



# EXAMINATIONS COUNCIL OF ZAMBIA

Examination for School Certificate Ordinary Level

## Biology Paper 1 Multiple Choice

5090/1

Wednesday

13 NOVEMBER 2019

**Additional Materials:**

- Multiple Choice answer sheet
- Soft clean eraser
- Soft pencil (type B or HB is recommended)

**Time: 50 minutes**

### Instructions to Candidates

Look at the left hand side of your Answer card. Ensure that your **name**, the **school/centre name** and **subject paper** are printed. Also ensure that the **subject code**, **paper number**, **centre code**, **your examination number** and the **year** are printed and shaded. Do not change the already printed information.

There are **forty (40)** questions in 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 Answer Card provided.

Read very carefully the instructions on the answer sheet.

### Information for Candidates

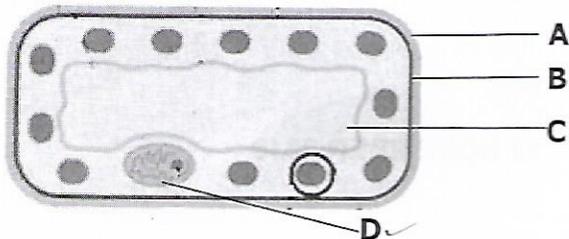
Each correct answer will score one mark.

Any rough working should be done in this Question Paper.

**Cell phones are not allowed in the examination room.**

gidemy.com

- 1 Which of the following is a list of characteristics common to all living organisms?
  - A Breathing, excretion, reproduction
  - B ✓** Growth, irritability, reproduction
  - C Hearing, respiration, excretion
  - D Reproduction, excretion, sight
- 2 The diagram shows a palisade cell of a leaf.



Which labelled part is selectively permeable?

- 3 In an osmosis experiment, four strips of potatoes each 5cm long, were left in salt solutions of different concentration. The table below shows the lengths of the strips after one hour.

Salt solution	Length of strips after 60 minutes
A	4.5cm
B	4.8cm
C	5.0cm
<b>D ✓</b>	5.3cm

Which of the salt solutions **A**, **B**, **C** or **D** above was the least concentrated?

- 4 What are enzymes made of?

- A Carbohydrates
- B DNA
- C Fats
- D ✓** Proteins

- 5 A sample of food mixed with water was tested to find out its contents. The results are shown in the table below.

Test	Result
Iodine solution added	Yellow colour
Benedict's solution added and mixture heated	Brick-red precipitate
Shaken with ethanol	White emulsion
Biuret reagent added	Blue colour

Which nutrients were present in the food sample?

- A Fat and reducing sugar
- B Fat and starch
- C Protein only
- D ✓ Reducing sugar only

6 Poor nutrition can lead to a condition called Rickets in which bones fail to develop properly. Which food would be best to prevent the occurrence of rickets in growing children?

Food	Calcium	Iron	Vitamin C	Vitamin D
A	✓	×	✓	×
B	✓	×	×	✓
C ✓	×	✓	✓	×
D	×	✓	×	✓

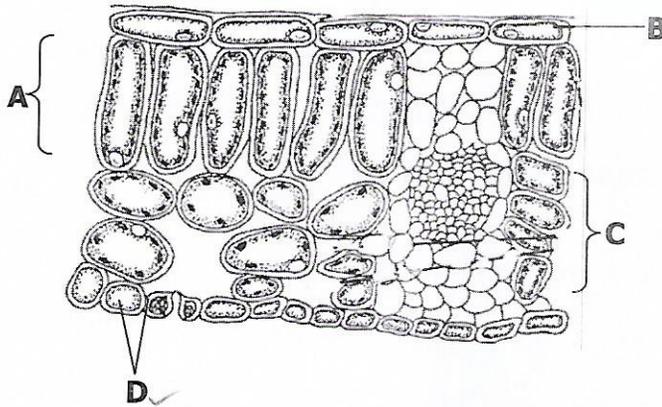
**Key**

✓ = nutrient present  
 × = nutrient absent

7 Which of the following plant nutrients is used for making chlorophyll?

- A ✓ Boron
- B Calcium
- C Magnesium
- D Potassium

8 The diagram shows the internal structure of a leaf.



In which part A, B, C or D above would the most photosynthesis occur on a sunny day?

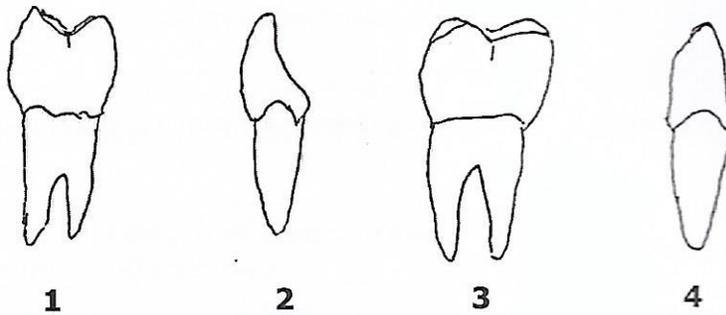
9 The following statements describe stages in saprophytic nutrition in Rhizopus.

- 1 Rhizopus secrete enzymes
- 2 Rhizopus grow into substrate
- 3 Enzymes digest food nutrients
- 4 Small molecules are absorbed and passed into mycelium
- 5 Small soluble molecules are produced

Which of the following shows the correct sequence of the stages?

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

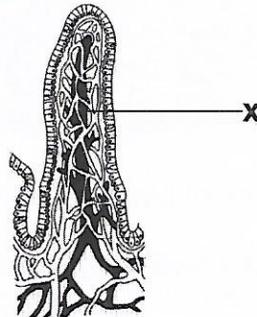
10 The diagram below shows types of teeth in a human being.



Which of the above types of teeth are used for grinding?

- A ✓ 1 and 3
- B 1 and 4
- C 2 and 3
- D 2 and 4

11 The diagram shows the structure of a villus.



Which substance is absorbed into the part labelled X?

- A Amino acids
- B Fatty acids and glycerol
- C ✓ Fructose
- D Glucose

- 12 Which of the following correctly identifies features present in gaseous exchange surfaces?

	Large surface area	Moist	Thick walls
A	✓	✓	×
B ✓	✓	×	✓
C	×	✓	✓
D	✓	✓	✓

**Key**

✓ = present  
 × = absent

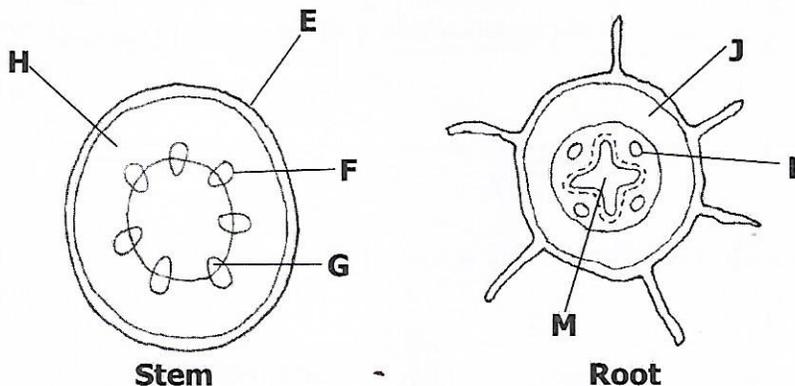
- 13 Which of the following correctly shows the difference between aerobic and anaerobic respiration in animals?

	Aerobic respiration	Anaerobic Respiration
A	Releases less energy	Releases more energy
B ✓	Uses oxygen	Uses carbon dioxide
C	Produces lactic acid	Produces alcohol
D	Produces carbon dioxide and water	Produces lactic acid

- 14 Which of the following is **not** a cause of stigma to people living with HIV and AIDS?

- A ✓ Fear of death
- B Lack of support groups
- C Myth about origin of HIV and AIDS
- D Sensitisation of community

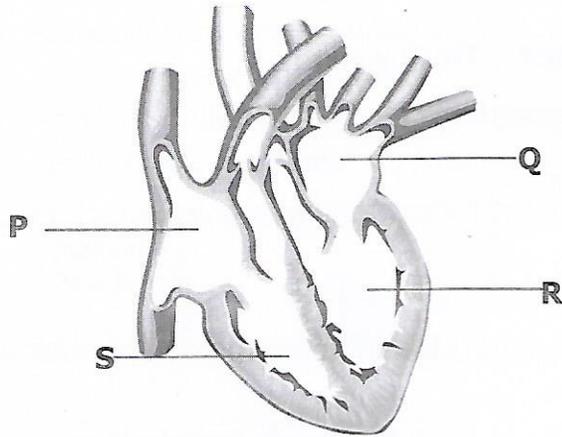
- 15 The diagram shows sections through the stem and root of a dicotyledonous plant.



Which labelled structures conduct water and mineral salts through the stem and root?

- A E and J
- B ✓ F and M
- C G and M
- D H and L

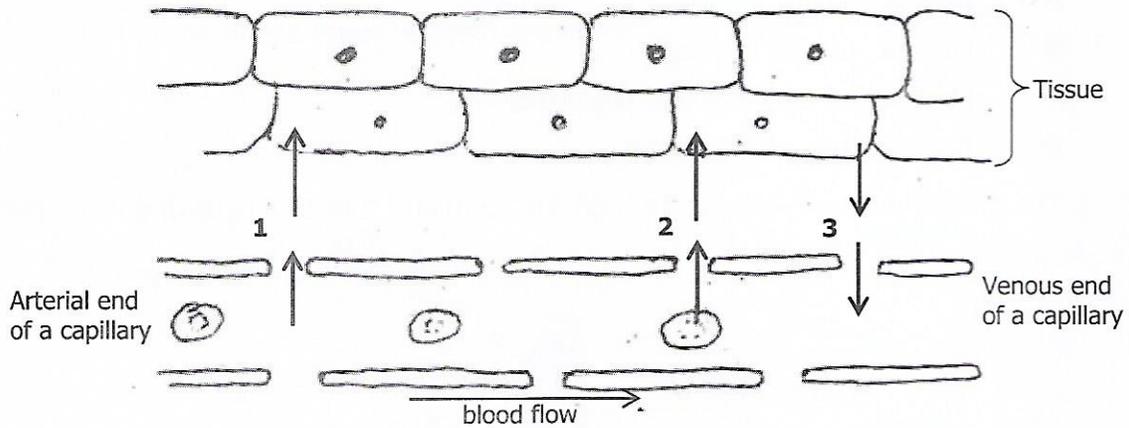
16 The diagram shows the longitudinal section of the heart.



Which two chambers contract at the same time?

- A P and Q
- B P and S
- C ✓ Q and S
- D Q and R

17 The diagram represents a tissue with an adjacent capillary.



What substances are represented by arrows 1, 2 and 3?

	1	2	3
A	Glucose	Oxygen	Carbon dioxide
B	Glucose	Tissue fluid	Carbon dioxide
C ✓	Oxygen	Carbon dioxide	Tissue fluid
D	Tissue fluid	Glucose	Oxygen

- 18 Which of the following correctly identifies substances dissolved in the urine of a healthy person?

	Glucose	Protein	Salts	Urea
A	×	×	×	✓
B	×	×	✓	✓
C ✓	✓	×	✓	✓
D	✓	✓	×	×

**KEY**

✓ = present

×

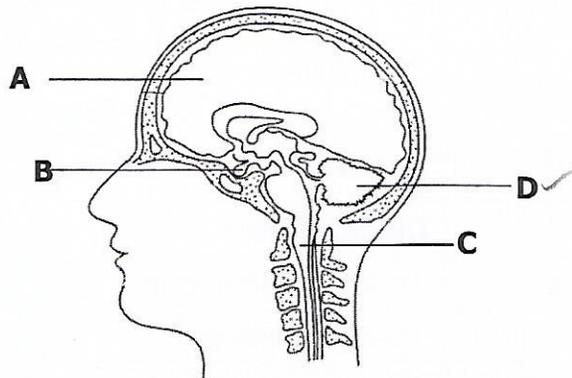
- 19 During a long distance race, the body temperature of an athlete begins to rise. Which changes occur to help return the body temperature to normal?

	Sweating	Blood vessel in the skin
A	Decreases	Constrict
B	Decreases	Dilate
C ✓	Increases	Constrict
D	Increases	Dilate

- 20 What is the effect of insulin in the human body?

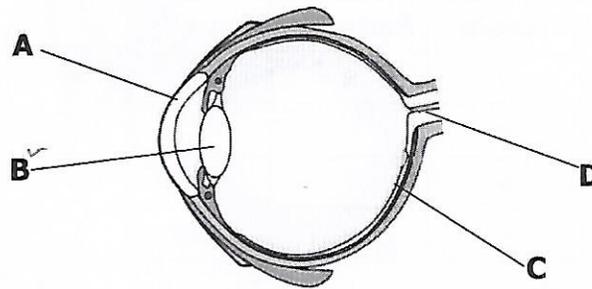
- A It decreases cell respiration.
- B It decreases absorption of glucose by cells.
- C It increases excretion of glucose.
- D ✓ It increases synthesis of glycogen.

- 21 The diagram shows a section of the human brain.



Which part controls breathing rate and regulates blood pressure?

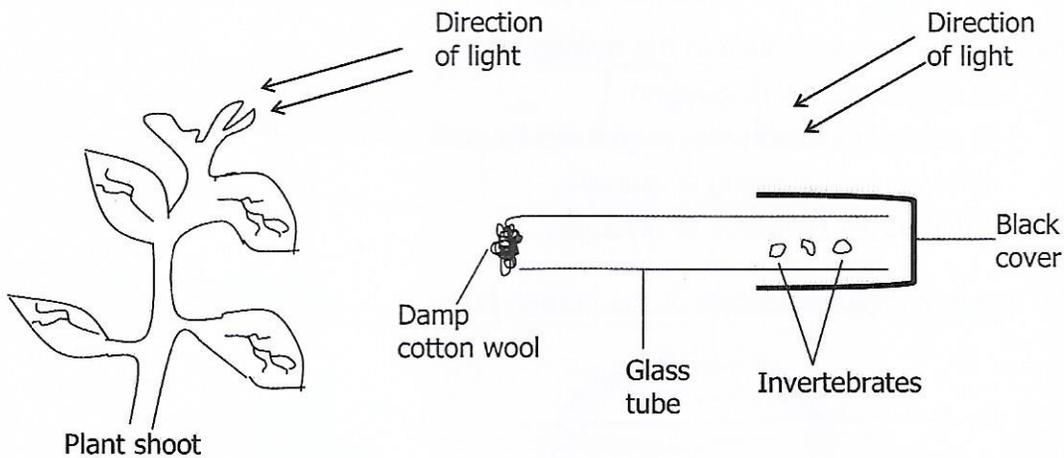
- 22 The diagram shows a section through a human eye. Which labelled structure contains cells that are sensitive to light?



- 23 Which part of the skeleton of an insect is made of living cells?

- A ✓ Cuticle
- B Epicuticle
- C Epidermis
- D Procuticle

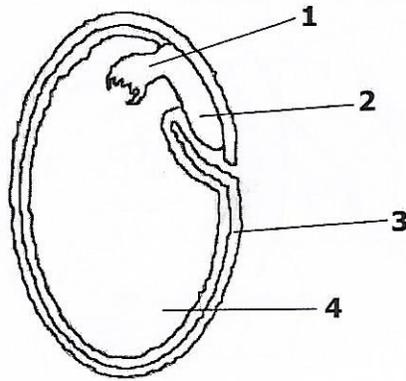
- 24 The diagram shows a plant shoot and small invertebrates responding to a stimulus.



Which responses are shown by these organisms?

	Plant shoot	Invertebrates
A	Negative photo taxis	Positive phototropism
B	Negative phototropism	Positive photo taxis
C ✓	Positive photo taxis	Negative phototropism
D	Positive phototropism	Negative photo taxis

- 25 The diagram shows the structure of a bean seed.



Which of the labelled parts make up the embryo?

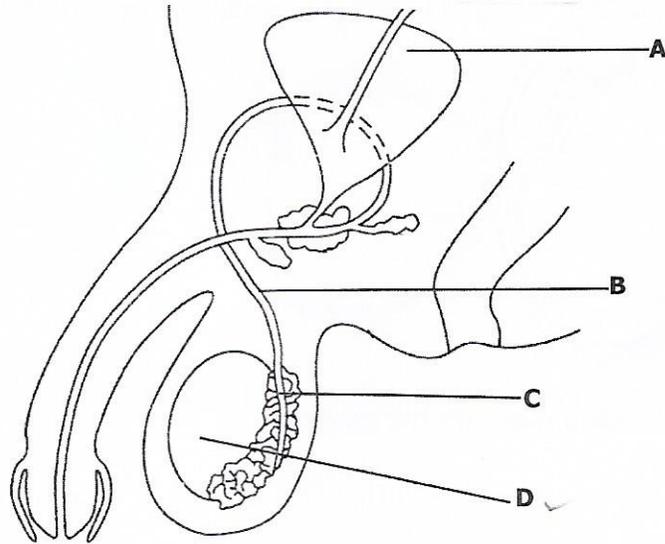
- A** ✓ 1 and 2  
**B** 1 and 3  
**C** 2 and 3  
**D** 3 and 4
- 26 Which of the following factors are necessary for germination to occur?
- A** Carbon dioxide, oxygen and suitable temperature  
**B** Chlorophyll, light and mineral salts  
**C** ✓ Oxygen, suitable temperature and water  
**D** Soil particles, mineral salts and oxygen
- 27 The following processes occur during reproduction in a plant.
- 1 The male nucleus fuses with the female nucleus.
  - 2 The male nucleus is released from the pollen tube.
  - 3 The male nucleus travels down the pollen tube.
  - 4 The pollen grain grows a pollen tube.

In which order do these processes occur?

- |            | First | —————→ | Last |
|------------|-------|--------|------|
| <b>A</b>   | 3     | 4      | 1 2  |
| <b>B</b>   | 3     | 4      | 2 1  |
| <b>C</b>   | 4     | 3      | 1 2  |
| <b>D</b> ✓ | 4     | 3      | 2 1  |

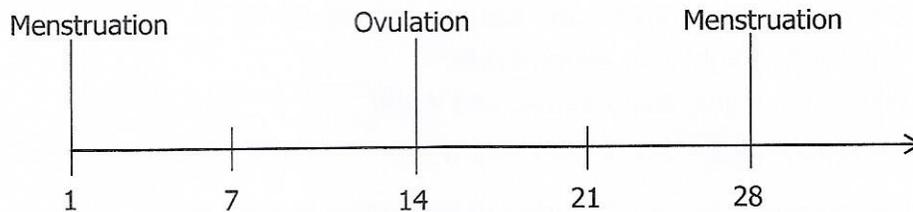
- 28 Which of the following represents the correct order in a frog's life cycle?
- A** Eggs, tadpole, froglet, frog  
**B** Eggs, froglet, tadpole, frog  
**C** ✓ Froglet, eggs, frog, tadpole  
**D** Froglet, tadpole, frog, eggs

29 The diagram shows the male reproductive and urinary systems.



Which structure produces the hormone testosterone?

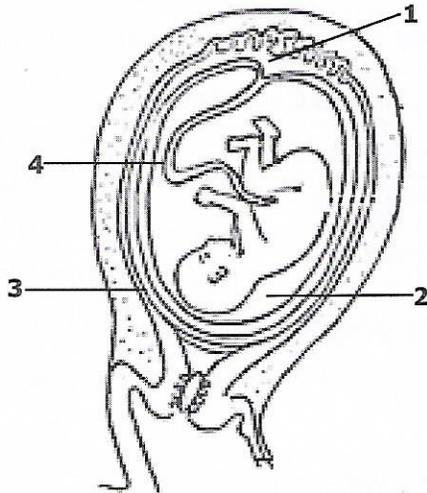
30 The diagram shows a 28 day menstrual cycle in a woman.



During which days would the woman be most fertile and least fertile?

	Most fertile	Least fertile
A	1 – 7	14 – 21
B ✓	7 – 14	21 – 28
C	14 – 21	1 – 7
D	21 – 28	7 – 14

- 31 The diagram shows a foetus in the uterus.



Which statement is true? The part labelled ...

- A 1 prevents nicotine and alcohol from diffusing to the foetus.
  - B 2 spreads pressure evenly around the foetus.
  - C 3 provides oxygen and nutrients for the foetus.
  - D 4 holds the foetus in place in the uterus.
- 32 The table below shows the average pregnancy rates among couples using different methods of birth control.

Birth control method	Average number of pregnancies per 1000 couples per year
Condom	55
Contraceptive pill	4
Rhythm method	125
Spermicide	80

Which type of birth control is the least reliable?

- A Chemical
- B Hormonal
- C Mechanical
- D Natural

- 33 A couple has three children. The table shows some of the characteristics of their children.

Child	Sex	Blood group	Sickle Cell/Normal
1	Male	B	Sickle cell
2	Female	AB	Normal
3	Male	O	Normal

What type(s) of variation do these characteristics show?

- A Continuous variation only  
 B Discontinuous variation only  
 C Both continuous and discontinuous variation  
 D Neither continuous nor discontinuous variation
- 34 In a certain plant, the allele for white fruit, **B**, is dominant over the allele for yellow fruit, **b**. A white-fruited plant was crossed with a yellow-fruited plant. About half of the offspring were white-fruited and the other half were yellow-fruited. Which genotypes did the parent plants have?
- A bb and bb  
 B Bb and bb  
 C BB and bb  
 D BB and Bb
- 35 Sex in humans is determined by X and Y chromosomes inherited from parents. Which of the following shows the correct chromosome inherited from the father and from the mother?

	Sex of child	Chromosome from father	Chromosome from mother
A	Male	X	Y
B	Male	Y	X
C	Female	X	Y
D	Female	Y	X

- 36 The table shows the number of animals collected in a sample from some woodland and the classes to which they belong.

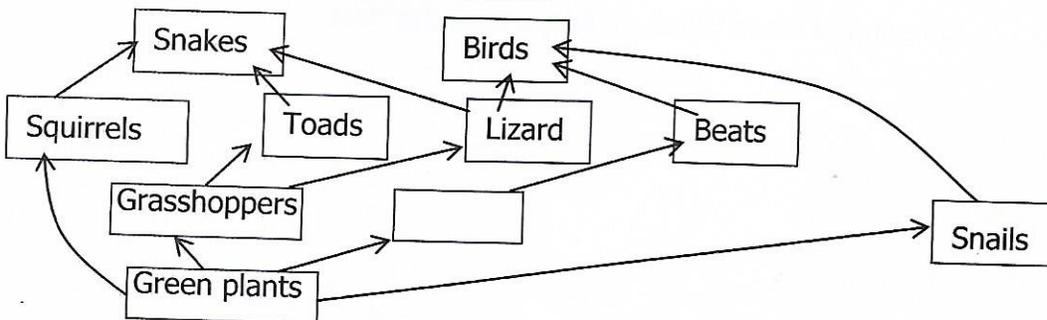
Animal class	Number in sample
Annelida	8
Arachnida	10
Insecta	80
Mollusca	40
Mynicipoda	7
Nematoda	15

How many arthropods were collected?

- A 33  
 B 97  
 C 120  
 D 160
- 37 A 200g sample of fresh soil was heated at the boiling point of water until a constant soil mass of 140g was reached. Then the soil was further heated strongly (roasted) until a second constant mass of 100g was reached. What was the percentage of water and humus in the fresh soil sample?

	% humus	% water
A	10	20
B	20	30
C	30	50
D	50	70

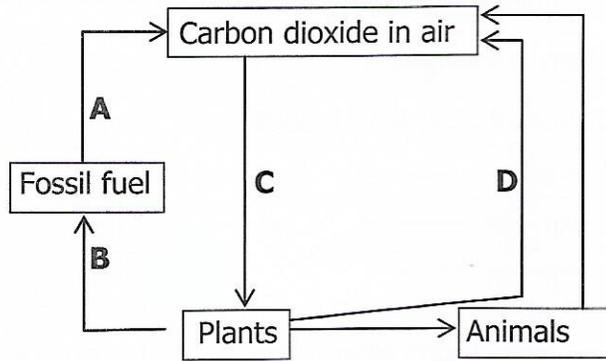
- 38 The diagram below shows a food web.



Which organisms would increase in number if the number of snakes increases?

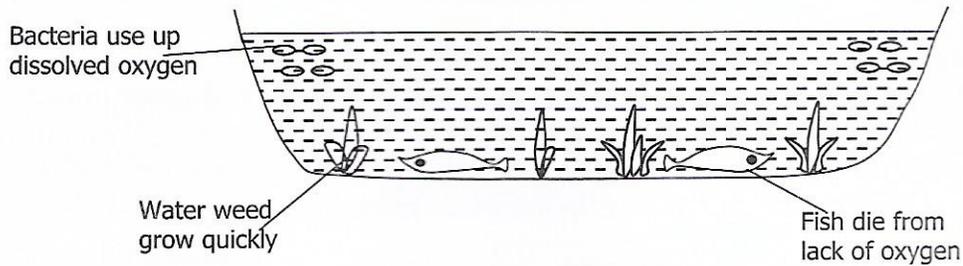
- A Birds  
 B Grasshoppers  
 C Lizards  
 D Squirrels

39 The diagram shows part of the carbon cycle.



Which letter represents photosynthesis?

40 The diagram shows some of the effects of human activity on a river.



Which human activity would have caused these effects?

- A Cutting down of trees near rivers.
- B Discharge of raw sewage into river.
- C Releasing of sulphur dioxide to the air from a nearby factory.
- D Spraying of weed killers on farms near the river.