

GENERAL CERTIFICATE OF EDUCATION (GCE) BOARD
General Certificate Of Education Examination



0510 BIOLOGY 1

JUNE 2021

ORDINARY LEVEL

Centre Number	
Centre Name	
Candidate Identification Number	
Candidate Name	

Mobile phones are NOT allowed in the examination room.

MULTIPLE CHOICE QUESTION PAPER

One and a half hours

INSTRUCTIONS TO CANDIDATES

Read the following instructions carefully before you start answering the questions in this paper. Make sure you have a soft HB pencil and an eraser for this examination.

1. USE A SOFT HB PENCIL THROUGHOUT THE EXAMINATION.
2. DO NOT OPEN THIS BOOKLET UNTIL YOU ARE TOLD TO DO SO.

Before the examination begins:

3. Check that this question booklet is headed "Ordinary Level – 0510 Biology 1"
4. Fill in the information required in the spaces above.
5. Fill in the information required in the spaces provided on the answer sheet using your HB pencil:
Candidate Name, Exam Session, Subject Code and Candidate Identification Number.
Take care that you do not crease or fold the answer sheet or make any marks on it other than those asked for in these instructions.

How to answer the questions in this examination

6. Answer **ALL** the **50** questions in this Examination. All questions carry equal marks.
7. Non-programmable Calculators are allowed.
8. Each question has **FOUR** suggested answers: **A, B, C** and **D**. Decide which answer is appropriate. Find the number of the question on the Answer Sheet and draw a horizontal line across the letter to join the square brackets for the answer you have chosen.

For example, if **C** is your correct answer, mark C as shown below:

[A] [B] **[C]** [D]

9. Mark only one answer for each question. If you mark more than one answer, you will score a zero for that question. If you change your mind about an answer, erase the first mark carefully, then mark your new answer.
10. Avoid spending too much time on any one question. If you find a question difficult, move on to the next question. You can come back to this question later.
11. Do all your rough work in this booklet using the blank spaces in the question booklet.
12. At the end of the examination, the invigilator shall collect the answer sheet first and then the question booklet. **DO NOT ATTEMPT TO LEAVE THE EXAMINATION HALL WITH IT.**

Turn Over

June 2021/0510/1/A/MCQ

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SECTION I
Questions 1-7
(Seven questions)

Directions: Each of these questions or incomplete statements is followed by four suggested answers. Select the best answer in each case and mark the answer sheet appropriately.

1. Is a characteristic of birds;
A possess crop and gizzard as digestive features.
B possess gills for gaseous exchange.
C presence of scales on body for protection.
D are poikilothermic for temperature regulation.

2. Light energy is converted to chemical energy during photosynthesis and stored in the form of;
A minerals.
B carbohydrates.
C vitamins.
D water.

3. Healthy carriers of HIV are,
A HIV negative people who look sick.
B people who look healthy, have the virus but cannot infect others.
C people who look healthy, have the virus and can infect others.
D people who have reached the AIDS stage.

4. The function of the swim bladder in fish is to;
A enable fish to swim fast.
B prevent the fish from changing its direction.
C control the depth at which fish swims.
D enables the fish to detect vibrations.

5. Which three elements make up carbohydrates?
A Nitrogen, oxygen and hydrogen.
B Carbon, hydrogen and oxygen.
C Phosphorus, hydrogen and oxygen.
D Nitrogen, phosphorus and oxygen.

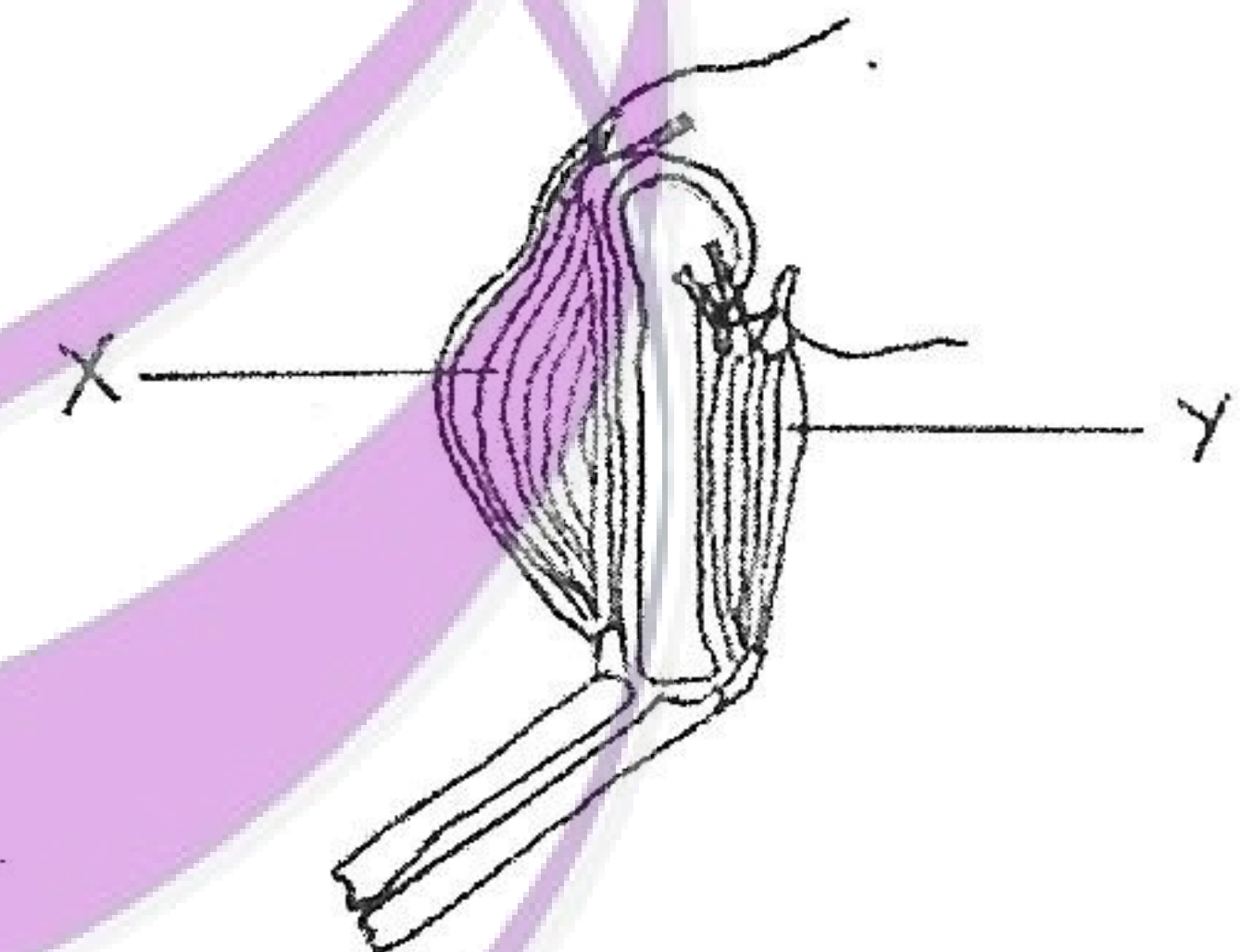
6. Which of the following is an excretory process?
A Release of insulin from the pancreas.
B Release of saliva from the salivary gland.
C Removal of carbon dioxide from the lungs.
D Removal of faeces from the alimentary canal.

7. If the solute percentage inside the cell is 65% while the solute percentage outside the cell is 35%. In what direction will water move?
A Moves out of the cell.
B Moves into the cell.
C Moves in and out of cell.
D No movement in and out of cell.

SECTION II
Questions 8-20
(Thirteen questions)

Directions: This group of questions relates to biological diagrams. Select the best answer for each question.

8. The diagram below shows the human forearm



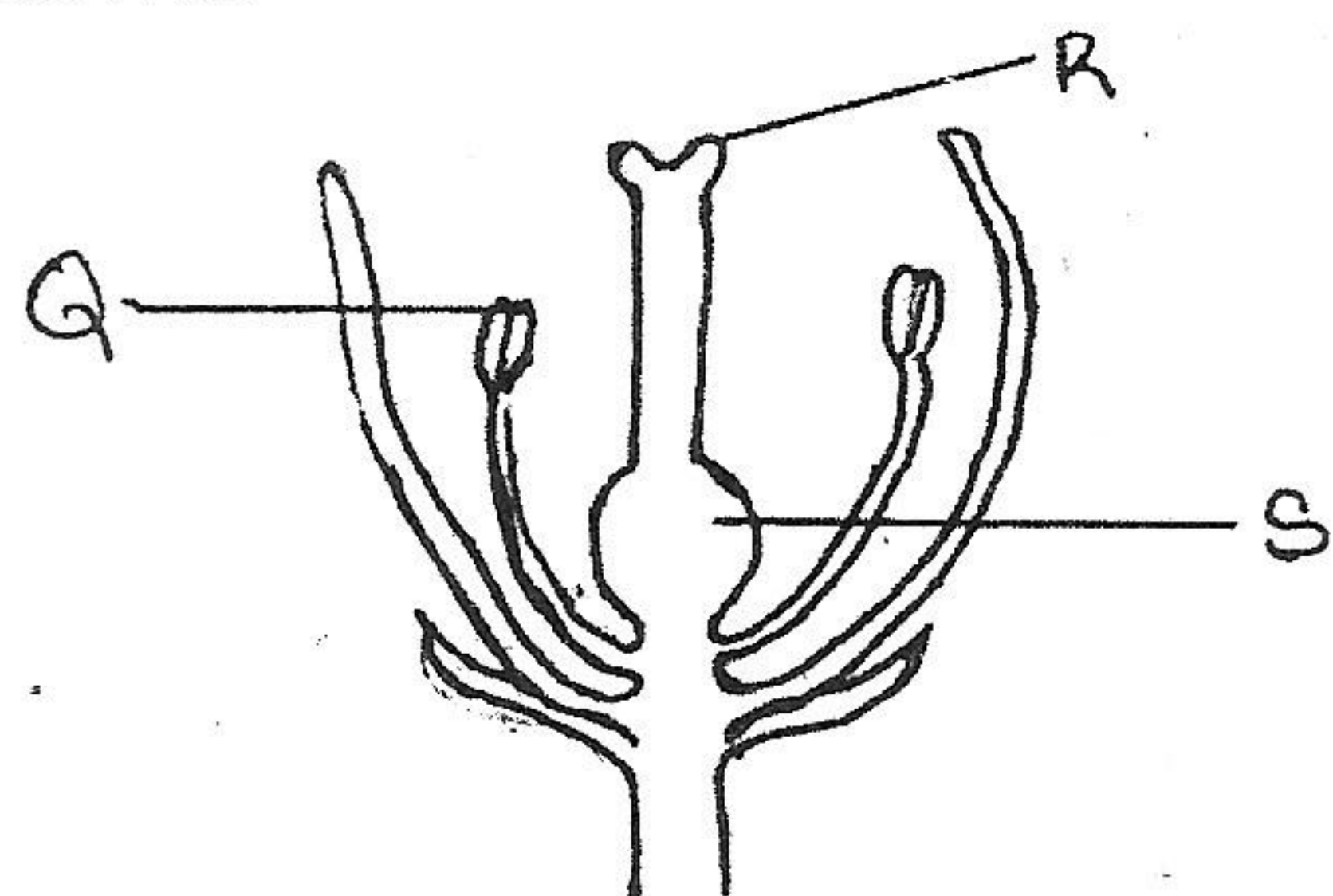
What happens to the muscles X and Y when the arm is flexed?

	X		Y	
A	Relaxes	elongates	contracts	shortens
B	Contracts	elongates	relaxes	shortens
C	Contracts	shortens	relaxes	elongates
D	Relaxes	shortens	contracts	elongates

9. Trace the correct path of impulse transmission.
A Dendrite → Dendron → Axon → Effector.
B Dendron → Dendrite → Axon → Effector
C Dendrite → Axon → Dendron → Effector.
D Axon → Dendron → Dendrite → Effector.



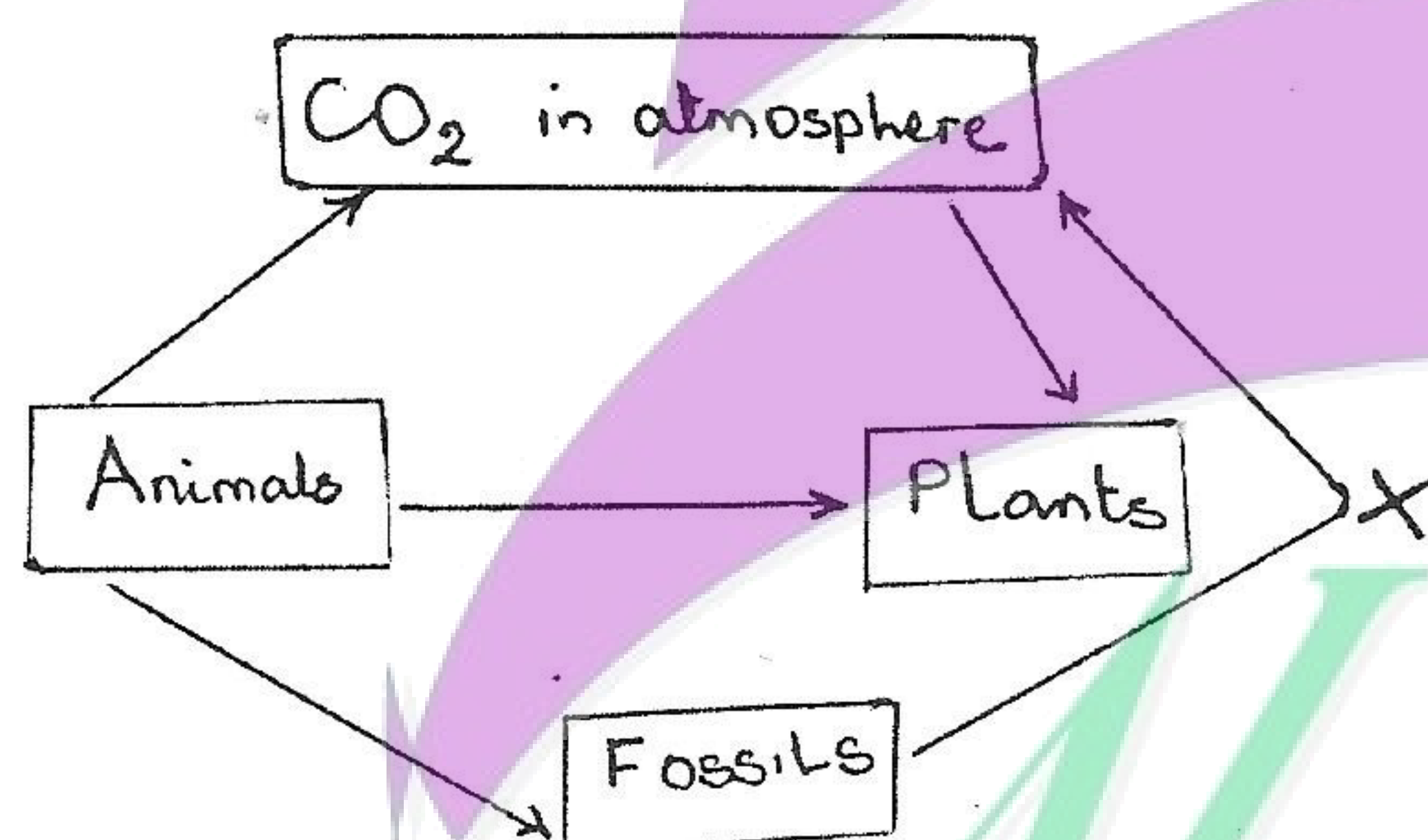
10. The diagram below shows a section through a flower.



When self-pollination occurs, pollen is transferred from;

- A Q to R
- B R to Q
- C Q to S
- D R to S

11. The diagram below represents the circulation of carbon in nature.



What biological process is represented by X?

- A Respiration.
- B Photosynthesis.
- C Death.
- D Combustion.

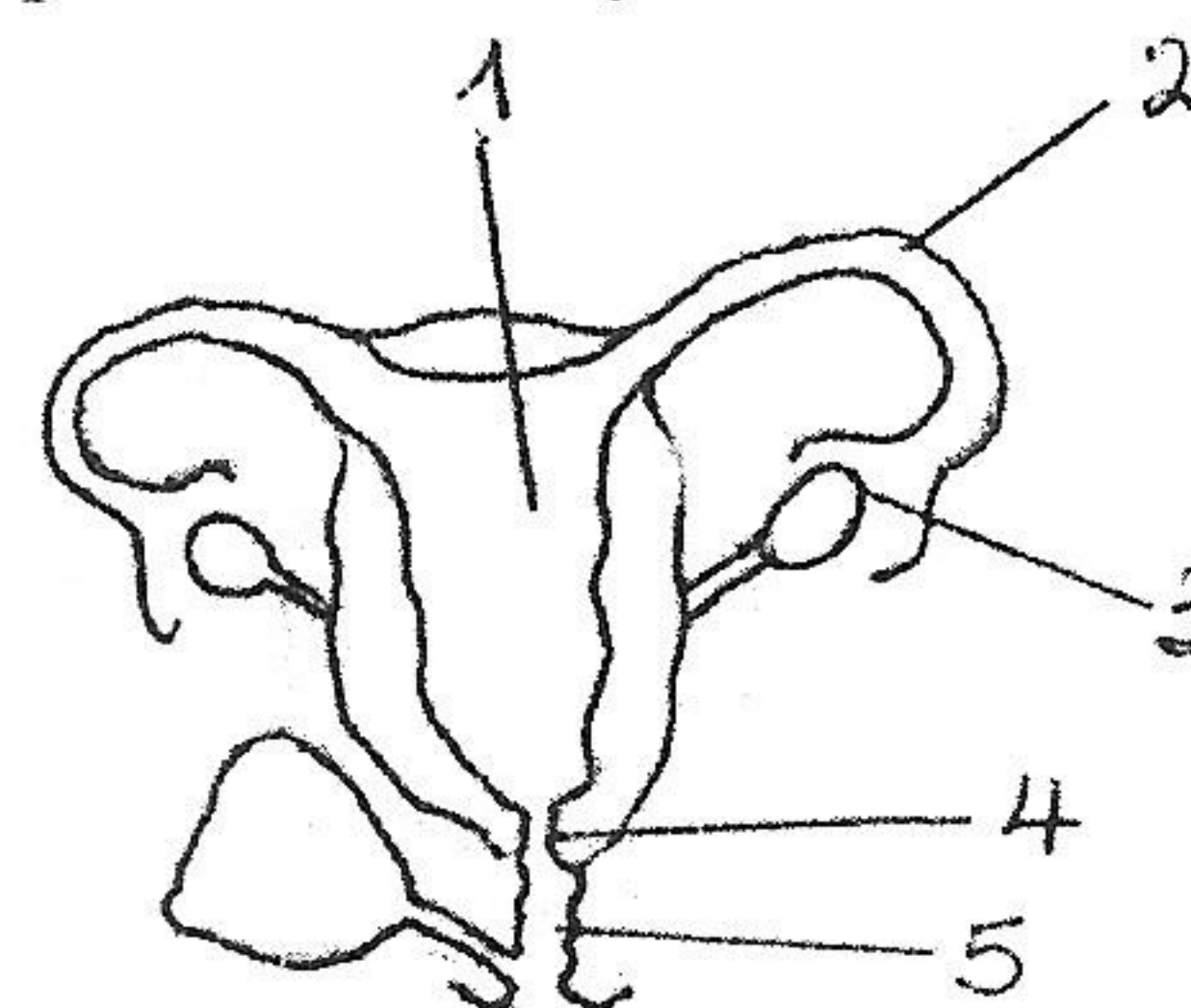
12. Identify the structure that prevents reflux of blood from the aorta to the left ventricle.

- A Bicuspid valve.
- B Semilunar valve.
- C Tricuspid valve.
- D Tendon supporting valve.

13. Choose the correct site of reabsorption of glucose and amino acids in the kidney nephron.

- A Bowman's capsule.
- B Loop of Henle.
- C Distal convoluted tubule.
- D Proximal convoluted tubule.

14. Below is the diagram of the female reproductive system.



The structure numbered 3 secretes the hormones;

- A Oestrogen and Follicle Stimulating Hormone.
- B Follicle Stimulating Hormone and Progesterone.
- C Oestrogen and Progesterone.
- D Progesterone and Luteinizing Hormone.

15. The image formed on the retina from an external object is;

- A not real, smaller and inverted.
- B real, smaller and not inverted.
- C real, larger and inverted.
- D real, smaller and inverted.

16. In which part of the gut does the chemical digestion of proteins begin?

- A Mouth.
- B Duodenum.
- C Stomach.
- D Ileum.

17. In genetic engineering, cut DNA pieces are joined using?

- A DNA ligase.
- B DNA polymerase.
- C DNA helicase.
- D Restriction enzyme.

18. Below are four listed organisms.

- 1 Carnivore
- 2 Decomposer
- 3 Herbivore
- 4 Producer

In an ecosystem, in which order does energy flow through these organisms?

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



Turn Over

19. In which part of the female reproductive system does implantation occur?
- Ovaries.
 - Oviducts.
 - Cervix.
 - Uterus.

20. Which vessel returns oxygenated blood to the heart?
- Vena cava.
 - Pulmonary vein.
 - Pulmonary artery.
 - Aorta.

SECTION III Questions 21-25 (Five questions)

Directions: For each of the questions below, **ONE or MORE** of the responses is (are) correct. Decide which of the responses is (are) correct. Then choose:

A	If 1, 2 and 3 are correct
B	If 1 and 2 only are correct.
C	If 2 and 3 only are correct.
D	If 1 only is correct.

DIRECTIONS SUMMARIZED			
A	B	C	D
1, 2, 3	1, 2 only	2, 3 only	1 only

21. During over heating of the body;
- the hairs of the skin stand erect.
 - the blood vessels below the skin dilate.
 - there is increased production of sweat.

22. Typical of mammals.
- Have mammary glands.
 - Have sweat glands.
 - Are homodonts.

23. After fertilization has taken place in a flowering plant;
- the corolla and calyx wither and fall off.
 - the ovary gradually ripens into a seed.
 - the ovule becomes the fruit.

24. The malaria parasite;
- destroys nerve cells.
 - destroys red blood cells.
 - causes anaemia.



25. Auxins;
- are produced at the shoot tips.
 - increase growth in shoot.
 - inhibits growth in roots.

SECTION IV Questions 26-30 (Five Questions)

Directions: Each of the following questions consists of a statement in the left-hand column followed by a second statement in the right-hand column.

Decide whether the first is true or false.

Decide whether the second is true or false.

Then, on the answer sheet mark;

- If both statements are true and the second statement is a correct explanation of the first statement.
- If both statements are true but the second is NOT the correct explanation of the first.
- If the first statement is true but the second statement is false.
- If the first statement is false but the second statement is true.

DIRECTIONS SUMMARIZED			
	First statement	Second statement	
A	True	True	2 nd statement is a correct explanation of the first.
B	True	True	2 nd statement is NOT a correct explanation of the first.
C	True	False	
D	False	True	

	First statement	Second statement
26	Insulin increases blood sugar level while glucagon decreases it.	Insulin and glucagon are antagonistic hormones.
27	Lack of vitamin D causes rickets.	Vitamin D promotes the absorption of calcium salts for bone formation.
28	The biotic factors in an ecosystem include temperature and water.	Ecosystems are made up of both abiotic and biotic factors.
29	Mosquitoes transmit the malaria causing parasite.	Malaria is contracted from drinking standing water.
30	Maize plants interspersed with leguminous plants grow healthier.	Leguminous plants increase the nitrogen content of the soil.



SECTION V
Questions 31-40
(Ten questions)

Directions: Each question consists of four lettered headings A, B, C, D. Select the heading which is closely related to the description which follows.

31.

- A Nerve cell.
 - B Blood cell.
 - C Sperm cell.
 - D Muscle cell.
- Results from meiotic division.

32.

- A Pacinian corpuscle.
 - B Hair plexus.
 - C Free nerve ending.
 - D Meissner's corpuscle.
- Pressure receptor.

33.

- A Ball and socket joint.
 - B Hinge joint.
 - C Pivot joint.
 - D Gliding joint.
- Allow movement of bones in one direction only.

34.

- A Recombinant DNA.
 - B Restriction enzyme.
 - C Clone.
 - D Plasmids.
- Small circular pieces of DNA found in certain bacteria.

35.

- A Sodium hydroxide.
 - B Pyrogalllic acid.
 - C Potassium hydroxide.
 - D Sodium bicarbonate.
- A chemical that can be used to absorb oxygen in an experiment.

36.

- A Ligament.
 - B Tendon.
 - C Cartilage.
 - D Synovial fluid.
- Prevents wearing out of bones at joints.

37.

- A Cockroach.
 - B Grasshopper.
 - C Termite.
 - D Honey bee.
- Undergoes complete metamorphosis.

38.

- A Cassava.
 - B Ripe banana.
 - C Cooked rice.
 - D Plantain.
- A food stuff that remains brown when iodine is dropped on it.

39.

- A Biological control.
 - B Competition.
 - C Use of pesticide.
 - D Scavenging.
- Using a cat to eliminate rats at home.

40.

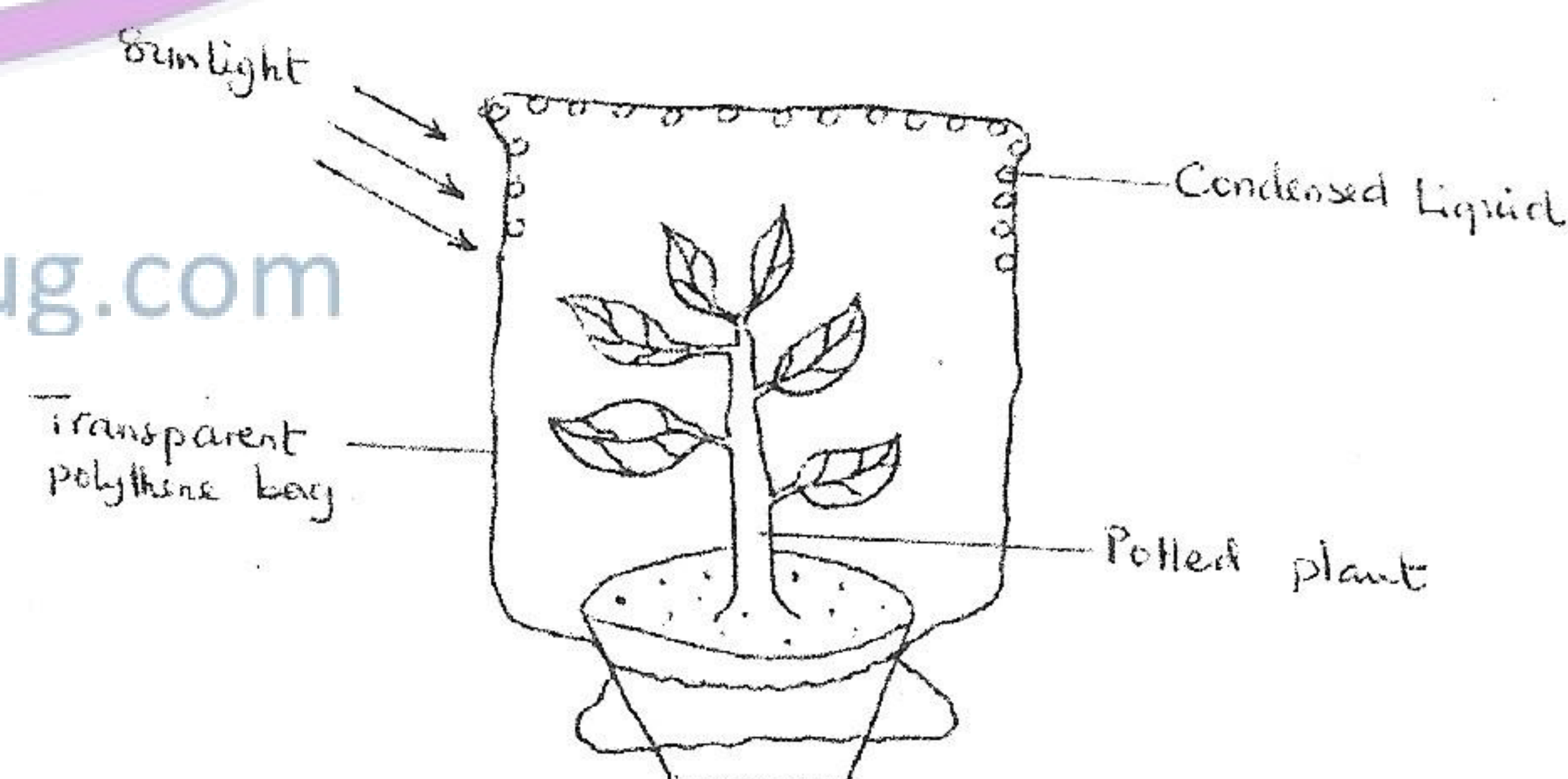
- A Lack haemoglobin.
 - B No nucleus.
 - C Function in transport.
 - D Long lifespan.
- It's a characteristic of white blood cells.

SECTION VI
Questions 41-50
(Ten questions)

Directions: This group of questions deals with biological situations. Each situation is followed by a question. Select the best answer for each question.

41.

When the set up below was exposed to the sun for one hour, gas bubbles condensed into liquid on the inside of the polythene bag.



Identify the condensed liquid and its origin.

- A Oxygen from photosynthesis.
- B Water from transpiring leaves.
- C Carbon dioxide from respiring leaves.
- D Carbon dioxide from respiring soil microbes.

Turn Over

42. In an experiment using guinea pigs to verify the functions of parts of the brain, one structure was removed and it was observed that the animal could not move properly and had no balance at all. Which structure was removed?

A Medulla oblongata.
B Cerebrum.
C Cerebellum.
D Pituitary.

43. Two students were asked to breathe out into two conical flasks containing clear liquids. David breathed into conical flask K and the liquid remained clear. Nadia breathed into conical flask L and the liquid in it turned milky. Identify the contents of the flask K and L and the gas that caused the change in L.

	Flask K	Flask L	Gas
A	Distilled water	Lime water	O ₂
B	Lime water	Caustic soda	O ₂
C	Pyrogalllic acid	Caustic soda	CO ₂
D	Caustic soda	Lime water	CO ₂

44. In an experiment to demonstrate that mammals give off carbon dioxide during respiration, 3 flasks and a respiratory bottle labeled A, B, C and D are used. Flask A contains a chemical to absorb CO₂ from incoming air, Flask B contains lime water which should stay clear, Flask C is the respiratory bottle which contains the small mammal to respire and Flask D contains lime water to test the gas produced. What modification will you make in C if the mammal were to be replaced by a green plant?

A Cover C with a black cloth.
B Place a dish of calcium hydroxide in C.
C Place a dish of sodium hydroxide in C.
D Cover C with a transparent polythene bag.

45. Each egg in a woman's ovary carries an X chromosome. For a normal male zygote to be formed during fertilization,
- A A sperm carrying the X chromosome fuses with the egg.
B A sperm carrying the Y chromosome fuses with egg.
C A sperm carrying an XY chromosome fuses with the egg.
D A sperm carrying an XX chromosome fuses with the egg.

46. What chemical substance is tested for to show that photosynthesis has taken place in a leaf?

A Chlorophyll.
B Glucose.
C Oxygen.
D Starch.

47. In addition to availability of water, which other conditions are essential for seed germination?

A Carbon dioxide and light.
B Oxygen and a suitable temperature.
C Oxygen and soil.
D Soil and suitable temperature.

48. In every ecosystem plants occupy the first trophic level. This is because, they;

A are numerous.
B can withstand atmospheric conditions.
C are capable of converting solar energy.
D have roots that anchor them into the soil.

49. The diagram below is a food chain.

Grass → grasshopper → praying mantis → toad.

Which organism in the food chain above is a secondary consumer?

A Praying mantis.
B Grasshopper.
C Toad.
D Grass.

50. Which of these is a genetically engineered process?

A Production of human insulin.
B Bread making.
C Cleaning of oil spills.
D Wine making.

