

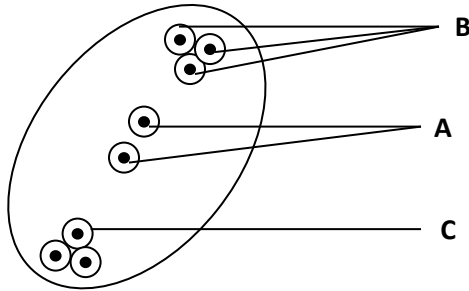
**FORM 3 BIOLOGY NOVEMBER-DECEMBER HOLIDAY ASSIGNMENT**

**INSTRUCTIONS:**

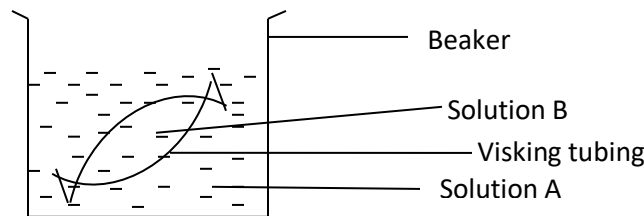
**Answer all the questions**

**WEEK 1**

1. The diagram below shows the structure of the embryo sac.

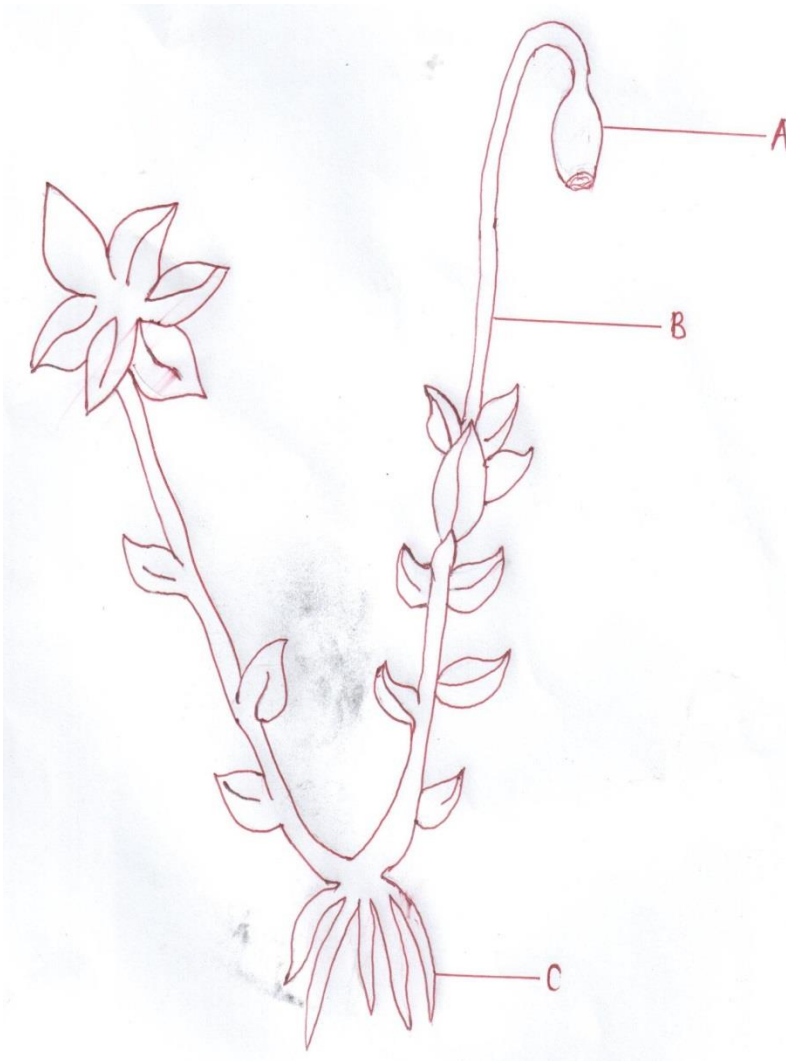


- a) Name the structures labeled A and B. (2mks)
- b) What does structure labeled C transform into after fertilization? (1mk)
- 2. State two reasons why lipids are not the main respiratory substrates although they give more energy per molecule than carbohydrates. (2mks)
- 3. (a) What is meant by the term seed dormancy? (1mk)
- (b) State three causes of seed dormancy. (3mks)
- 4. Explain why the following conditions are necessary during seed germination.
  - a) Oxygen. (2mks)
  - b) Water. (2mks)
- 5. When are two organisms considered to belong in the same species? (2mks)
- 6. A group of students in Huduma boys set up an experiment to investigate a certain physiological process.

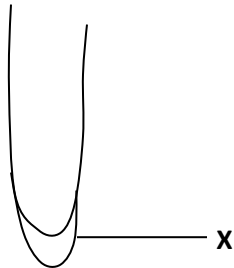


- a) After sometime, the students noted that the visking tubing shrunk and become flabby. What conclusion would you make about the concentration of solutions A and B.? (2mks)
- b) What does a visking tubing correspond to in a living organism? (1mk)

7. Name the cell organelles responsible for the following; (2mks)
- Respiration –
  - Photosynthesis –
8. The diagram below represents a moss plant. Use it to answer the questions that follow.



- Name the parts labeled A, B and C. (3mks)
  - To which division does the plant belong? (1mk)
9. The diagram below represents regions of a root tip.



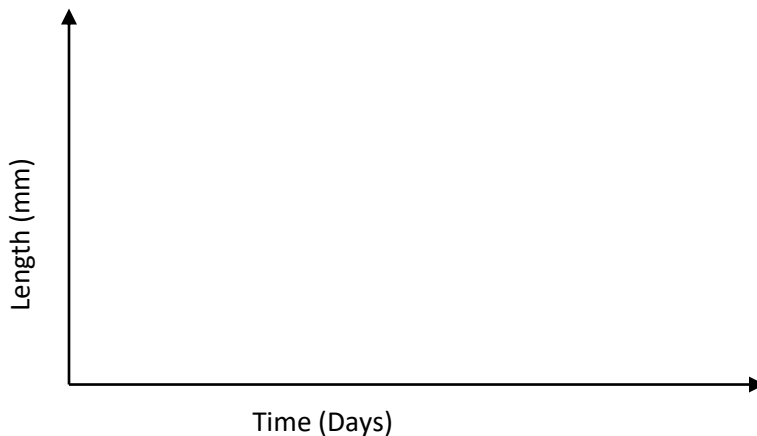
- Name the two regions above X in ascending order. (2mks)

- b) State the function of the part labeled x. (1mk)
10. Distinguish between protandry and protogyny. (2mks)
11. A process that occurs in plants is represented by the equation below.  

$$\text{C}_6\text{H}_{12}\text{O}_6 \rightarrow 2\text{C}_2\text{H}_5\text{OH} + 2\text{CO}_2 + \text{Energy}$$
 (Glucose) (Ethanol)
- a) Name the process. (1mk)  
 b) State two economic importance of process named in (a) above. (2mks)
12. State the role of the following hormones in the life cycle of insects. (2mks)  
 a) Ecdysone hormone –  
 b) Juvenile hormone –
13. (a) What is meant by the term eutrophication? (1mk)  
 (b) State one possible cause of eutrophication. (1mk)  
 (c) What problem does eutrophication create in aquatic ecosystem? (1mk)

## WEEK 2

14. Using the axes provided below, sketch a curve to illustrate the growth pattern observed in phylum arthropoda. (2mks)



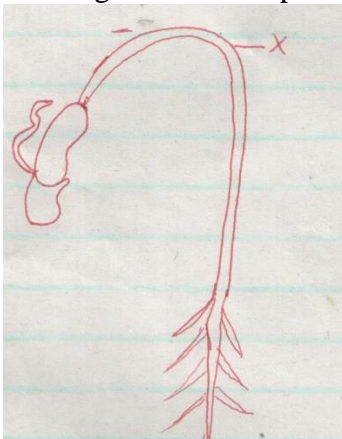
15. State one function of Deoxyribonucleic acid (DNA) molecule. (1mk)  
 16. Explain why plants do not require specialized excretory organs. (2mks)  
 17. How is the human sperm cell structurally specialized? (3mks)
18. State any two applications of plant hormones in agriculture. (2mks)
19. Differentiate between continuous and discontinuous variation giving an example in each case. (3mks)
20. In fish, blood in the gill filaments and water flowing over their surfaces, flow in the opposite direction.  
 a) What name is given to the system or type of flow? (1mk)  
 b) What is the biological importance of this type of flow? (2mks)

- c) With the aid of a well labeled diagram, illustrate this type of flow. (2mks)
21. Name a disease caused by lack of each of the following in human diet. (2mks)
- Vitamin D –
  - Iodine –

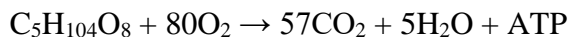
22. Why are green plants referred to as primary producers in an ecosystem? (2mks)

23. State two main causes of variations in living things. (2mks)

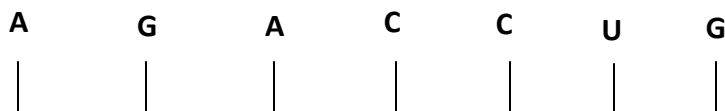
24. The diagram below represents a stage during germination of a seed.



- Name the type of germination illustrated in the diagram above. (1mk)
  - Name and state the role of part labeled x during germination of the seed (2mks)
25. The chemical equation shown below represents the oxidation of a certain substrate in the living tissues of a grasshopper.



- Calculate the RQ value of the food substrate. (3mks)
  - Identify the food substrate whose RQ value has been worked in (a) above. (1mk)
26. The diagram below is a section of certain nucleic acid together with its nitrogenous bases.



- With a reason, identify the type of nucleic acid from which the portion was obtained. (2mks)  
State one structural difference between Deoxyribonucleic acid (DNA) and ribonucleic acid (RNA) (2mks)
27. Name the forces which are responsible for the upward movement of water from the roots towards the stem. (3mks)
28. (a) State the features and mechanisms which hinder self pollination and self fertilization from taking place in plants. (3mks)

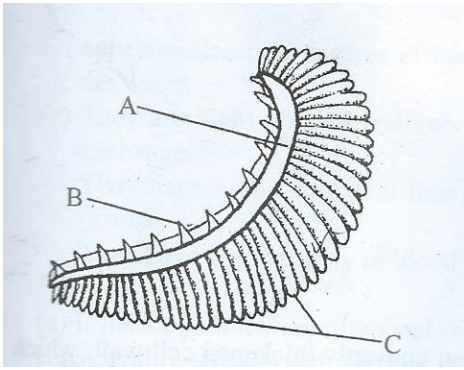
- (b) Give a reason why secondary thickening does not occur in bamboo and maize plant. (2mks)

### **WEEK 3**

1. State the use of each of the following. (3mks)
  - a) Ribosomes
  - b) Mitochondria
  - c) Lysosome
2. A 'dolf' is an offspring between a wolf and a dog. This animal is infertile. Give a reason for this. (1mk)
3. a) What is a hypotonic solution? (1mk)  
b) Explain the changes that will be observed if a drop of human blood is added to this solution. (3mks)
  - c) State four importance of osmosis to plants. (3mks)
4. Give two main branches of Biology. (2mks)
5. A certain animal has no incisors and no canine but has six premolars and 6 molars in the upper jaw. In the lower jaw there are 6 incisors, 2 canines, 6 premolars and 6 molars.
  - a) What is the dental formula of the animal? (1mk)
  - b) Calculate the total number of teeth. (1mk)
  - c) Giving reasons, state the mode of feeding. (2mks)
6. State and explain three environmental factors that affect transpiration. (6mks)
7. A man is of group A+.
  - a) What type of antigen does his blood have? (1mk)
  - b) What types of antibodies are present in his blood? (1mk)
  - c) Which blood groups can he receive blood from? (2mks)
8. (a) How is the mitochondrion adapted to its function? (2mks)  
(b) In which part of the mitochondrion does aerobic respiration take place? (1mk)

### **WEEK 4**

9. State four structural differences between arteries and veins. (4mks)
10. State three characteristics of a respiratory surface. (3mks)
11. The diagram below illustrates the structure of a gill from a bonny fish.



a) Name the structures labelled A, B and C and give their functions. (6mks)

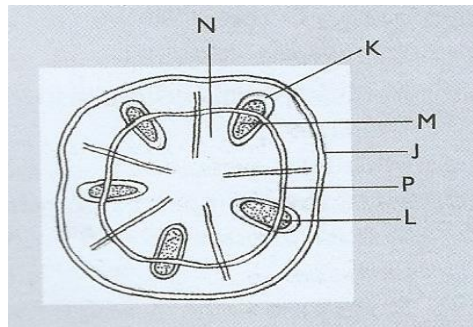
A  
B  
C

b) How is structure labeled C adapted to its function? (1mk)

12. State the functions of the following parts of a microscope. (3mks)

- Diaphragm
- Condenser
- Fine adjustment knob

13. The diagram below represents a transverse section of a part of a young plant and seen under light microscope.



a) From which part of the plant was the specimen obtained? (1mk)

b) Name the parts labelled J,P and M. (3mks)

c) Name the functions of the part labelled M. (1mk)

14. State three factors that determine the amount of energy a human requires in a day. (3mks)

15. State two defects of circulatory system. (2mks)

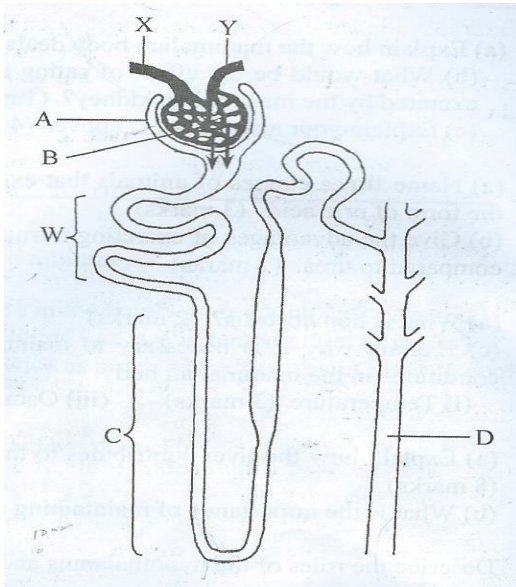
b) State three adaptations of erythrocytes to their functions. (3mks)

16. A jet aeroplane is able to move and oxidise fuel to carbon (IV) oxide and water yet it is not classified as a living thing. List other characteristics of living things not shown by a jet aeroplane. (3mks)

17. Outline three applications of anaerobic respiration. (3mks)

18. Define the following terms. (3mks)

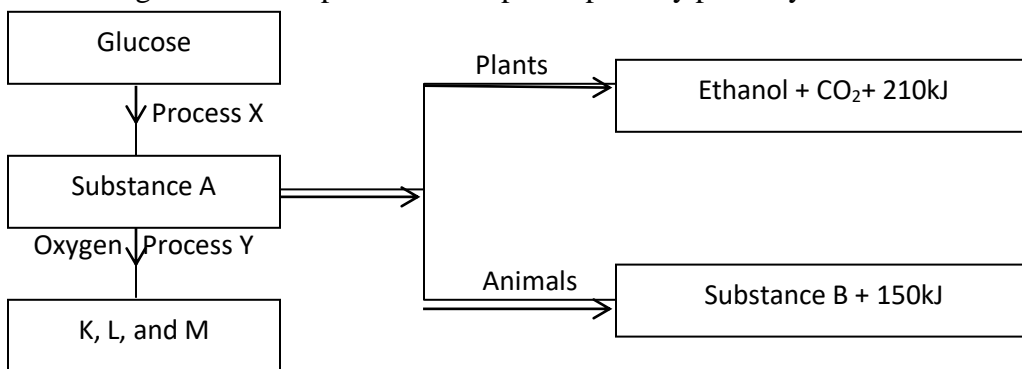
- Excretion
- Secretion
- Homeostasis
- The diagram below illustrates a nephron from a mammalian kidney.



- Name the parts labelled A, B, C and D. (4mks)
- Name the process represented by arrows. (1mk)
- Name three substances that are completely reabsorbed in the part labelled W in a normal human being. (3mks)
- Name the component of blood that do not enter the renal tubule in mammals. (1mk)
- How does the part labelled C of a camel compare with that of a hippo? (2mks)

**WEEK 5**

1. The diagram below represents a simple respiratory pathway in cells.



- Name the process marked X and Y. (2 marks)
- State two differences between process X and Y. (2 marks)

c) State the name of substance B and condition under which it is formed.

(2marks)

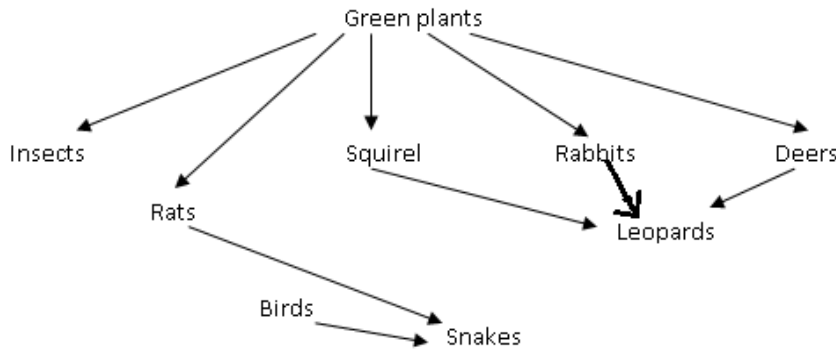
Name.....

Condition.....

d) Explain how body size affects the rate of respiration in animals.

(2marks)

2. The diagram below represents a food web from Lake Nakuru national park.



a) With a reason, identify the organism with the largest biomass.

(2 marks)

b) From the food web isolate a food chain ending with snakes as tertiary consumer.

(1mark)

c) (i) Name any **two** organisms not shown in the food web but would be present in the ecosystem.

(2

marks)

(ii) What is the role of the organisms stated in (i) above in the ecosystem.

(1mark)

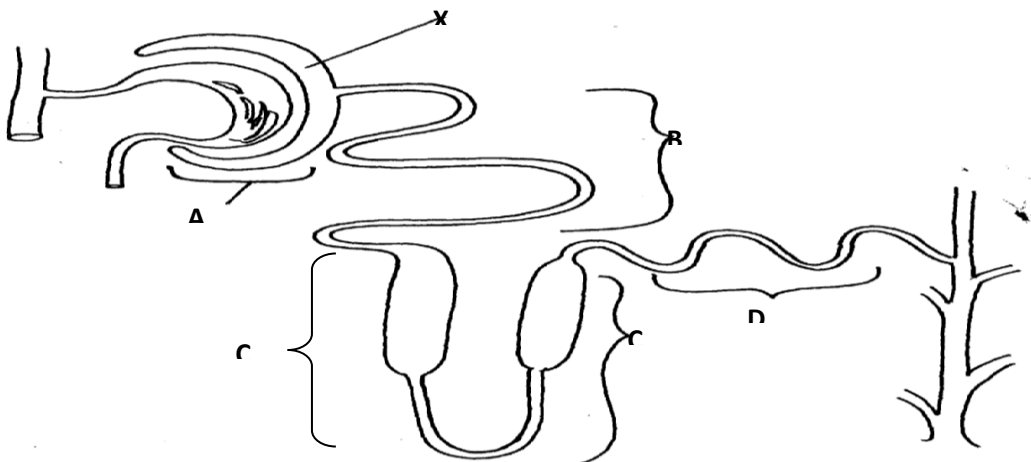
d) From the food web, snakes and leopards feed on rabbits. What name is given to this kind of competition?

(1mark)

e) Name an organism that may be both secondary and tertiary consumer.

(1mark)

3. The diagram below represent the structure of a nephron. Study it and answer the questions that follow.



part labeled B.

ck into blood

(1mark)



(ii) How is the part labeled B adapted to carry out the physiological process named in 3 (a) (i) above.

(1mark)

b) In which part of the kidney is the part labeled A abundantly found. (1mark)

c) On the diagram above, indicate the direction of flow of blood using arrows at the part labeled C.

(1mark)

d) State the functions carried out by the following hormones in the functioning of the nephron.

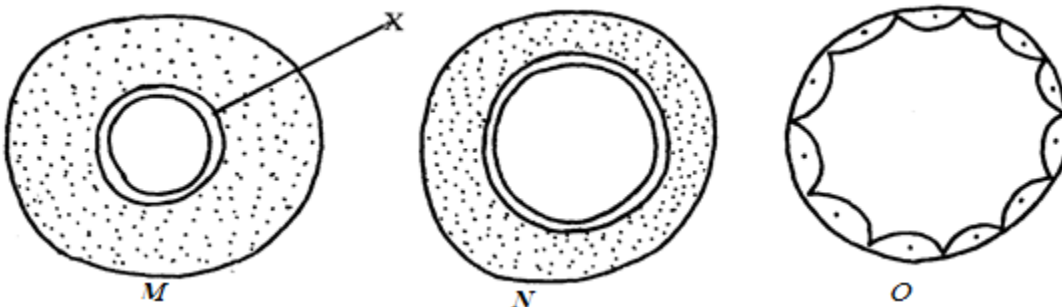
(i) Aldosterone.

(2marks)

(ii) Anti-diuretic hormone.

(2marks)

4. Diagrams M, N and O below show cross-sections of three different types of blood vessels. They are not drawn to scale. Use them to answer the questions that follow.



(a) Identify blood vessels M, N and O

(3marks)

(b) (i) Name the layer labeled X on vessel M

(1mark)

(ii) State two ways in which vessels M is adapted to its functions

(2marks)

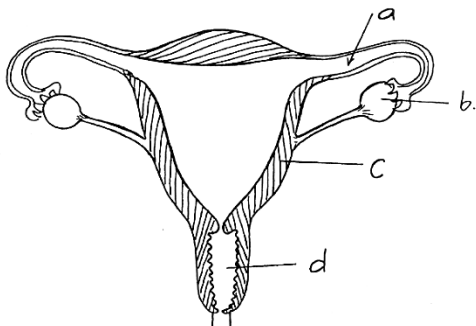
(c) (i) What is an immune response?

(1mark)

(ii) Name one disease that is effectively controlled through vaccination.

(1mark)

5. Study the diagram below and answer the questions that follow.



(a) (i) may

Which part marked a, b, c and d, when defective after implantation

lead to abortion.

(1 mark)

(ii) Give a reason for your answer.

(1 mark)

(b) part labeled b can be removed after 4 months of pregnancy without interfering with the pregnancy. Explain.

(2 marks)

(c) Under each of the following disease, state the name of the causative agent.

(i) Syphilis

(1 mark)

(ii) Gonorrhoea

(1 mark)

(iii) AIDS

(1 mark)

(d) State **two** disadvantages of external fertilization.

(2 marks)

## WEEK 6

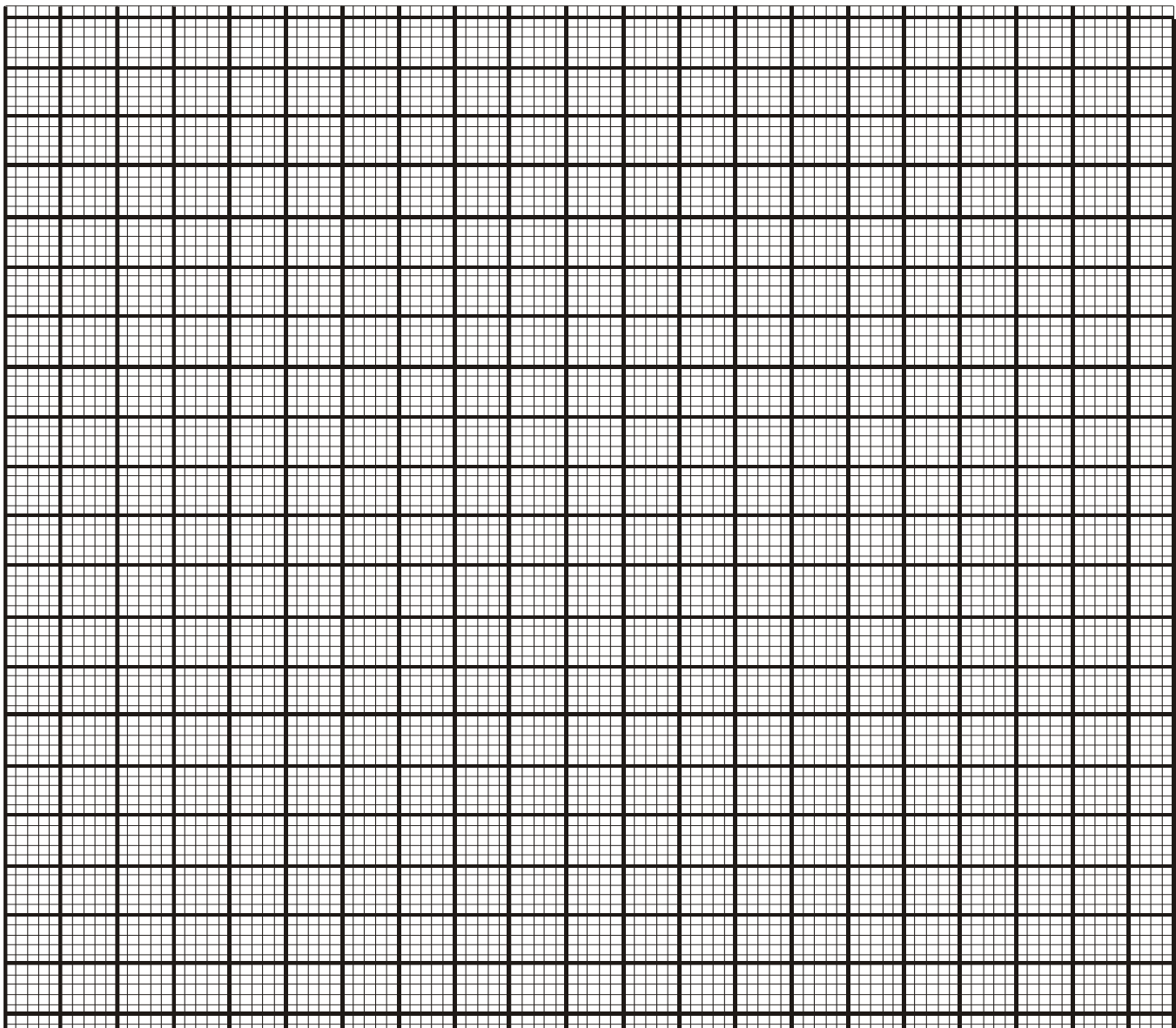
### **SECTION B: (40 MARKS)**

6. The percentage germination of certain seeds at different temperatures was determined as follows.

Temperature (°C)	0	10	20	30	40	50
% Germination	0	30	40	50	20	0

a) Using a suitable scale, plot a graph of % germination against temperature.

**(5marks)**



- b) Account for % germination at
- i) 0°C (2marks)
  - ii) 30°C (2marks)
  - iii) 50°C (2marks)
- c) What is seed viability? (1mark)
- d) Explain the role of the following during germination
- i) Hormones (2marks)
  - ii) Enzymes (2marks)
- e) State **two** differences between epigeal and hypogeal germination. (2marks)
- f) State a reason why secondary growth does not take place in tomato plants. (1mark)
- g) State **one** difference between a seed and a fruit. (1mark)
7. a) Describe the characteristics of gaseous exchange surfaces (4marks)
- b) Describe the mechanism of gaseous exchange in a mammal. (16marks)
8. a) State **three** aspects of light that are important in photosynthesis. (3marks)
- b) Describe how the leaves of plants are adapted to carry out photosynthesis. (17marks)