1. **Ecology**

1.What is the primary energy source of life on earth?

2. What is the main means by which autotrophic organisms obtain energy?

3. Which autotrophic group is responsible for the production of the majority of the molecular oxygen on earth?

4. In the ecological study of food interactions, what are autotrophic organisms called?

5. How are heterotrophic organisms divided in the ecological study of food interactions?

6. What is a food chain?

7. How is energy transferred along a food chain?

8. What are trophic levels? How many trophic levels can a food chain have?

9. What are primary consumers? Can a food chain have quaternary consumers without having secondary or tertiary consumers? Can a tertiary consumer of one chain be a primary or secondary consumer of another chain?

10. Explain the term Trophic Pyramids

11. What are the three main types of trophic pyramids studied in ecology?

12. What do numeric pyramids represent?

13. In a numeric pyramid, what trophic level is the base? What about the top level?

14. In a numeric pyramid, is it possible for the base to be smaller than the other levels?

15. In the short term, what will happen to the levels above and below a population of secondary consumers of a numeric pyramid if a large number of individuals from this population dies?

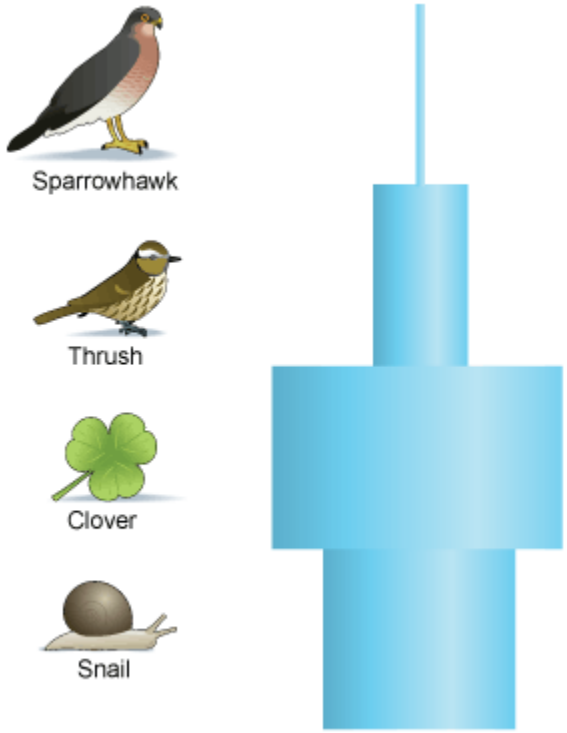
16. What do biomass pyramids represent?

17. What is dry mass?

18. What do energy pyramids represent?

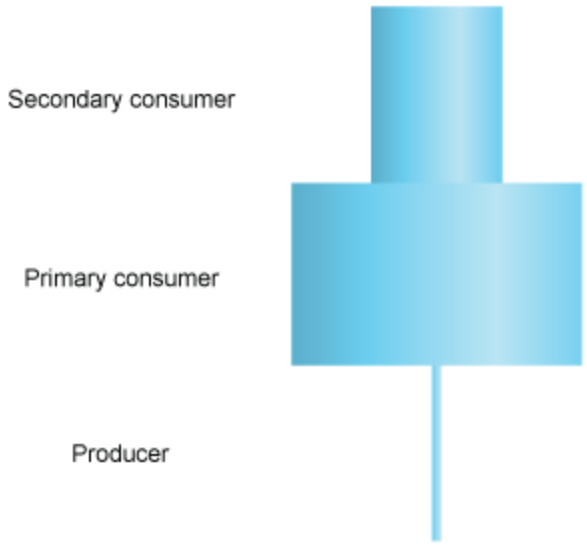
19. Into which type of energy is the light used in photosynthesis

20. What is wrong with this pyramid of numbers?



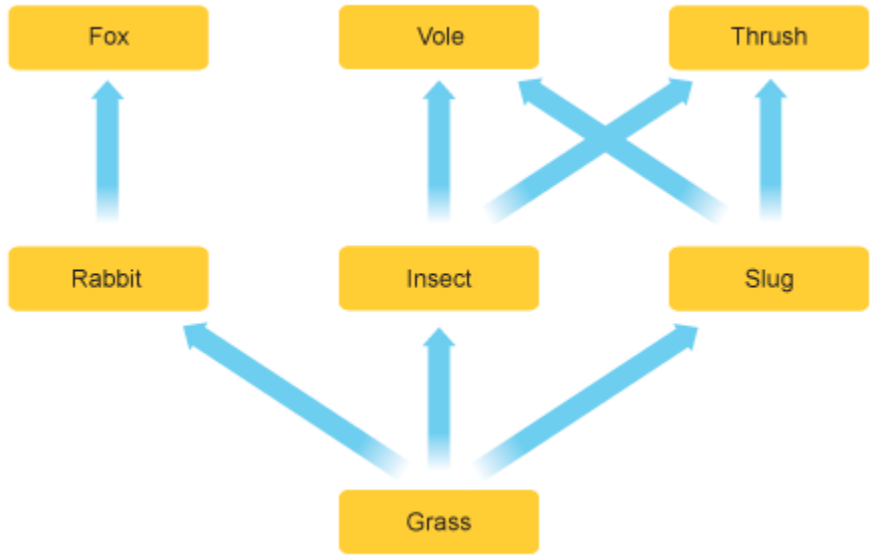
- hawks don't eat thrushes
- the clover should be at the bottom
- snails don't eat clover

21. What can we conclude from this pyramid of numbers?



- the producer must be very large
- the producer must be very small
- the primary consumer must be a carnivore

22. What is likely to happen to the population of slugs if the population of thrushes decreases?



- it will increase

- it will decrease
- it will stay the same

2.Movement in and out of the cell

22.(a)(i)What is osmosis?

(ii)What is a selectively permeable (semi-permeable) membrane?

(b)(i)Draw a labelled diagram of the apparatus that you used to demonstrate osmosis.

(ii)Describe how you carried out the experiment to demonstrate osmosis.

(iii)How were you able to tell that osmosis had taken place?

23.(a)(i)Define the term *osmosis.*

(ii)Give an example of osmosis in plants.

(b)Answer the following questions in relation to practical work you carried out to investigate osmosis.

(i)In the space below draw a labelled diagram of the apparatus you used in the investigation.

(ii)Describe how you used this apparatus to carry out the investigation.

(iii)State the result(s) of your investigation.

(iv)Briefly explain the result(s) you have given in part .

24.(i)Water enters the roots of plants by osmosis. Explain what is meant by osmosis.

(ii)Describe how you demonstrated osmosis as part of your practical activities

25.Desscribe the endocytosis and exocytosis

26.Differentiate the active from passive transport

27.Define the term diffusion and explain the factors affecting its rate

28.Describe the significance of diffusion in the living organisms

29.Explain the reason why the transport mechanism across the cell membrane is required

30.Explain the factors of osmosis

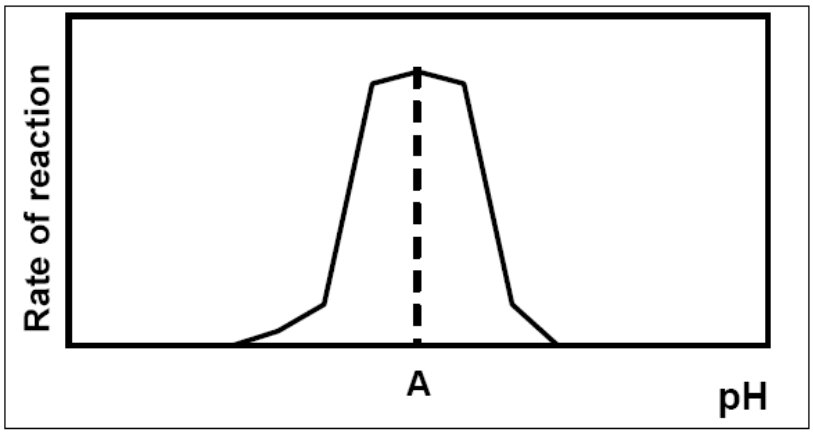
31.Explain the significance of osmosis in the organisms

32.Explain the how osmosis affect animal and plant cell

33.Define:water potential,osmotic potential,wall pressure,plasmolyzed cell,turgidity,turgor pressure

3.<u>Enzymes</u>

34. The graph shows how the rate of reaction of a carbohydrate-digesting enzyme in the human alimentary canal varies with pH.



(a)A is said to be the enzyme's …….pH

(b)Suggest a temperature at which human enzymes work best

(c)What term best describes the shape of an enzyme?

35. (c) Enzymes are used in many processes in both plants and animals.

(i) What is an enzyme?

(ii) Name any **one** enzyme, **and** its substrate, **and** its product.

(iii) The rate of activity of enzymes can be affected by various factors.

Name any **two** factors that can affect enzyme activity.

(iv) Enzymes are sometimes immobilised in industrial processes.

What is meant by the term *immobilised* in relation to enzymes?

(v) Give **one** advantage of using immobilised enzymes.

36 .Select the correct term from the following list to match each of the terms in column A and write it in column B.

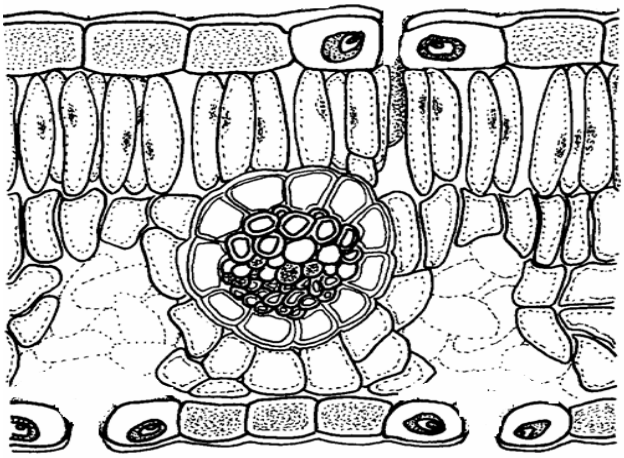
protein, enzyme, uracil, sap, ethanol, mutation, thymine, chlorophyll.

A	B
DNA	
Ribosome	
Vacuole	
Fermentation	
RNA	
Active Site	
Variation	

37.Describe different properties of enzymes

.**Photosynthesis**

38. The diagram shows part of a section through a leaf.



(c)Use the letter **B** to show the part of the leaf in which most photosynthesis occurs.

(d)Name the structures in plant cells in which photosynthesis occurs.

(e)In addition to carbon dioxide another small molecule is needed for photosynthesis.

Name this other molecule

39. (a)(i)In what main part of a plant does most photosynthesis take place?

(ii) In what cell structure does photosynthesis take place?

(b)(i)What is the main source of energy for photosynthesis?

(ii) Suggest **two** reasons why life on earth might not continue without photosynthesis.

(iii) In photosynthesis water (H_2O) is split into three products.

1. Name these **three** products.
2. State what happens to each of these products.

(c)Describe an activity that you carried out to investigate the influence of light intensity **or** carbon dioxide concentration on the rate of photosynthesis. Include a diagram of the apparatus that you used in your answer.

40. (a)(i)Write the balanced equation for photosynthesis.

(ii) What is the main source of light for photosynthesis?

(iii) During photosynthesis water molecules are split into **three** products.

Name **each** of these products.

(iv) Describe what happens to **each** of the products referred to in (iii).

(v) Name the structures in which photosynthesis occurs in plant cells.

41. (i) Write a balanced equation for photosynthesis.

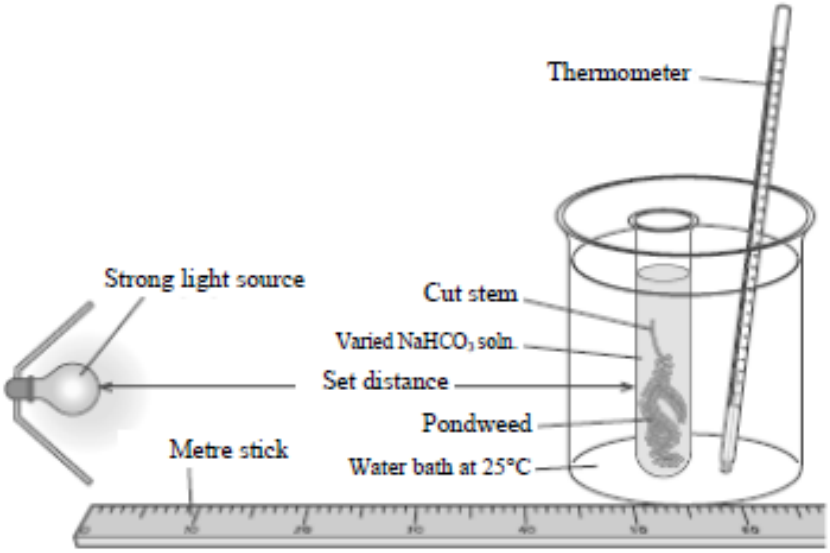
(ii) Plants contain the green pigment chlorophyll.

What is the role of chlorophyll in photosynthesis?

(iii) The apparatus shown below may be used to investigate the effect of an environmental factor on the rate of photosynthesis.

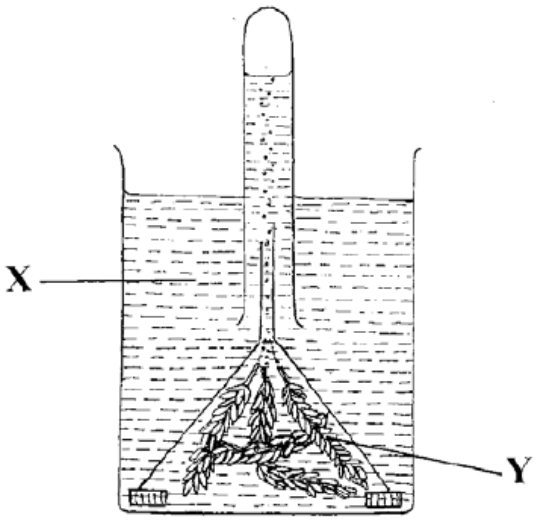
1. Name any **two** environmental factors affecting photosynthesis that could be investigated using the apparatus shown.

43. How would you measure the rate of photosynthesis using the apparatus below?



44.Explain the importance of photosynthesis on the ecosystem

45.The apparatus shown below may be used to investigate the effect of an environmental factor on the rate of photosynthesis.



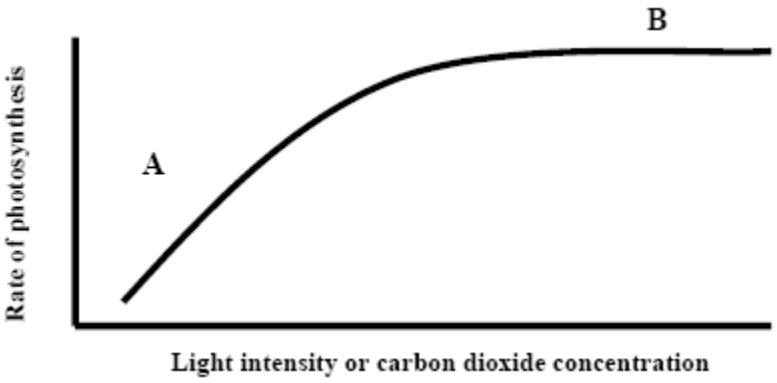
(i) Name X and Y.

(ii) How would you measure the rate of photosynthesis?

(iii) Name an environmental factor that you would vary in this experiment.

(iv) Explain how you would vary the factor that you have named in (iii).

46. The following graph shows how the rate of photosynthesis varied when a plant was subjected to varying levels of light intensity **or** carbon dioxide concentration.



(a) What is happening at A? …….

(b) What is happening at B? ……

(c) Suggest a reason for your answer in (b) ……..……

(d) here in a cell does photosynthesis take place? ……

(e) Give **two** sources of the carbon dioxide that is found in the atmosphere.

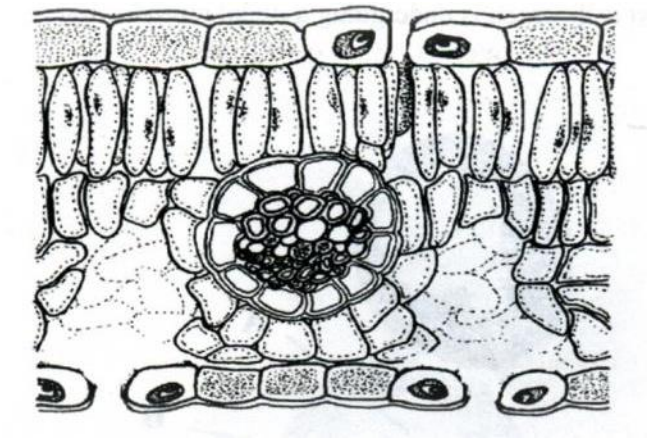
(f) Suggest **one** way in which the rate of photosynthesis of plants in a greenhouse could be increased

5.<u>Excretion in plants and animals</u>

47. Complete the following sentence by putting one word in the blank space.

(a) Tiny holes called …….. allow gases to enter and leave the leaf.

48. The diagram shows part of a section through a leaf



(a)Use the letter A to show a point of entry of carbon dioxide. Name this point

(b)Name a gas that **leaves** the leaf at this point …….

(c)Use the letter B to show the part of the leaf in which most photosynthesis occurs.

(d)Name the structures in plant cells in which photosynthesis occurs …….

(e)In addition to carbon dioxide another small molecule is needed for photosynthesis.

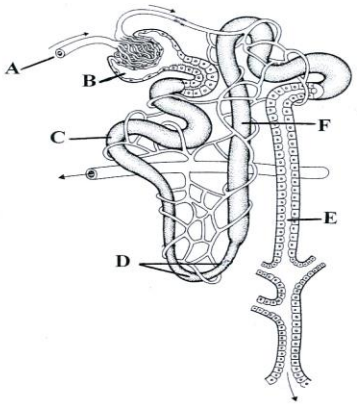
Name this other molecule …….

49. (a)(i)What is meant by excretion?

(ii) Urea and carbon dioxide are excretory products of the human body. In the case of each product name a substance from which it is derived.

(b)The diagram shows the structure of a nephron and its associated blood supply.

(i) Name the parts A, B, C, D, E and F.



(ii) From which blood vessel is A derived?

(iii) Where in the kidney is B located?

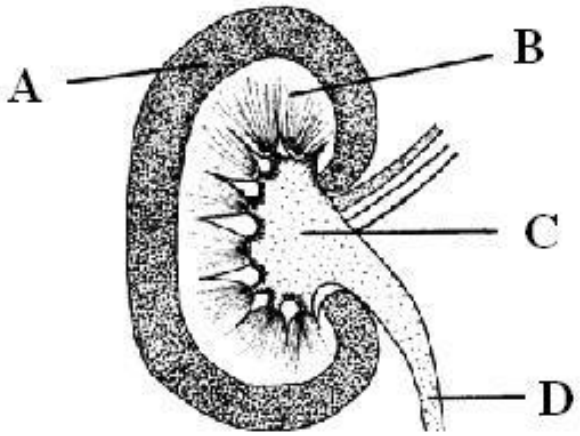
(iv) Give the part of the nephron in which each of the following takes place:

1. filtration, 2. reabsorption of amino acids.

(v) Give **two** features of the nephron that aid filtration.

(vi) Name a group of biomolecules in the blood which are too large to pass through the filtration system of the nephron.

50.(a) The diagram shows a vertical section through a human kidney.



(i) Name the parts A, B, C, D.

(ii) To what structure does D link the kidney?

(iii) Where does filtration occur in the kidney?

(iv) Filtration ensures that cells and valuable substances are not lost from the body when urine is being formed. Name **two** of these substances or cells.

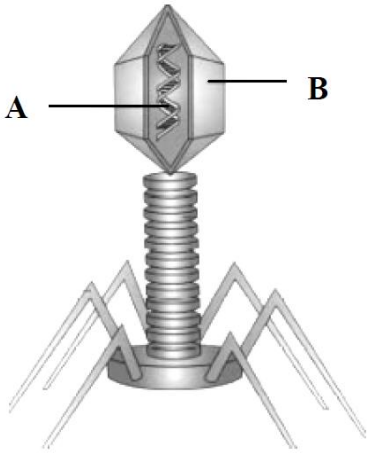
(v) Suggest a treatment that may be used for a person whose kidneys are not carrying out their normal functions.

(vi) Name an organ in the human body, other than the kidney, in which excretion takes place.

51.Suggest 3 ways we can maintain healthy urinary system

6.**Immunity**

52. The diagram shows the structure of a type of virus.



(i)Name the parts labelled A and B.
(ii)State two harmful effects of viruses.
(iii)What is meant by the term *immunity*?
(iv)The skin is an important part of our immune system.
Outline **two** ways in which the skin provides immunity.
(v)To help the immune system, many people receive vaccinations during their lifetime.

What is meant by the term *vaccination*?
(vi)Antibiotics are usually not given to a person suffering from a viral infection.
Suggest a reason for this.

(c)(i)Suggest **two** situations which may result in a drop in the water content of the blood.

(ii) When the water content of the blood drops a hormone is released.

Name this hormone and the endocrine gland from which it is secreted.

(iii) Give a precise target area for this hormone. How does the hormone reach the target area?

(iv)Explain the role of the hormone at its target area, when the water content of the blood is low.

53.a) (i)What is meant by the term immunity? Distinguish between active and passive immunity.

(ii) Describe two ways in which the skin helps to defend the body against pathogenic micro-organisms.

(iii) Lymphocytes play a vital role in the body's immune system. To which group of blood cells do lymphocytes belong? Name two types of lymphocyte and state a role of each.

(iv) What is the purpose of vaccination?

53.Define:immune response,Antigen,antibodies,Autoimmunity,self and nonself antgen,autoimmune disease,Immunodeficient person,serotherapy,chemotherapy,Vaccination,Immunazation.

54.Explain the mode of action of antibodies

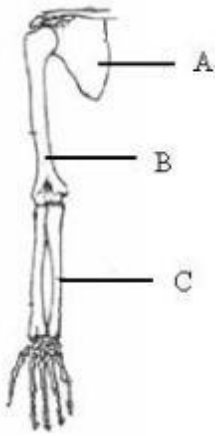
55.State 3 problems resulting from the abnormal immune response

56.Explain the way the body fight against a pathogen

5 7.Differentiate the artifial passive immunity from natural active immunity and give examples

7.Skeleton,muscles and movement

58.(a) The diagram shows the bones of the human arm.



(i) Name the parts labelled A, B and C.

(ii) What structures attach a muscle to a bone?

(iii) Which upper arm muscle contracts to raise the lower arm?

(iv) What is meant by the term *antagonistic pair* in reference to muscles?

(v) Name the type of joint at the elbow.

(vi) Apart from movement, give **one** other function of the skeleton.

(vii) Suggest **one** reason why the bones of birds are almost hollow

59. (i)State **two** functions of the human skeleton.

(ii)The vertebrae form part of the axial skeleton. Name the vertebrae found in:

1.Te neck,

2.The small of the back.

(iii)Name the part of the central nervous system that runs through the vertebrae.

(iv)Name the **three** bones that form the human arm.

(v)Write a short note (about five lines) on **one** of the following:

arthritis or osteoporosis.