



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Ordinary Level

HUMAN AND SOCIAL BIOLOGY

5096/12

Paper 1 Multiple Choice

October/November 2013

1 hour

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



READ THESE INSTRUCTIONS FIRST

Write in soft pencil.

Do not use staples, paper clips, highlighters, 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 BAR CODES.

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.

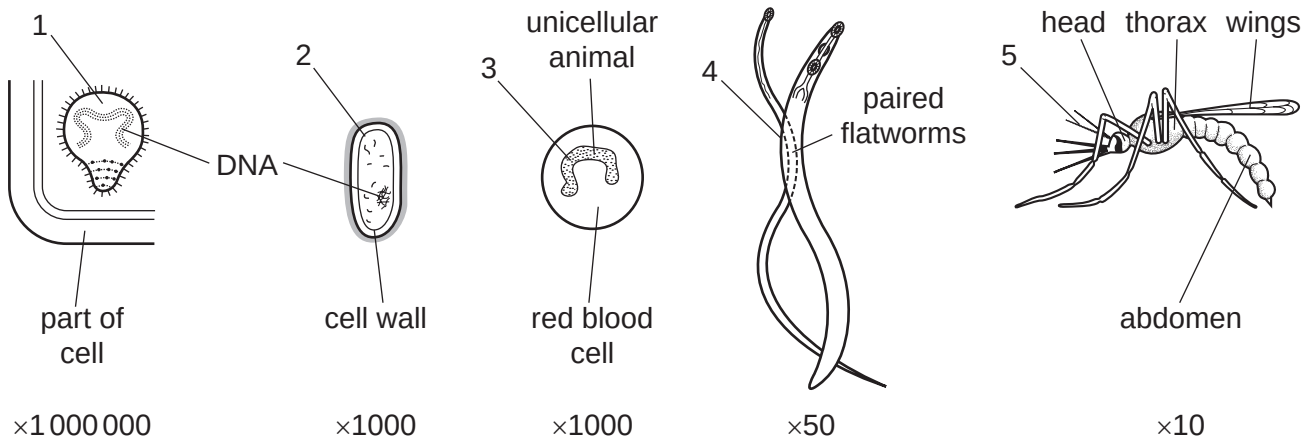
This document consists of **18** printed pages and **2** blank pages.



1 Which statement about bacteria is correct?

- A Most bacteria lack a cell membrane.
- B Some bacteria are engulfed by red cells.
- C Some bacteria are used to kill mosquitoes.
- D Some DNA in bacteria is found in the nucleus.

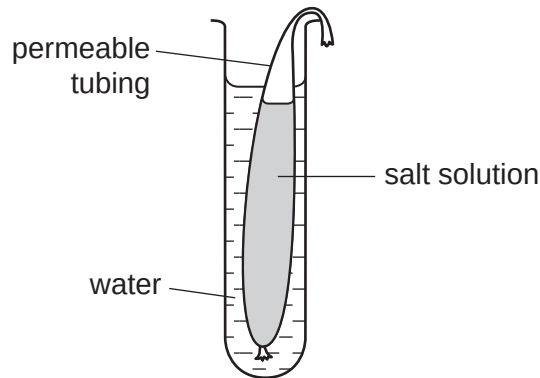
2 The diagrams show five types of organisms.



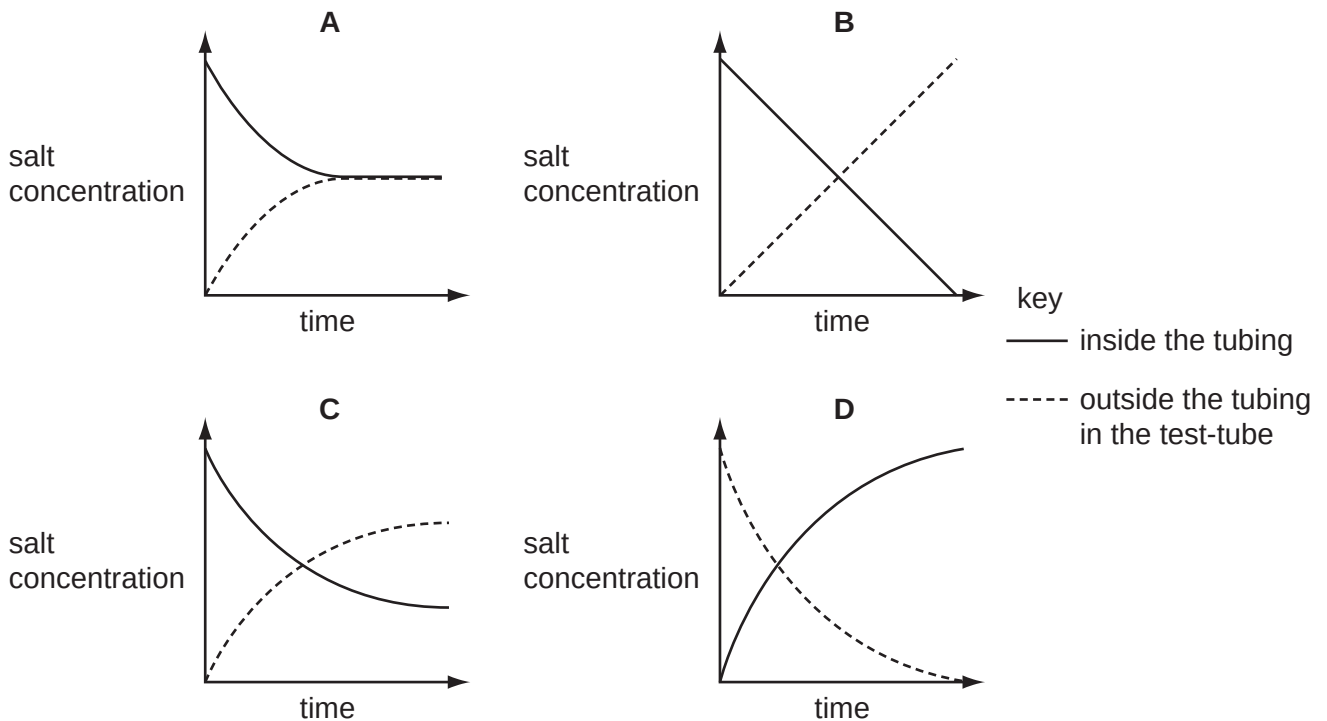
Which organisms are **always** pathogens?

- A 1 and 2
- B 1 and 3
- C 2 and 3
- D 3, 4 and 5

- 3 The diagram shows permeable tubing filled with salt solution in a test-tube of water. Salt is a small molecule that can pass through the tubing.



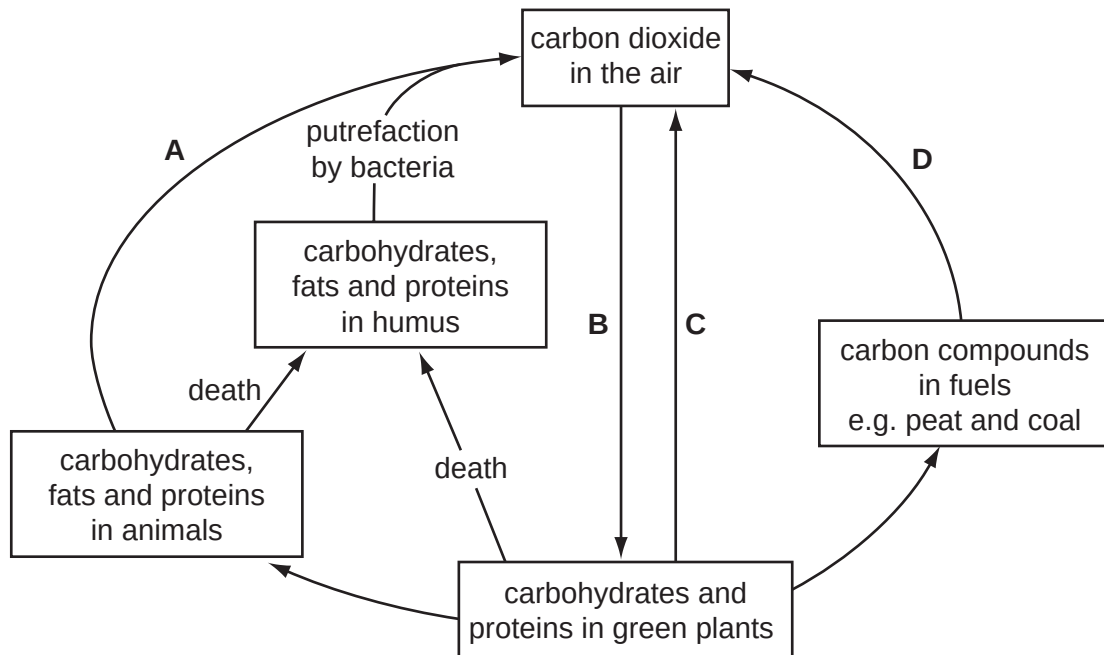
Which graph shows the changes in salt concentration inside and outside the tubing after 24 hours?



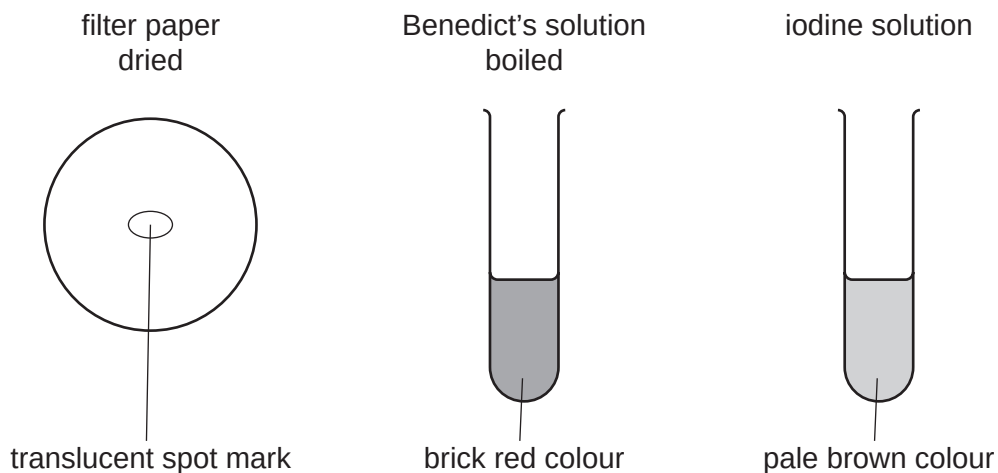
- 4 What is a product of photosynthesis in green plants and a source of energy for animals?
- A carbohydrate
 - B carbon dioxide
 - C chlorophyll
 - D oxygen

- 5 The diagram shows **processes** taking place in the carbon cycle.

During which process is oxygen released?



- 6 The diagrams show the results of three tests on a food.



Which nutrients are present?

- A** fat only
- B** fat and reducing sugar only
- C** fat, reducing sugar and starch
- D** reducing sugar and starch only

- 7 The concentration of vitamin D found in the blood of women in a community has decreased in the last 10 years.

Which changes in their behaviour explain this?

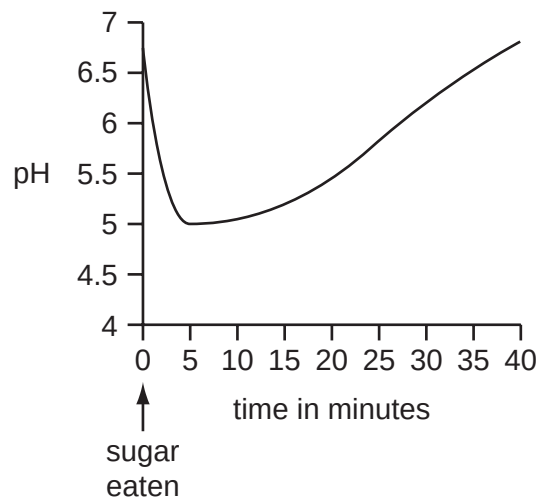
	eating more fish liver	increasing the use of the birth control pill	using high factor sun cream	wearing clothing that covers more of the body
A	yes	yes	no	no
B	yes	no	yes	no
C	no	yes	no	yes
D	no	no	yes	yes

- 8 The table shows nutrients per 100 g in four meals.

Which meal, if eaten frequently, would be **most** likely to cause an increase in weight?

	grams of nutrients per 100 g in the meal				
	protein / g	fat / g	carbohydrate / g	of which sugar / g	of which fibre / g
A	9.0	8.0	62.5	3.1	18.1
B	10.0	2.0	45.0	12.3	5.1
C	12.5	6.5	60.2	10.2	6.1
D	15.6	5.0	50.0	9.5	20.0

- 9 The graph shows the pH of plaque on the teeth after sugar was eaten.

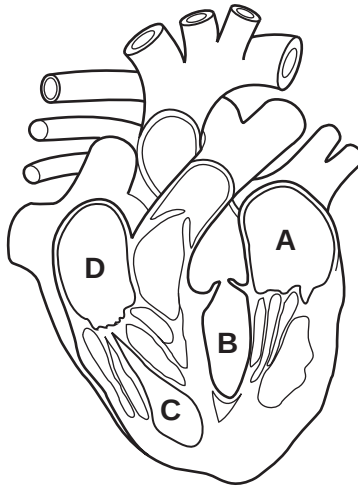


What is the likely explanation for this graph?

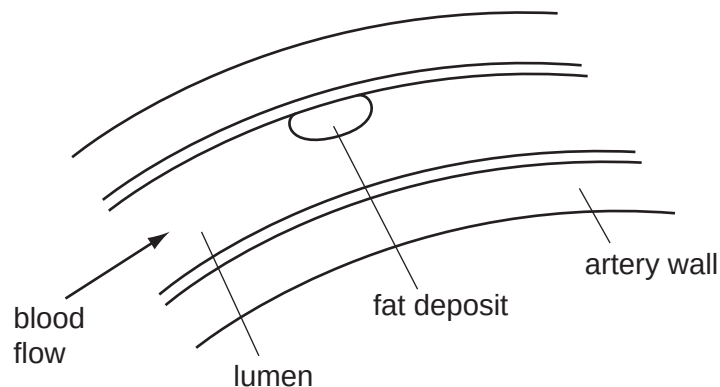
- A Amylase in saliva digests the sugar between 0 and 5 minutes after eating it.
 - B Bacteria act on the sugar producing acid between 0 and 5 minutes after eating it.
 - C Bacteria rapidly multiply between 5 and 40 minutes after eating sugar.
 - D The concentration of acid increases from 5 minutes after eating the sugar.
- 10 In which parts of the digestive system may significant amounts of starch be digested?
- A in the mouth, stomach and duodenum
 - B in the mouth and duodenum only
 - C in the mouth and stomach only
 - D in the mouth only
- 11 Which is egested?
- A exhaled air
 - B faeces
 - C sweat
 - D urine

- 12 In a medical investigation, a dye was injected into the renal artery of a patient. The dye was not filtered out of the blood in the kidneys.

Which chamber of the heart would be the first to receive blood with this dye in it?



- 13 The diagram shows a section of the coronary artery with damage that may result in a heart attack.



What best describes the events that could lead to a heart attack?

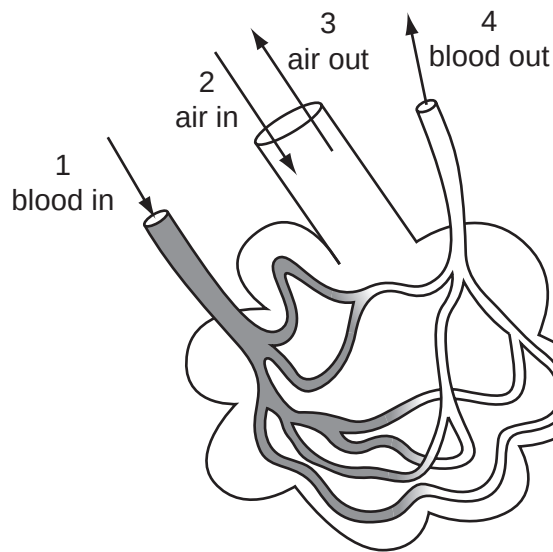
- A further fat deposits followed by platelet and red blood cell destruction
- B further fat deposits followed by platelets forming a fibrin mesh restricting blood flow
- C hardening the artery wall preventing diffusion across the wall
- D restriction of the artery lumen by a clot causing less oxygen per cm^3 of blood

- 14** A student wrote 'In these vessels there is a fluid which contains a high concentration of fatty acids and vitamin D as well as white blood cells'.

Which vessel was the student describing?

- A** bile duct
- B** capillary
- C** kidney tubule
- D** lacteal

- 15** The diagram shows an alveolus and its blood supply.



Which numbered labels indicate parts that have the highest concentration of carbon dioxide and oxygen?

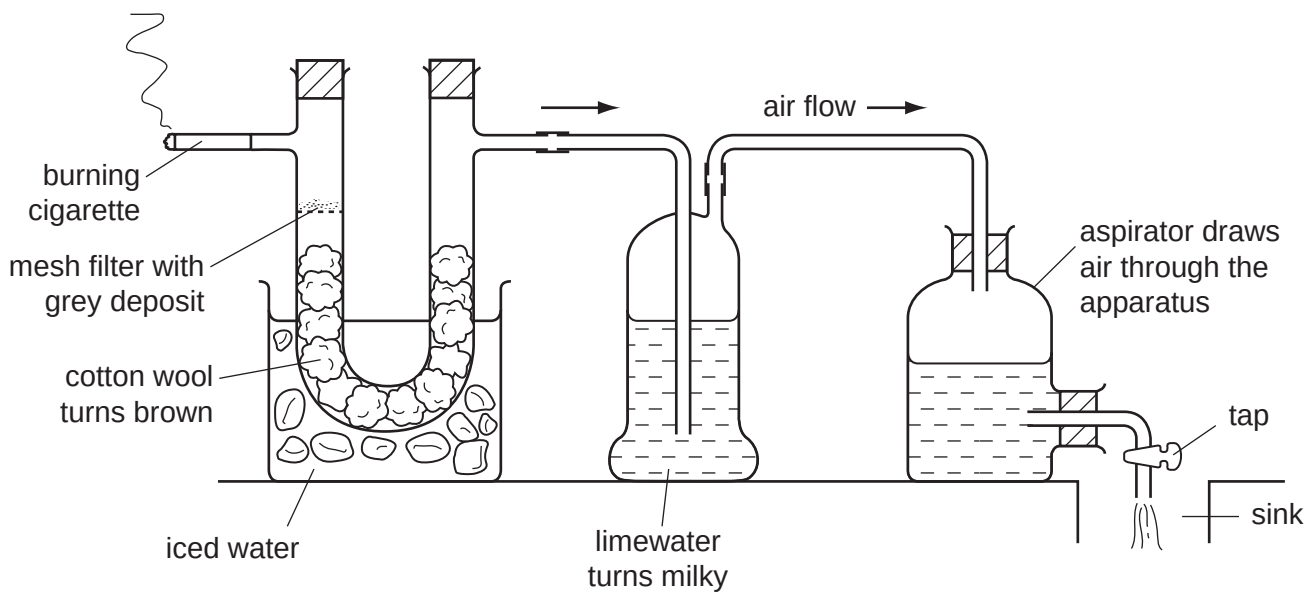
	highest concentration of carbon dioxide	highest concentration of oxygen
A	1	2
B	1	3
C	3	4
D	4	3

16 Which changes occur to the volume and pressure in the lungs while breathing out?

	volume of lungs	pressure in lungs
A	decreases	decreases and then increases
B	decreases	increases and then decreases
C	increases	decreases and then increases
D	increases	increases and then decreases

17 The diagram shows the apparatus used to show some of the materials in cigarette smoke.

The labels indicate the results after five minutes.

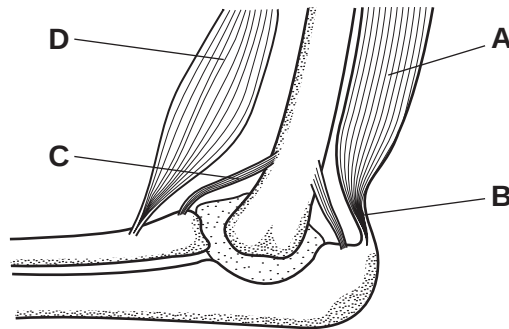


Which materials that are in cigarette smoke did this apparatus detect?

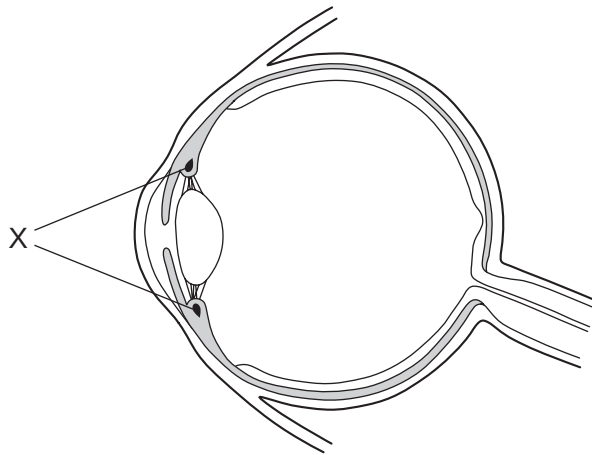
	grey deposit on mesh filter	cotton wool turns brown	limewater turns milky
A	nitrates	nicotine	carbon dioxide
B	nitrates	tar	carbon monoxide
C	particles	nicotine	carbon monoxide
D	particles	tar	carbon dioxide

18 The diagram shows the bones and muscles of the arm at the elbow joint.

Which structure will **not** change in length when the arm is raised at the elbow?



19 The diagram shows a section through the human eye.



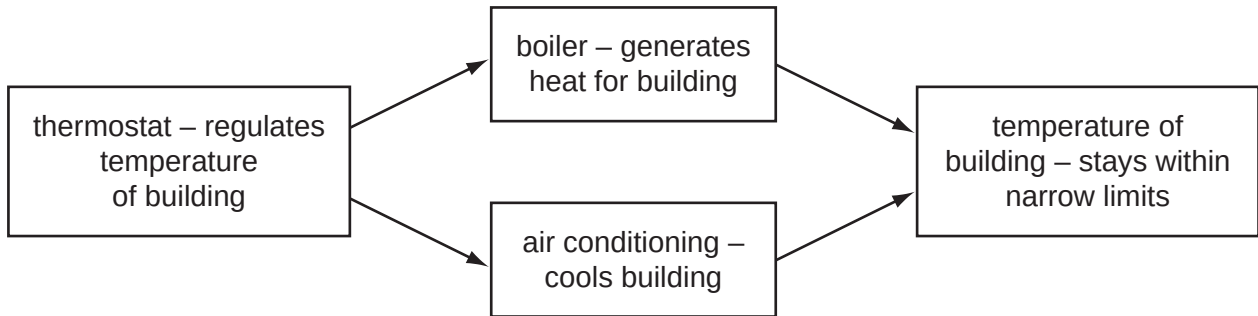
What happens when muscle X contracts?

- A The lens becomes thicker to focus on near objects.
- B The lens becomes thinner to focus on distant objects.
- C The pupil becomes smaller so that less light enters the eye.
- D The pupil enlarges so that more light enters the eye.

20 What would be normally **absent** from the glomerular filtrate in the kidney?

- A glucose
- B protein
- C salts
- D urea

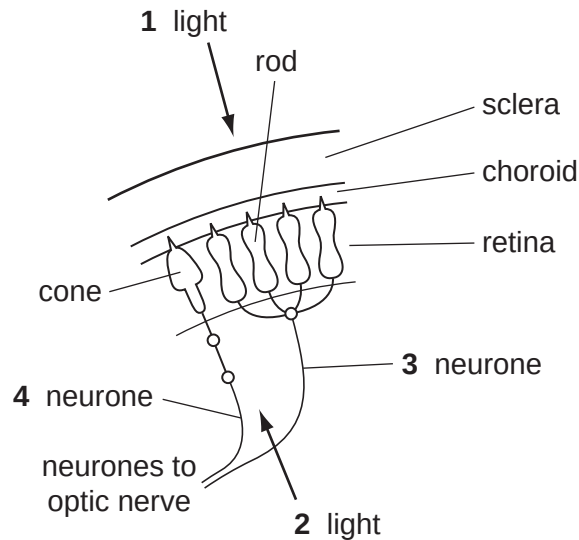
21 The diagram shows a way of regulating the temperature of a building.



Which shows the equivalent organs that regulate the temperature of the human body?

	air conditioning	boiler	thermostat
A	brain	lungs	skin
B	lungs	brain	muscles
C	skin	liver	brain
D	stomach	skin	heart

- 22 The diagram shows a very small section of the retina with microscopic detail of four rods and a cone.



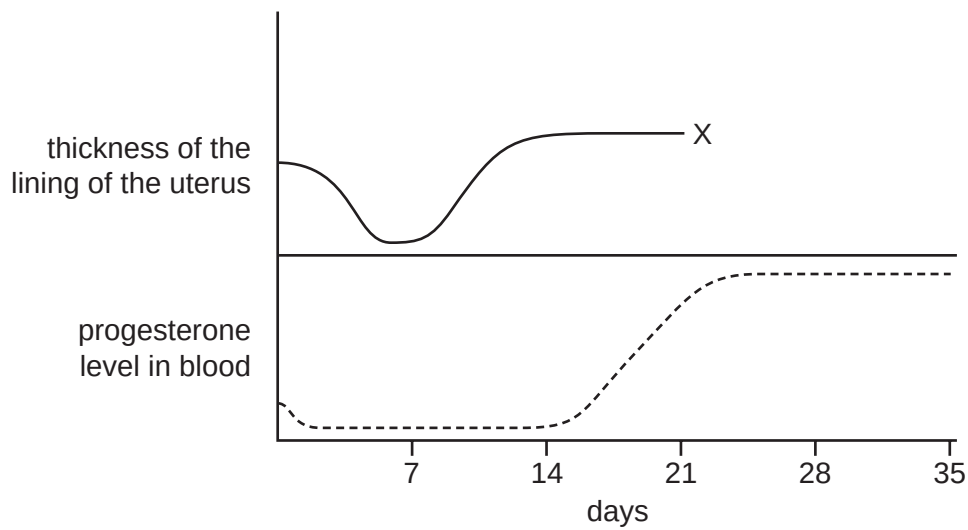
Which arrow shows the direction that the light passes to stimulate the retinal cells, and, at low level light intensity, which of the two neurones will fire impulses?

	direction of light	neurone fired
A	1	3
B	1	4
C	2	3
D	2	4

- 23 How does a nerve impulse travel across a synapse?

- A** by active transport of ions
- B** by an electrical impulse
- C** by diffusion of a chemical
- D** osmosis of water molecules

- 24 The diagram shows the relationship between progesterone levels and the thickness of the lining of the uterus.



Which segment needs to be added at X to complete the diagram?

A

B

C

D



- 25 If the mass of DNA in a normal body cell is Z, how much DNA will be present in a cell after the completion of mitosis, after completion of meiosis and in an egg after completion of fertilisation?

	after completion of mitosis	after completion of meiosis	after completion of fertilisation
A	Z	$\frac{Z}{2}$	Z
B	Z	2Z	2Z
C	$\frac{Z}{2}$	2Z	2Z
D	2Z	$\frac{Z}{2}$	Z

- 26** The albino characteristic where the skin lacks pigment is controlled by a recessive allele, *p*. Normal skin pigment is controlled by the dominant allele, *P*.

An albino father had children with a mother who had normal pigment, although one of her parents was albino.

What are the possible different genetic constitutions (genotypes) of children born to these parents?

- A** *Pp* only **B** *PP* and *pp* **C** *Pp* and *pp* **D** *pp* only

- 27** Which statement about amniotic fluid is correct?

- A** It contains minerals and vitamins for the fetus.
B It prevents excessive pressure harming the fetus.
C It provides oxygen for the fetus.
D It regulates the temperature of the fetus.

- 28** What is the last structure to pass out of the mother's womb during normal birth?

- A** baby's feet
B baby's head
C the placenta
D the umbilical cord

- 29** A World Health Organisation report states that their aim is to 'improve both the diagnosis, using new bacteriological techniques, and management of the multidrug resistant bacteria'.

Which disease is referred to?

- A** influenza
B malaria
C ringworm
D tuberculosis

- 30** What is caused by a diet low in vitamin C?

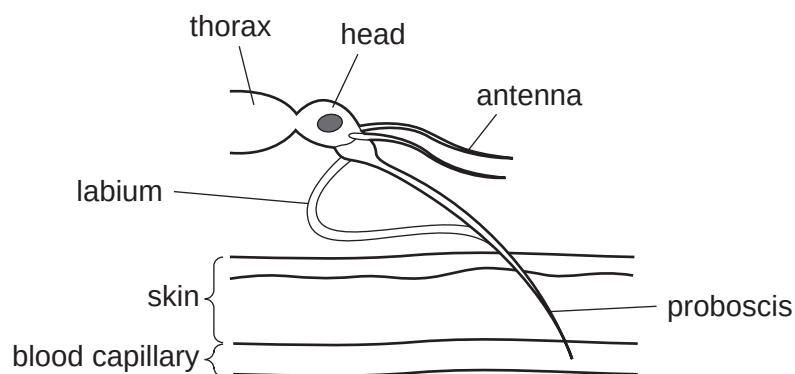
- A** Blood clots more slowly.
B Calcium ions are not absorbed from the gut.
C Children develop sickle cell anaemia.
D Wounds heal more slowly.

31 A person visits the doctor complaining of various signs and symptoms.

Which correctly lists signs and symptoms?

	signs	symptoms
A	diarrhoea, headache	rash, vomiting
B	pain, rash	diarrhoea, headache
C	rash, sweating	headache, nausea
D	shivering, tiredness	pain, sweating

32 The diagram illustrates how a vector transmits a common tropical infection.



What is the pathogen and the vector?

	pathogen	vector
A	a bacterium	a housefly
B	an <i>Anopheles</i>	a <i>Plasmodium</i>
C	a mosquito	a protozoan
D	a protozoan	a mosquito

33 What are the effects of antibiotics?

	inhibit bacterial reproduction	damage human tissues	stimulate the immune system
A	no	no	no
B	no	yes	yes
C	yes	no	no
D	yes	yes	no

34 Why should penicillin **not** be taken over a long period of time?

- A** Liver damage may occur.
- B** Penicillin accumulates in the body.
- C** Penicillin is addictive.
- D** Resistant bacteria may multiply.

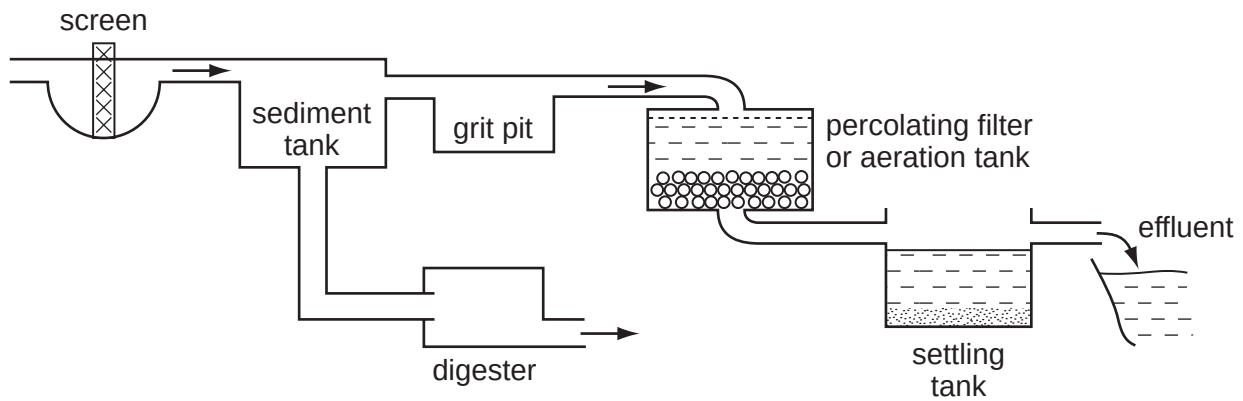
35 What will help to reduce the spread of typhoid?

- A** draining swampy areas
- B** fine wire mesh over open doors and windows
- C** not preparing food if suffering from a bad cold
- D** washing in the water supply from a deep well

36 What are injected to give active immunity?

- A** antibiotics
- B** antibodies
- C** antigens
- D** antisera

37 The diagram shows the structures in a large scale sewage works.



The sewage works will not perform properly because two of the parts are in the wrong position.

Which row correctly shows a negative effect from one of these parts in the wrong position?

	part in the wrong position	effect
A	grit pit	this will cause grit to clog up the sediment tank
B	grit pit	this will cause grit to enter the percolating filter
C	sediment tank	this will cause paper to stick and block
D	sediment tank	this will prevent sediment settling

38 Which would be most likely to have the **least** bacteria in a given volume of water?

- A** deep well
- B** lake
- C** river
- D** shallow well

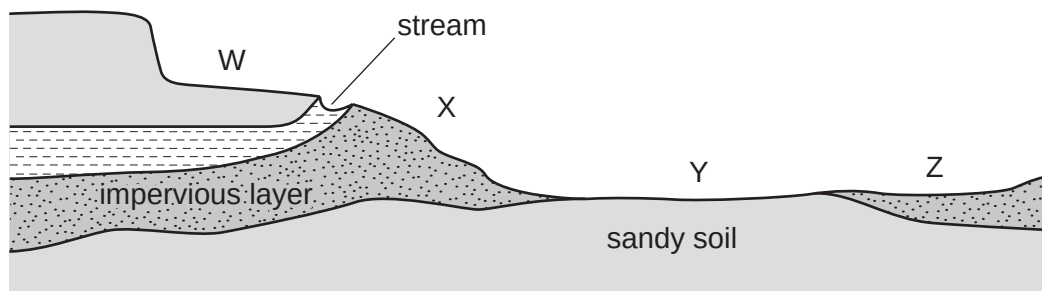
39 During hot weather it is important to empty dustbins at least once every week.

Why does this help to control the number of houseflies?

- A** Enzymes in housefly larvae are denatured by the high temperatures in dustbins.
- B** Houseflies pick up pathogenic bacteria on their feet in large numbers from dustbins.
- C** Newly laid housefly eggs can take a week to hatch out and become adult houseflies.
- D** The housefly pupae feed on decaying matter in the dustbin and create unpleasant smells.

- 40** Locations for a chemical plant, pit latrines, shallow wells and workers' houses have to be planned for a new village.

The diagram shows a section through the site with possible locations W, X, Y and Z.



What is the best location for these amenities on this site?

	chemical plant	pit latrines	shallow wells	workers' houses
A	W	X	Y	Z
B	X	W	Z	Y
C	Y	Z	X	W
D	Z	Y	W	X

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