

**EXAMINATIONS COUNCIL OF ZAMBIA**

Joint Examination for the School Certificate  
and General Certificate of Education Ordinary Level

**BIOLOGY**

**5090/1**

PAPER 1 Multiple Choice

Monday

7 NOVEMBER 2011

50 Minutes

Additional materials:

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

**TIME:** 50 Minutes

**INSTRUCTIONS TO CANDIDATES**

**Do not open this Question Paper until you are told to do so.**

Write your name, centre number and candidate number on the Answer Sheet in the spaces provided unless this has already been done for you.

There are **forty** 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 separate Answer Sheet.

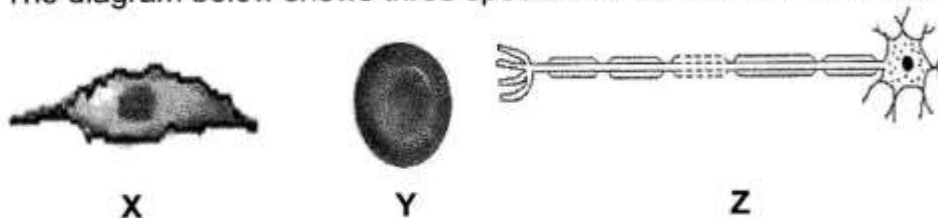
**Read very carefully the instructions on the Answer Sheet.**

**FORMATION FOR CANDIDATES**

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 Question Paper.

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

1 The diagram below shows three specialized cells found in a human being.



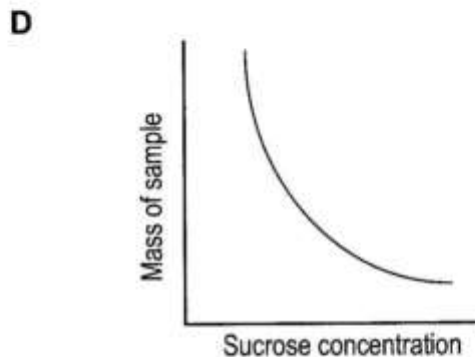
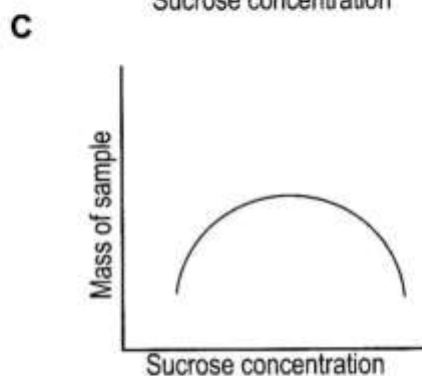
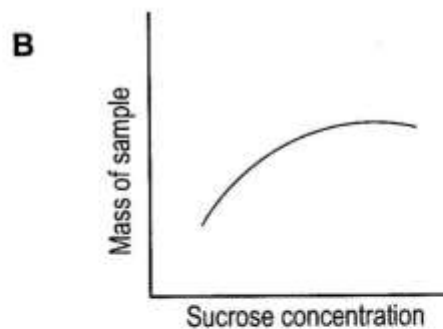
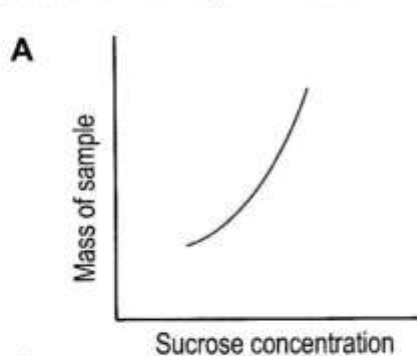
Match the three cells with the tissues where they are found.

	Cell X	Cell Y	Cell Z
A	Blood	Nerve	Muscle
B	Muscle	Blood	Nerve
C	Nerve	Muscle	Blood
D	Muscle	Nerve	Blood

2 What structures help root hair cells to take up water?

- A Contractile fibres
- B Thick outer wall
- C Large surface area
- D Cell membrane

3 Samples of potato tuber were placed in sucrose solutions of different concentrations. Any changes in the mass of samples were noted. Select the graph that shows the results of the experiment.

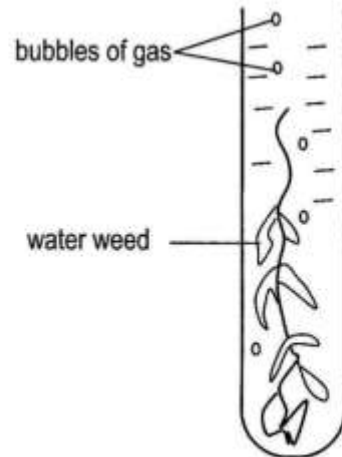


- 4 Four test tubes were filled with pond water and prepared as shown in the table below.

A	B	C	D
Tube A	Tube B	Tube C	Tube D
Pond weed	Pond weed	Pond weed	Pond weed
	Water snail		Tube enclosed in aluminium foil
25°C	25°C	10°C	25°C

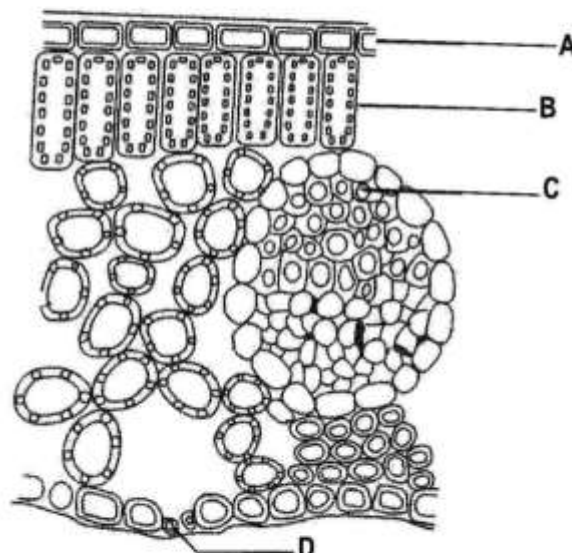
Choose the tube that would have the largest amount of oxygen.

- 5 The figure below shows an experiment to investigate photosynthesis.



Under what conditions would the plant produce most bubbles?

- |   | Dissolved Carbon dioxide | Light  | Temperature |
|---|--------------------------|--------|-------------|
| A | Present                  | Bright | Warm        |
| B | Present                  | Bright | Cool        |
| C | Absent                   | Dim    | Warm        |
| D | Absent                   | Bright | Cool        |
- 6 Diagram below shows the internal structure of a dicotyledonous leaf.  
Which labelled part plays a role in conducting of mineral salts and water to the leaf?



7 The table below shows the results of experiments in which mixtures shown in the table were tested with

- (i) Benedict's solution,
- (ii) Iodine solution.

Each mixture was made, then kept at room temperature for ten minutes before testing.

	Mixture	Colour of mixture after testing with Benedict's solution	Colour of mixture after testing with Iodine solution
X	Saliva + water	Blue	Brown
Y	Starch + water	Blue	Black
Z	Saliva + starch + water		

What would be the result for mixture Z?

	Colour of mixture after testing with Benedict's solution	Colour of mixture after testing with Iodine solution
A	Blue	Black
B	Blue	Brown
C	Red	Black
D	Red	Brown

8 An analysis of the contents of a food container is shown below.

Protein	11.0%
Carbohydrates	62.4%
Fat	7.0%
Minerals and vitamins	19.6%

Which of these includes any sugar which may be present?

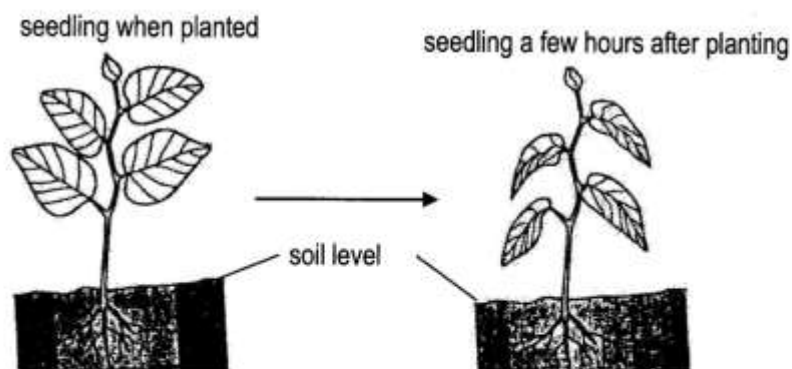
- A Protein
- B Carbohydrate
- C Fat
- D Minerals and Vitamins

- 9 The following diagram shows the skull of a goat.



What is the dental formula of the goat?

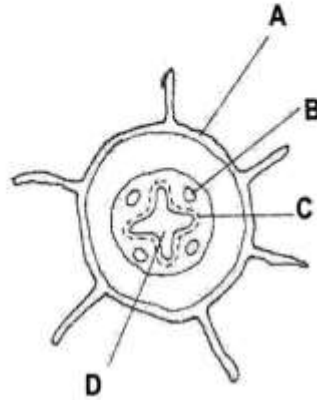
- A  $i \frac{3}{3}, c \frac{1}{1}, Pm \frac{3}{2}, m \frac{1}{1}$
- B  $i \frac{0}{3}, c \frac{0}{1}, Pm \frac{3}{3}, m \frac{3}{3}$
- C  $i \frac{1}{1}, c \frac{0}{0}, Pm \frac{0}{0}, m \frac{3}{3}$
- D  $i \frac{2}{2}, c \frac{1}{1}, Pm \frac{2}{2}, m \frac{3}{3}$
- 10 The diagram below shows how a seedling changes appearance a few hours after planting.



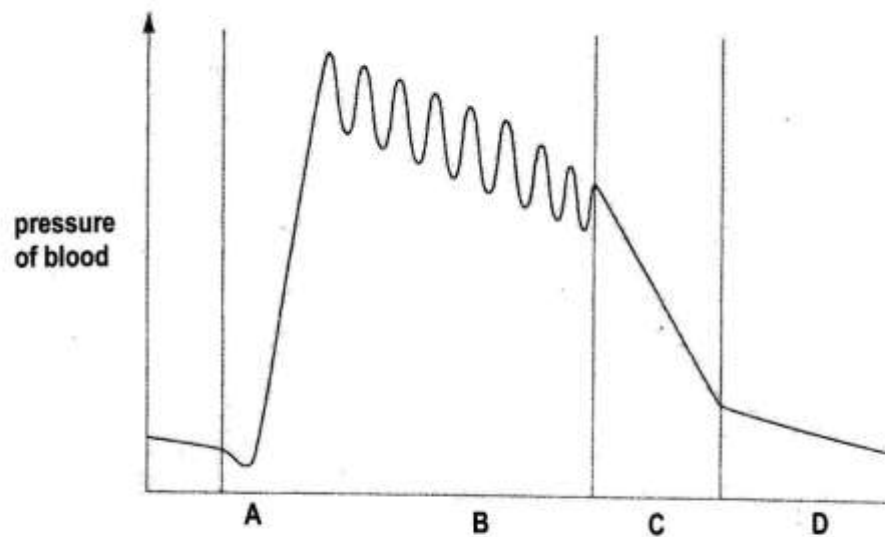
Identify the environmental conditions which will contribute to the change above.

	Light intensity	Humidity	Temperature
A	Low	Low	Low
B	Low	High	High
C	High	Low	High
D	High	High	Low

- 11 The diagram below shows the transverse section of a dicotyledonous root. Which of the labelled tissues contain meristematic cells?



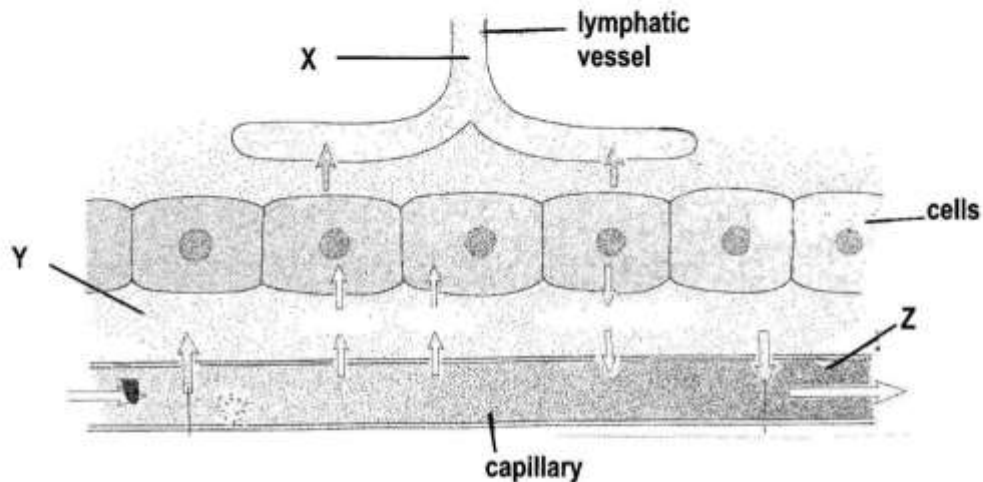
- 12 The graph below shows the pressure of the blood as it completes one systematic circulation.



Which labelled section of the graph shows the pressure of blood as it passes through capillaries?

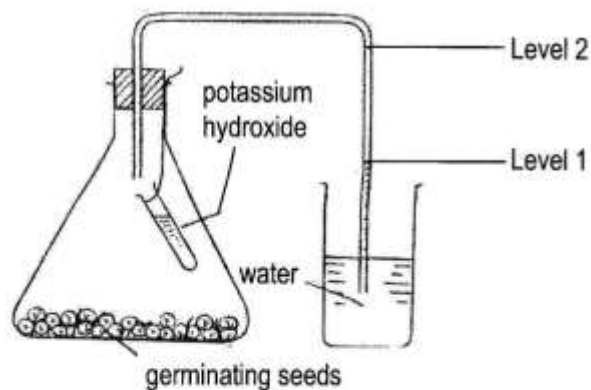
- 13 Blood group **AB** can receive blood from ...
- A **O** only.
  - B **AB** and **O**.
  - C **A** and **B**.
  - D **A**, **B**, **AB** and **O**.

- 14 The diagram below shows a capillary bed.



What are the names of the fluids found at X, Y and Z?

- |   | X      | Y            | Z            |
|---|--------|--------------|--------------|
| A | Plasma | Lymph        | Tissue Fluid |
| B | Plasma | Tissue Fluid | Lymph        |
| C | Lymph  | Plasma       | Tissue Fluid |
| D | Lymph  | Tissue Fluid | Blood        |
- 15 The diagram below shows the setup of apparatus to demonstrate respiration in germinating seeds.



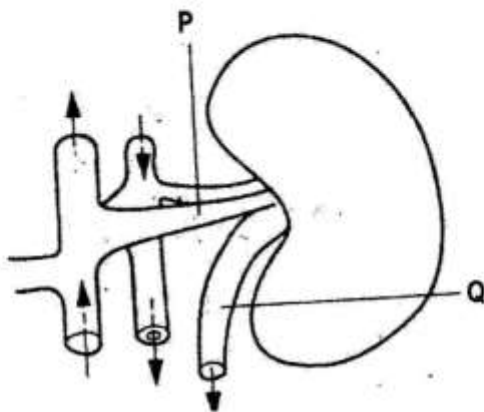
What causes the level of water to rise from **level 1** to **level 2** in the glass tube after six hours of experiment?

- A Production of carbon dioxide by germinating seeds.  
 B Absorption of oxygen by germinating seeds.  
 C Absorption of carbon dioxide by germinating seeds.  
 D Increased pressure inside the conical flask.

- 16 Which of the following best explains why insects survive without any oxygen carrying pigment in their blood?
- A The body is small and sufficient oxygen can diffuse through the surfaces.
  - B Sufficient oxygen is carried dissolved in the plasma.
  - C The tracheoles conduct oxygen directly to the tissues.
  - D Oxygen is absorbed directly into the tissues at the spiracles.

- 17 During which stage of the life cycle of a housefly does meiosis take place?
- A Adult
  - B Pupa
  - C Larva
  - D Egg

- 18 The diagram below shows the kidney and associated structures while the table lists the percentages of certain components found within structures P and Q.

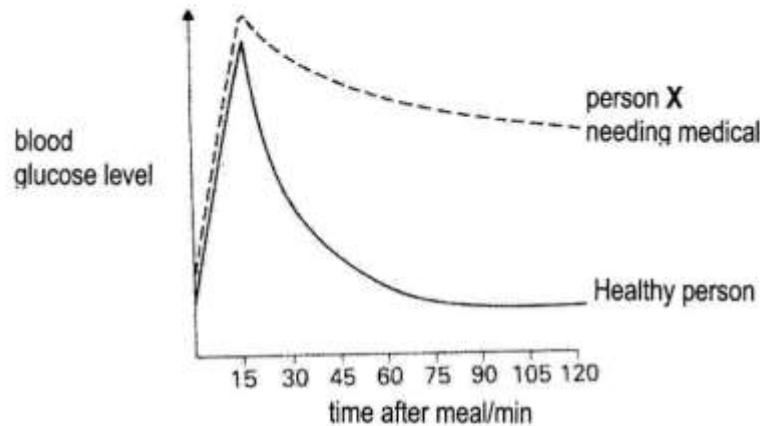


	Concentration in structure P%	Concentration in structure Q%
Urea	0.03	2.00
Glucose	0.10	0.00
Amino acids	0.05	0.00
Salts	0.72	1.50
Proteins	8.00	0.00

Deduce the functions of the kidney based on information given in the table.

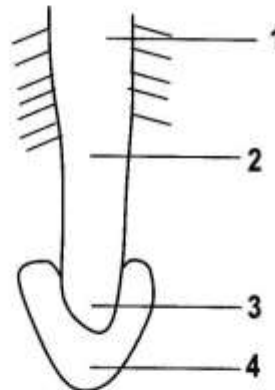
- A Removal of excess glucose from the blood.
  - B Removal of urea and salts from the blood.
  - C Removal of excess amino acids from the blood.
  - D Removal of excess proteins from the blood.
- 19 Which of the following is **not** an excretory waste in plants?
- A Resins
  - B Sugars
  - C Oils
  - D Proteins

- 20 The graph shows changes in the blood sugar levels of two people after eating identical meals.



The correct medical treatment for person X would be ...

- A blood transfusion.
  - B insulin injection.
  - C extra vitamin in the diet.
  - D dialysis by a kidney machine.
- 21 The diagram below shows a longitudinal section of the root tip of a flowering plant.



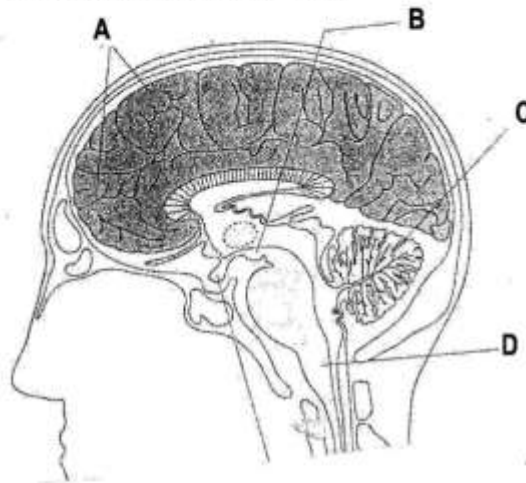
Which of the regions marked 1 – 4 is the region for maximum growth, differentiation and cell division?

	Maximum growth	differentiation	Cell division
A	1	2	4
B	3	4	2
C	2	1	3
D	4	3	2

- 22 Which one of the following causes loss of hearing due to prolonged listening to loud sounds?

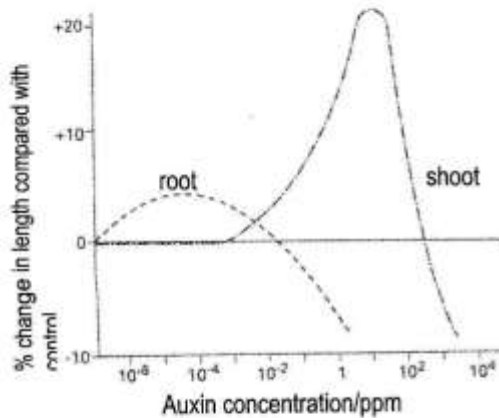
- A Wearing out of the ossicles
- B Blockages of auditory canal
- C Stiffening of the hair cells
- D Stiffening of the ear drum

23 The diagram shows a section of the human brain.



Choose the letter that represents the medulla oblongata.

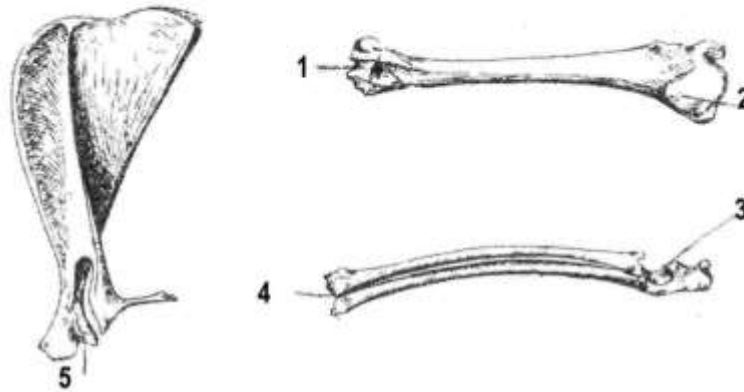
24 The graph shows the response of bean seedlings to various concentrations of externally applied Auxin.



Which of the following is the best conclusion to be drawn from the graph?

- A Low concentrations of auxins reduces growth in both shoots and roots.
  - B Low concentrations of auxins increases growth in shoots but reduces growth in roots.
  - C High concentrations of auxins increase growth in shoots but reduce growth in roots.
  - D High concentrations of auxins increases growth in both shoots and roots.
- 25 The Skeletal System found in insects is the ...
- A endoskeleton.
  - B exoskeleton.
  - C hydrostatic.
  - D eposkeleton.

26 The diagrams show bones of the fore arm.

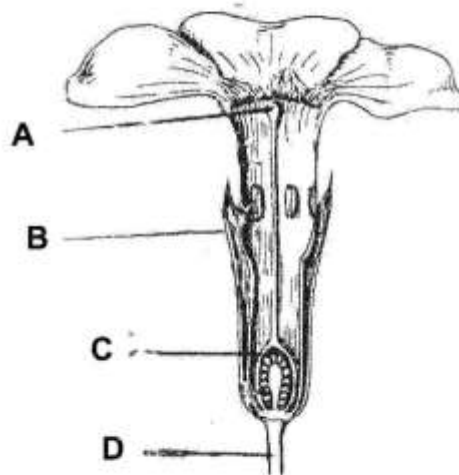


Between what points can a hinge joint form?

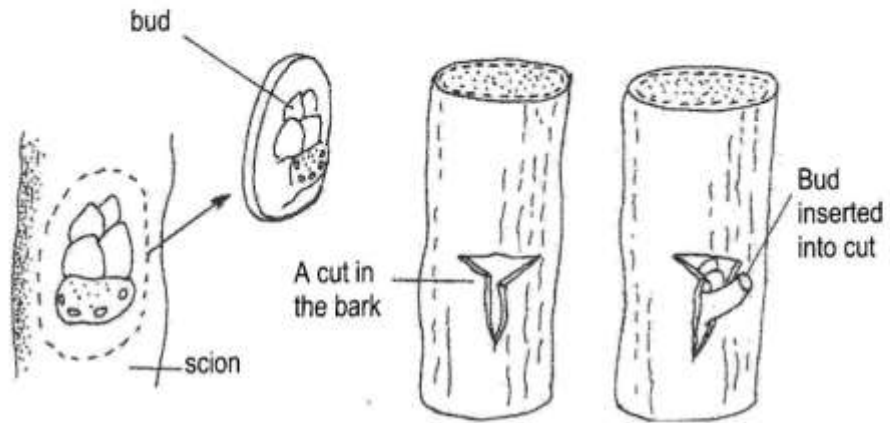
- A 1 and 3
- B 1 and 4
- C 2 and 3
- D 2 and 5

27 The diagram shows a longitudinal section of a primrose flower.

Which of the parts labelled **A**, **B**, **C** or **D** shows that the flower is insect-pollinated?



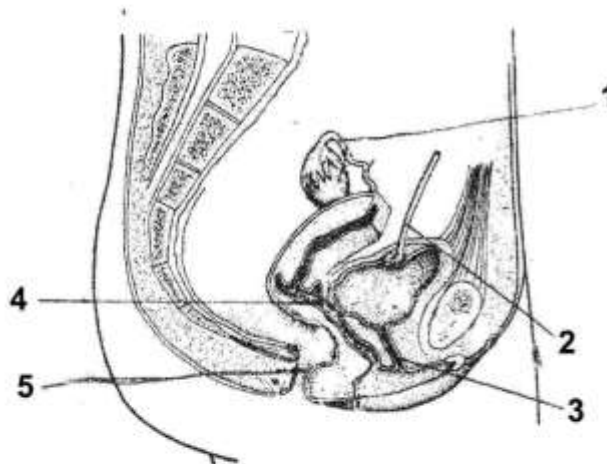
28 The diagrams below illustrate the stages involved in one method of artificial propagation.



What method of artificial propagation is illustrated in the diagrams above?

- A Layering
- B Cutting
- C Grafting
- D Budding

29 The diagram below shows the side view of the female reproductive system.



In which of the labelled parts 1 – 5 do release of sperms and fusion of sperm and ovum take place?

	Release of sperm	Fusion of sperm and ovum
A	3	2
B	4	1
C	5	4
D	3	1

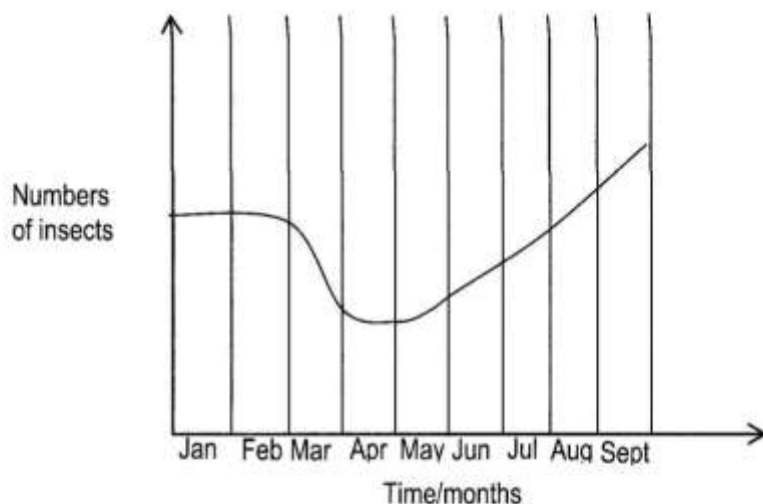
30 Select a contraceptive method that is the most effective out of the following:

- A Spermicide
- B Contraceptive
- C Diaphragm
- D Intrauterine device

- 31 At which stage do secondary sexual characteristics in females develop?
- A Menstruation  
B Gestation  
C Puberty  
D Menopause
- 32 A viral disease caused by pathogens carried in body fluids is ...
- A AIDS.  
B tuberculosis.  
C diabetes.  
D cancer.
- 33 Which of the following correctly identifies the vectors of the pathogens that cause bilharzia, malaria and cholera?

	<b>Bilharzia</b>	<b>Malaria</b>	<b>Cholera</b>
A	Snail	Housefly	Mosquito
B	Housefly	Snail	Mosquito
C	Housefly	Mosquito	Snail
D	Snail	Mosquito	Housefly

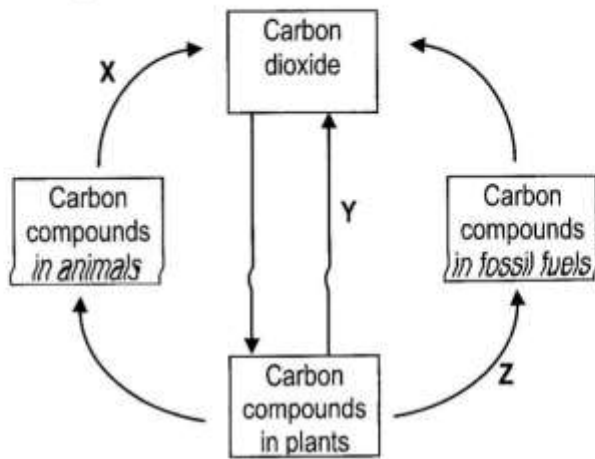
- 34 The order in size of bacteria, viruses and protozoa, starting with the smallest is ...
- A bacteria viruses protozoa.  
B bacteria protozoa viruses.  
C protozoa bacteria viruses.  
D viruses bacteria protozoa.
- 35 The graph below shows changes in the numbers of a species of insects when an insecticide was sprayed on a crop.



During which month was the crop sprayed?

- A March  
B May  
C June  
D September

36 The diagram shows the carbon cycle.



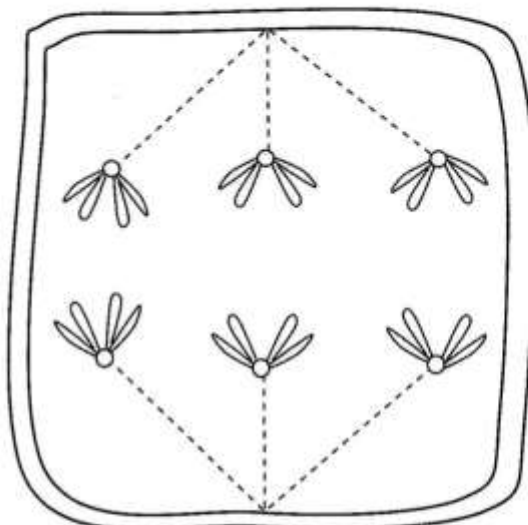
Identify the processes marked X, Y and Z.

	X	Y	Z
A	Photosynthesis	Respiration	Decomposition
B	Photosynthesis	Combustion	Decomposition
C	Respiration	Photosynthesis	Fossilisation
D	Respiration	Respiration	Fossilisation

37 Besides food, which of the following is the most valuable plant product?

- A Wood
- B Medicine
- C Gum
- D Latex

38 The diagram below shows a stage in cell division.

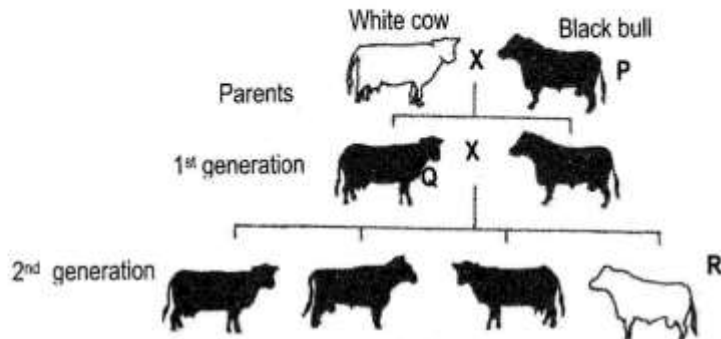


How many chromosomes will be present in each daughter cell after this division?

- A 6 chromosomes as a result of mitosis.
- B 6 chromosomes as a result of meiosis.
- C 3 chromosomes as a result of meiosis.
- D 3 chromosomes as a result of mitosis.

- 39 A man with blood group **AB** marries a woman who is heterozygous for blood group **B**.  
What is the probability of their first child having blood group **B**?
- A 0%  
B 25%  
C 50%  
D 75%

- 40 The diagram below shows the offspring of the cross between a black bull and white cow.  
Let B = black and b = white.



What are the genotypes of the animals labelled **P**, **Q** and **R**?

	<b>P</b>	<b>Q</b>	<b>R</b>
<b>A</b>	Bb	BB	bb
<b>B</b>	BB	Bb	bb
<b>C</b>	Bb	Bb	bb
<b>D</b>	BB	BB	Bb