Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

BIOLOGY **0610/22**

Paper 2 Multiple Choice (Extended) **October/November 2019**

45 minutes

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

8028550561

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.

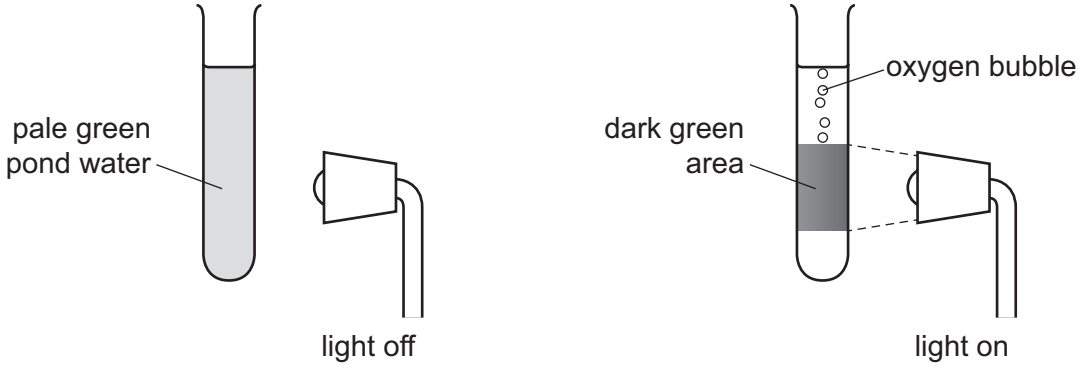
Each correct answer will score one mark. A mark will not be deducted for a wrong answer.
Any rough working should be done in this booklet.
Electronic calculators may be used.

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

This document consists of **15** printed pages and **1** blank page.

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1 The diagrams show a test-tube containing pond water. The green colour is caused by microorganisms that have chloroplasts.



Which characteristics of living organisms are shown?

A excretion, growth and movement

B movement, nutrition and sensitivity

C nutrition, reproduction and respiration

D reproduction, sensitivity and growth

2 Which shows an organism that has been named using the binomial system?

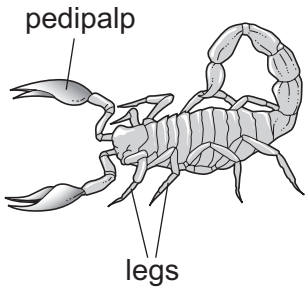
A *Brown seaweed*

B *Polar bear*

C *Red fox*

D *Vulpes vulpes*

3 The diagram shows an arthropod.



To which group does it belong?

A arachnids

B crustaceans

C insects

D myriapods

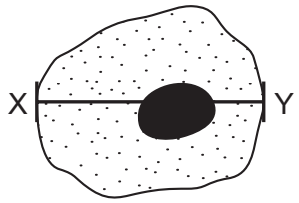
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4 Which features do animal cells share with plant cells?

	chloroplast	cytoplasm	nucleus
A	✓	✓	✓
B	✓	✗	✓
C	✗	✓	✓
D	✗	✗	✗

key
✓ = yes
✗ = no

5 The diagram shows a drawing of a human cheek cell.



The distance between points X and Y on the diagram is 30 mm.

The actual length of the cell between X and Y was 60 μm.

What is the magnification of the cell?

A ×50 **B** ×200 **C** ×500 **D** ×2000

6 Red blood cells were placed in pure water.

Movement of water across the cell membrane caused a change in their appearance.

What caused this change in appearance?

	direction of water movement	from higher to lower water potential	from lower to higher water potential
A	into cells	yes	no
B	into cells	no	yes
C	out of cells	yes	no
D	out of cells	no	yes

7 Which process depends on active transport?

A absorption of carbon dioxide by plant leaves

B reabsorption of glucose by kidney tubules

C removal of carbon dioxide in the alveoli

D uptake of water by plant roots

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8 Which identifies the chemical elements found in proteins?

	carbon	hydrogen	oxygen	nitrogen
A	✓	✓	✓	✓
B	✓	✓	✓	✗
C	✓	✗	✓	✗
D	✗	✓	✗	✓

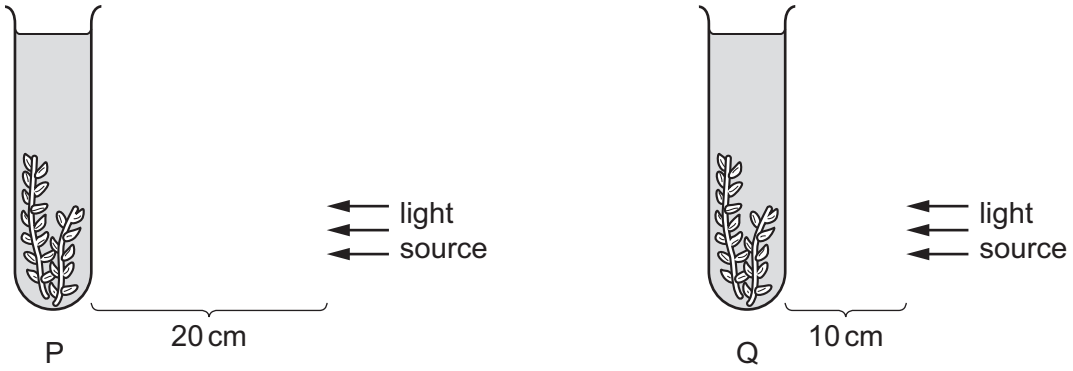
key
✓ = present
✗ = absent

9 A student carries out a test to see whether the solution in a test-tube contains protein.

Which row shows the correct food test and a positive result?

	name of test	colour seen with a positive result
A	Benedict's test	blue-black
B	Benedict's test	purple
C	biuret test	blue-black
D	biuret test	purple

10 The diagram shows an experiment investigating the effect of light intensity on an aquatic plant.



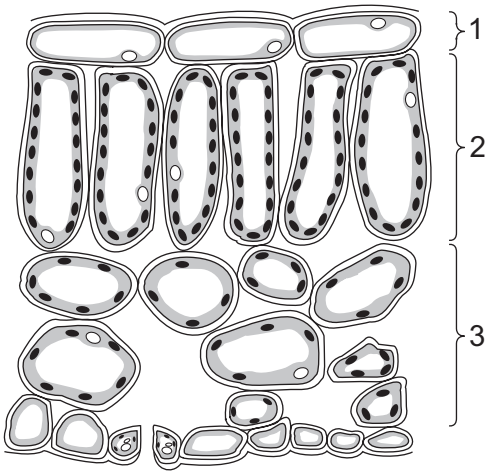
Photosynthesis occurred in both test-tube P and test-tube Q. Both test-tubes were kept at the same temperature. The number of bubbles produced in test-tube P was 12 bubbles per minute.

What is the most likely number of bubbles produced in one minute in test-tube Q?

A 0 **B** 3 **C** 12 **D** 48

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11 The diagram shows a leaf as seen in cross-section under the microscope.

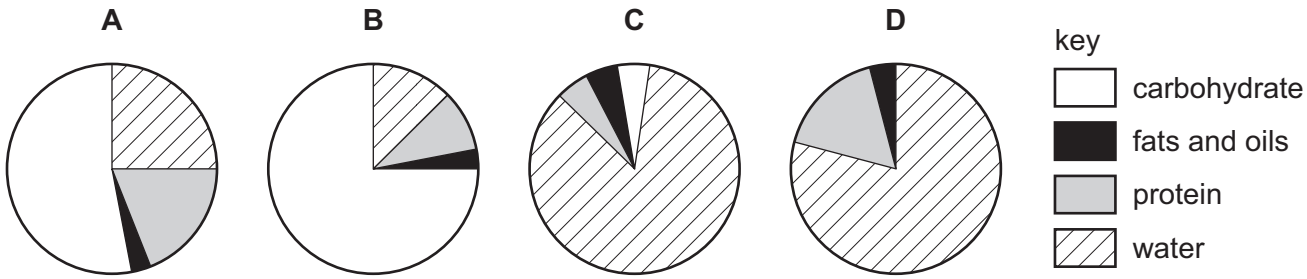


What are tissues 1, 2 and 3?

	1	2	3
A	epidermis	palisade mesophyll	spongy mesophyll
B	epidermis	spongy mesophyll	palisade mesophyll
C	palisade mesophyll	epidermis	spongy mesophyll
D	spongy mesophyll	palisade mesophyll	epidermis

12 The pie charts show the composition of 100 g of four different foods.

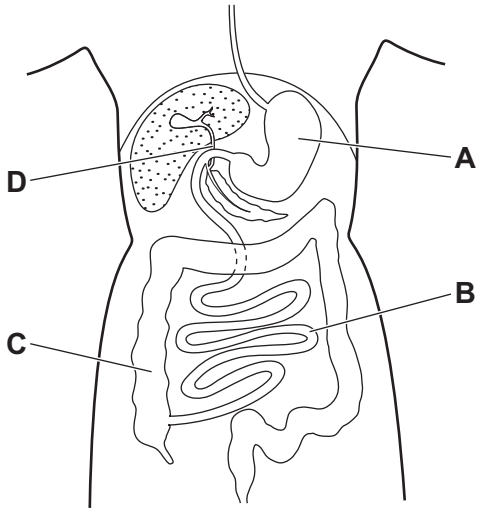
Which food provides the most energy?



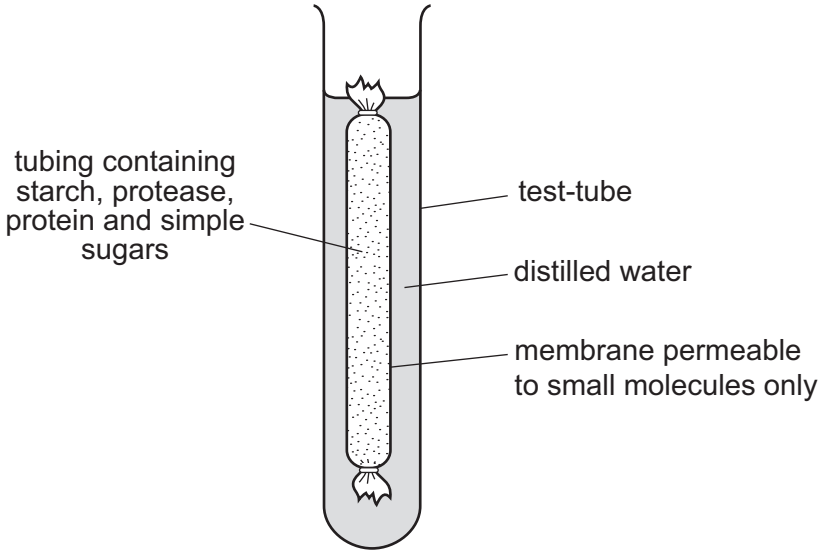
13 The cholera bacterium produces a toxin that results in water entering the alimentary canal and causing diarrhoea.

The diagram shows the human alimentary canal.

Into which region are chloride ions secreted as a result of the toxin?



14 The diagram shows an experiment kept at room temperature.



What is present in the water surrounding the membrane after 45 minutes?

A amino acids and simple sugars

B protein and amino acids

C protein and simple sugars

D starch and simple sugars

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15 The diagram shows an experiment to investigate transpiration.



Plant 1 is not covered. Plant 2 and its pot are covered by a transparent plastic bag.

The mass of each plant and its pot is measured. The masses are measured again after two hours.

What is the result?

A The mass of both plants decreases by the same percentage.

B The mass of both plants stays the same.

C The mass of plant 1 decreases more than the mass of plant 2.

D The mass of plant 2 decreases more than the mass of plant 1.

16 Which description of translocation is correct?

A movement of glucose and amino acids from a sink to a source

B movement of glucose and amino acids from a source to a sink

C movement of sucrose and amino acids from a sink to a source

D movement of sucrose and amino acids from a source to a sink

17 Which factor increases the risk of developing coronary heart disease?

A low fat diet

B regular exercise

C relaxation

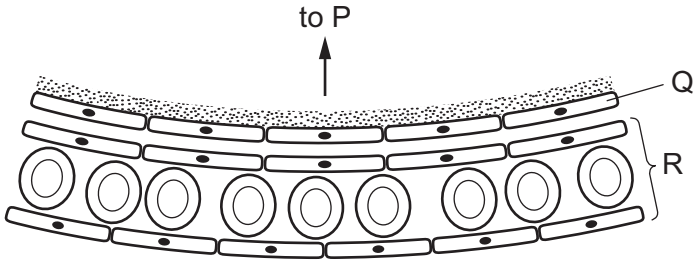
D smoking

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18 Which row describes the features of passive immunity?

	antibodies made	involves memory cells	effective period
A	no	no	short term
B	no	yes	short term
C	yes	no	long term
D	yes	yes	long term

19 The diagram shows part of the human gas exchange system.



Which row identifies P, Q and R?

	P	Q	R
A	alveolus wall	capillary wall	vein
B	bronchiole	alveolus wall	capillary
C	capillary	layer of moisture	bronchiole
D	alveolus wall	bronchiole	capillary

20 What is the effect on germinating seeds of increasing the temperature from 10 °C to 20 °C?

A a decrease in the production of oxygen

B a decrease in the respiration rate

C an increase in the respiration rate

D an increase in the transpiration rate

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21 Lactic acid builds up in the muscles during vigorous exercise.

During recovery, how is this lactic acid removed?

A aerobic respiration of lactic acid in the liver

B anaerobic respiration of lactic acid in the muscles

C excretion of lactic acid by the lungs

D removal of lactic acid by the alimentary canal

22 Which process transmits an impulse across a synapse?

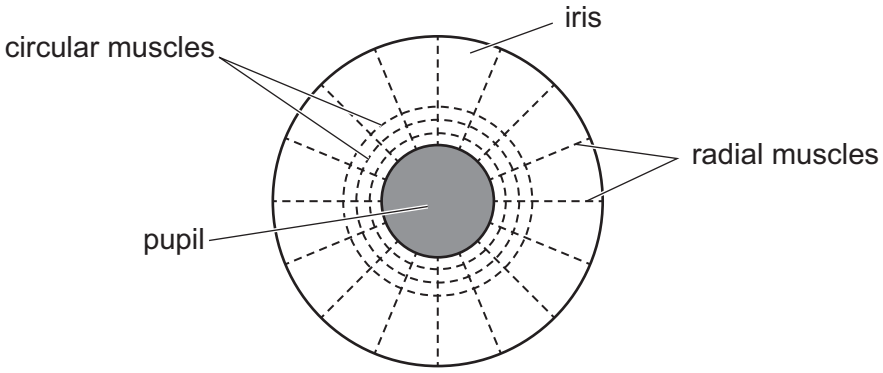
A active transport

B diffusion

C gravity

D osmosis

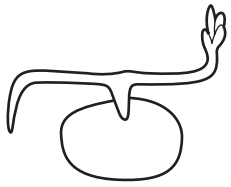
23 The diagram shows the muscles that control the size of the pupil in an eye.



How do the muscles make the pupil smaller?

	circular muscles	radial muscles
A	contract	contract
B	contract	relax
C	relax	contract
D	relax	relax

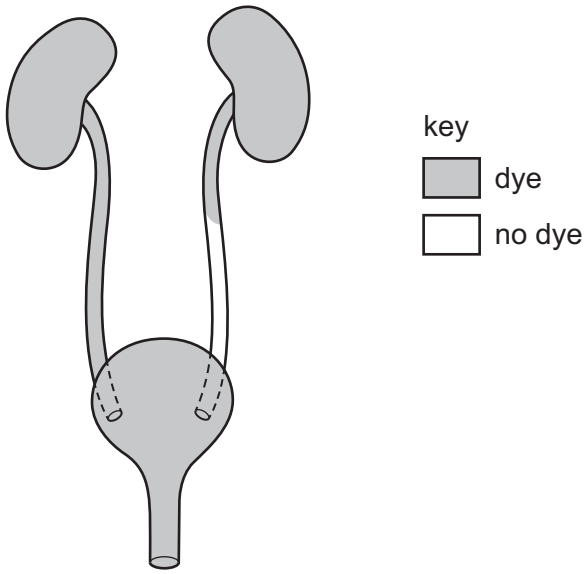
24 The diagram shows the shoot and root of a seedling responding to gravity.



Which row shows where the auxin accumulates and the effect of this in the shoot?

	accumulates	effect
A	lower surface	inhibits cell elongation
B	lower surface	promotes cell elongation
C	upper surface	inhibits cell division
D	upper surface	promotes cell division

25 A patient has dye injected into the blood supply to his kidneys. The dye appears in his excretory system as shown.



Which part is blocked?

A the kidney

B the ureter

C the bladder

D the urethra

26 Bacteria such as MRSA are resistant to antibiotics.

These processes can occur in bacteria.

1 artificial selection

2 genetic variation

3 mutation

4 natural selection

What would contribute to the development of antibiotic resistance?

A 1, 2, 3 and 4

B 1, 2 and 3 only

C 2, 3 and 4 only

D 2 and 4 only

27 Why do some athletes take anabolic steroids?

A to decrease blood glucose concentration

B to increase muscle mass

C to kill bacteria

D to reduce aggression

28 In humans, why are sperm cells produced in much greater numbers than egg cells?

A Many sperm cells are needed to fertilise an egg cell.

B Sperm cells are small in size.

C Sperm cells are non-motile.

D The chance of one sperm cell reaching an egg is very small.

29 There are many reasons why a woman does not become pregnant.

What can be treated by a drug that increases the secretion of FSH?

A inactive sperm

B follicles not developing

C thin uterine lining

D too few sperm

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30 The diagram shows the cells of a mammalian embryo shortly after fertilisation.



Which is the correct description of these cells?

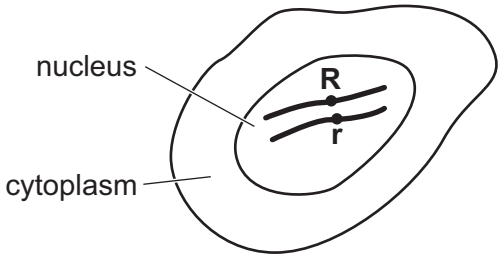
A gametes undergoing meiosis

B gametes undergoing mitosis

C stem cells undergoing meiosis

D stem cells undergoing mitosis

31 The diagram shows a diploid cell and alleles **R** and **r** on one pair of chromosomes.



When this cell divides by mitosis, which daughter cells will be produced?

	chromosome number	genotype
A	diploid	heterozygous
B	diploid	homozygous
C	haploid	heterozygous
D	haploid	homozygous

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32 The diagram shows a genetic cross between a male bird with black feathers and a female bird with white feathers. All of the offspring have blue feathers.

parents F^BF^B (black) × F^WF^W (white)

offspring F^BF^W 100% blue

Two of the blue offspring are crossed.

Which row shows the correct phenotype percentages for the cross?

	percentage black	percentage blue	percentage white
A	25	75	0
B	25	50	25
C	50	20	25
D	75	0	25

33 What is a feature of some xerophytes?

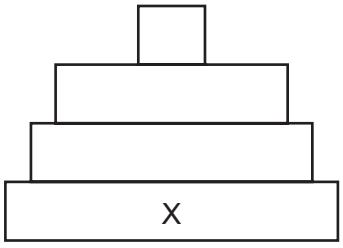
A large air spaces in the tissues

B leaves rolled up and covered with hairs

C leaves with stomata on the upper surface

D thin cuticle

34 The diagram shows a pyramid of biomass.



Which organisms are found in position X?

A decomposers

B herbivores

C primary consumers

D producers

35 What is a trophic level?

A a group of interconnected food chains

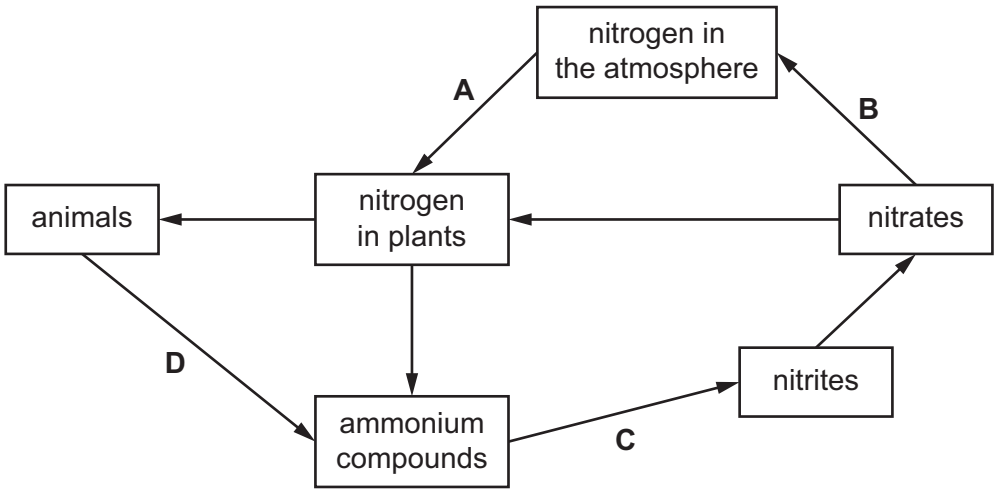
B all of the consumers in an ecosystem

C an organism's position in a food web

D the transfer of energy between organisms

36 The diagram shows part of the nitrogen cycle.

At which stage is denitrification occurring?



37 Which structures found in bacteria make bacteria useful in genetic engineering?

A cell walls

B membranes

C nuclei

D plasmids

38 Which chemical reaction is catalysed by maltase?

A glycogen → glucose + maltose

B maltose → glucose + glucose

C maltose → starch

D starch → glucose + maltose

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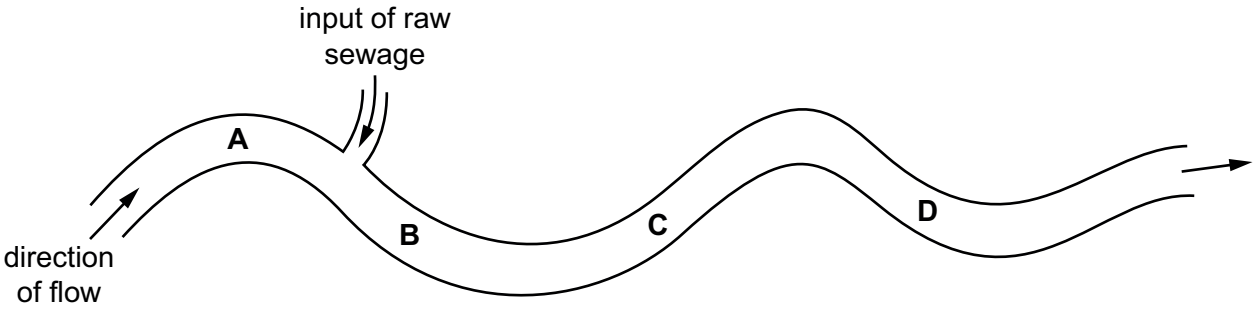
39 What are the possible effects of deforestation?

	loss of soil	flooding	decrease in atmospheric carbon dioxide
A	yes	yes	no
B	yes	no	yes
C	no	yes	no
D	no	no	yes

40 The bloodworm is an organism that is found in heavily polluted water.

The diagram shows where raw sewage flows into a river.

Where would there be fewest bloodworms?



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