is infected with the measles virus.

The graph shows the concentration of measles antibodies in the child's bloodstream during this time.



Which statement is consistent with the information in the graph?

A After the vaccination, the child produced memory cells.

B The child had passive immunity against measles.

C The measles virus contains antibodies.

D The vaccination failed to protect the child against measles.

20 Muscles are responsible for the ventilation of the lungs during breathing.

Which row describes their action during the inspiration of air?

	diaphragm muscles	external intercostal muscles	internal intercostal muscles
A	contract	contract	relax
B	contract	relax	contract
C	relax	contract	relax
D	relax	relax	contract

21 Aerobic respiration involves the break down of glucose.

$$C_6H_{12}O_6 + ...x...O_2 \rightarrow ...y...H_2O + ...z...CO_2 + \text{energy}$$

Which values for x, y and z balance the equation?

	x	y	z
A	6	4	6
B	6	6	6
C	6	12	6
D	12	12	12

22 The composition of the blood in the renal vein is different to the composition of the blood in the renal artery.

What substance has a higher concentration in the renal vein than in the renal artery?

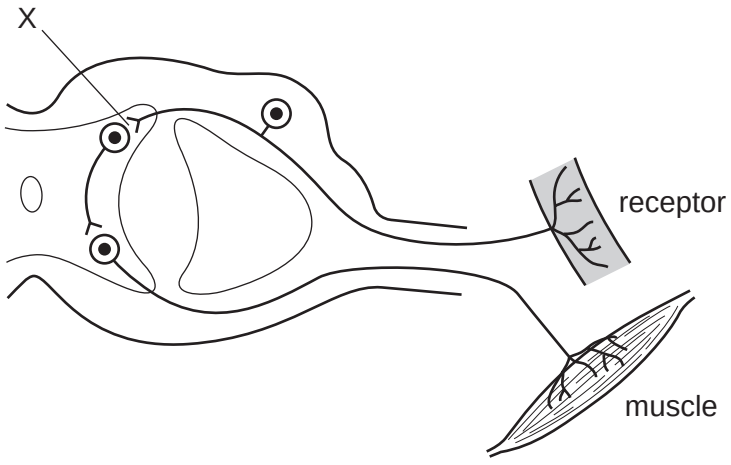
A carbon dioxide

B glucose

C oxygen

D urea

23 The diagram shows the structures in a reflex arc.



What is X?

A effector

B relay neurone

C sensory neurone

D synapse

24 Which row describes accommodation when viewing a near object?

	ciliary muscles	suspensory ligaments	lens shape
A	contracted	slackened	more spherical
B	contracted	tight	more spherical
C	relaxed	slackened	less spherical
D	relaxed	tight	more spherical

25 Hormones and the nervous system both control our bodies.

Which statement about the control provided by our hormones is correct?

A fast response and long lasting

B fast response and short lived

C slow response and long lasting

D slow response and short lived

26 Which row describes heroin?

	type of drug	location of effect
A	depressant	blood
B	depressant	synapses
C	stimulant	blood
D	stimulant	synapses

27 What is an advantage, for an organism, of using asexual reproduction?

A Disease spreads rapidly.

B It does not cause variation.

C It easily adapts to environmental change.

D Population increases rapidly.

28 The diploid number in *Ovis aries* (sheep) is 54.

How many chromosomes will there be in a zygote of this species?

A 0 **B** 27 **C** 54 **D** 108

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29 Which adaptive feature of sperm provides the energy that enables it to swim?

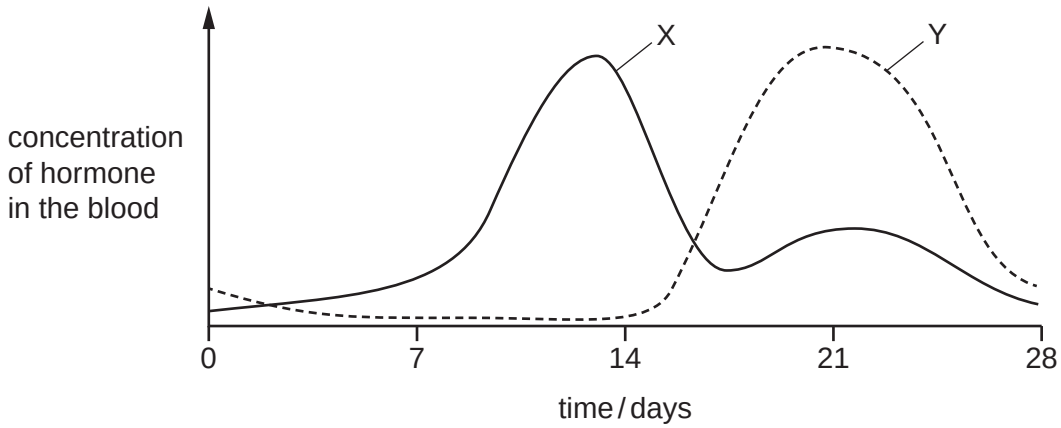
A the acrosome

B the cell membrane

C the flagellum

D the mitochondria

30 Two hormones, X and Y, are secreted by the ovaries. The graph shows the concentrations of these hormones in the blood during one complete menstrual cycle.



What are hormones X and Y?

	hormone X	hormone Y
A	FSH	LH
B	LH	FSH
C	oestrogen	progesterone
D	progesterone	oestrogen

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31 The mitotic index of a tissue is the percentage of cells in a tissue that are undergoing division.

The table shows the number of cells in two tissue samples, X and Y.

tissue sample	number of cells undergoing mitosis	number of cells not undergoing mitosis	total number of cells in the tissue sample
X	25	55	80
Y	15	95	110

Which statement is correct?

A Tissue X is growing faster with a mitotic index of 31.3%.

B Tissue X is growing faster with a mitotic index of 45.4%.

C Tissue Y is growing faster with a mitotic index of 13.6%.

D Tissue Y is growing faster with a mitotic index of 15.8%.

32 Some features of cell division are listed.

1 haploid cells are produced

2 new cells are genetically identical

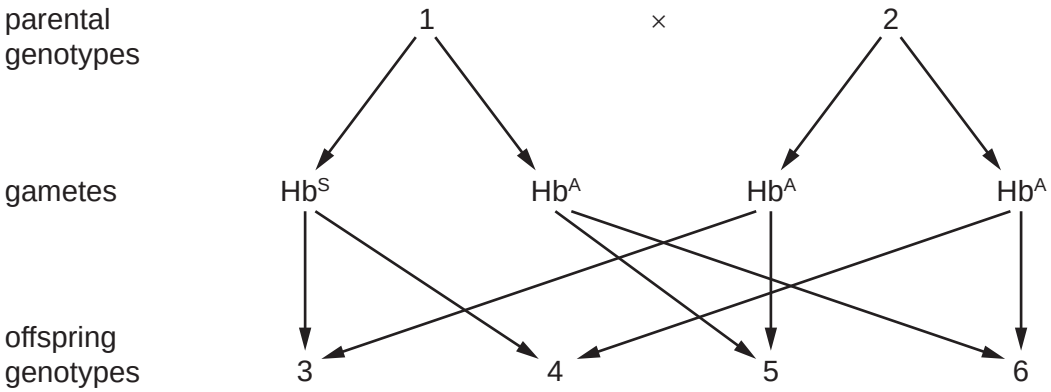
3 reduction division

4 results in variation

Which features would be associated with meiosis?

A 1, 2 and 3 **B** 1, 2 and 4 **C** 1, 3 and 4 **D** 2, 3 and 4

33 Sickle-cell anaemia is an inherited disease.



Which genotypes represented in the diagram would increase an individual's resistance to malaria?

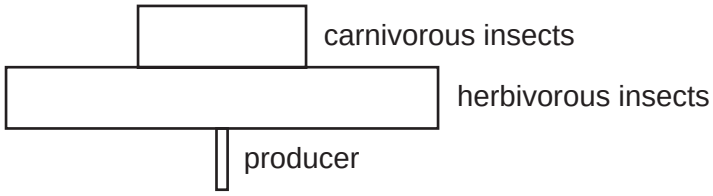
A 1, 3 and 4 **B** 1, 4 and 5 **C** 2, 3 and 4 **D** 2, 5 and 6

34 Fitness is defined as the probability of an organism ……1…… and ……2…… in the environment in which it is found.

Which words correctly complete gaps 1 and 2?

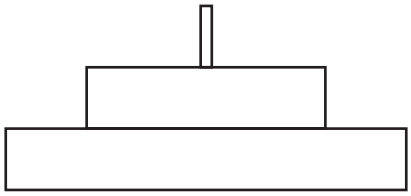
	1	2
A	photosynthesising	respiring
B	reproducing	respiring
C	surviving	reproducing
D	surviving	photosynthesising

35 A food chain has the pyramid of numbers shown.

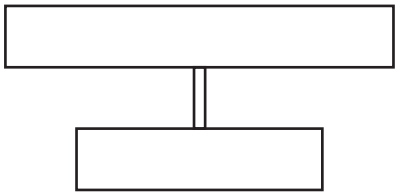


What is the pyramid of biomass for the same food chain?

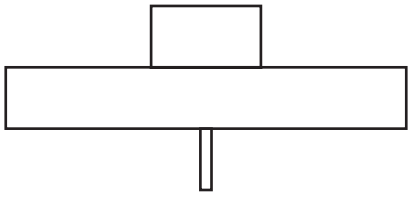
A



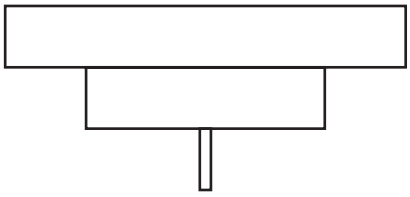
B



C

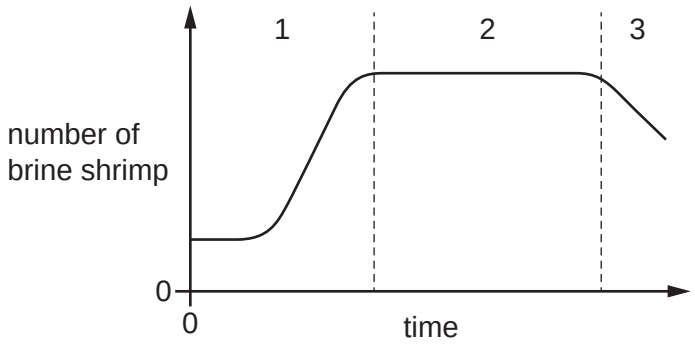


D



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36 The graph shows the changes in a population of brine shrimp over a period of time.



Over which section or sections is the birth rate greater than the death rate?

A 1, 2 and 3 **B** 1 and 2 only **C** 1 only **D** 2 only

37 What is a disadvantage of using bacteria to produce human insulin?

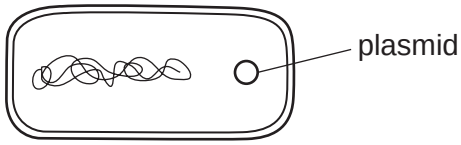
A few ethical concerns

B genetic code shared with other organisms

C they contain plasmids

D they mutate frequently

38 The diagram shows a bacterial cell containing a plasmid.



What is inserted into the plasmid if this cell is to be used for the production of insulin?

A a length of DNA from a human

B a length of DNA from another bacterium

C a molecule of insulin

D an enzyme

39 What would be unlikely to increase the risk of human famine?

A a rapidly increasing human population

B flooding of land

C lack of rain causing a drought

D the use of pesticides on crops

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40 Since 1970 sulfur dioxide emissions have dropped by 95% in some parts of the world.

What is the main reason for the reduction in emissions?

A fewer coal-powered power stations

B increase in wind turbines

C less cars on the road

D less industry

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