FORM ONE BIOLOGY TOPICAL QUESTIONS *(ALL TOPICS TESTED)*



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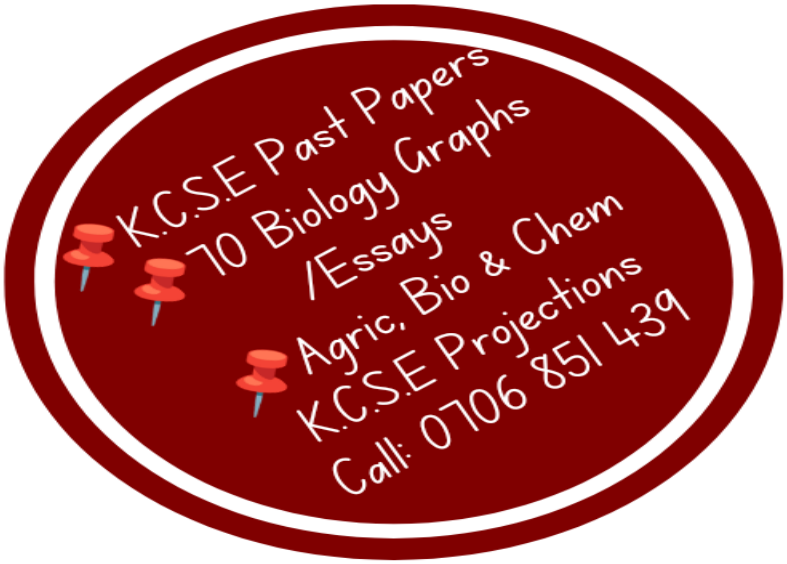
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1. CLASSIFICATION I &II

1. Name **two** classes of phylum arthropoda with cephalothorax.

2. List any **three** distinguishing features of class mammalia.

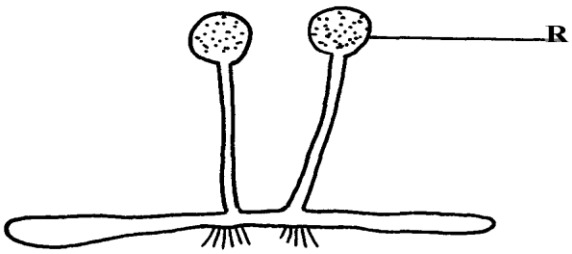
3. Give **two** characteristics that distinguish scientific names of organisms from the ordinary names

4. (a) In which kingdom do bacteria belong?

(b) Give any **two** benefits of bacteria to man

5. Name the phylum whose members possess notochord

6. The diagram below represents a bread mould:-



(a) Identify the kingdom to which the organism belongs:-

7. Give a reason why no moulting occurs during the adult stages of insects

8. Name the branch of Biology that deals with the study of animals

9. State **four** ways in which some Fungi are beneficial to human

10. During a class practical form four students came across a plant whose flower floral parts were in multiples of fours and fives. To which sub-division and class does the plant belong?

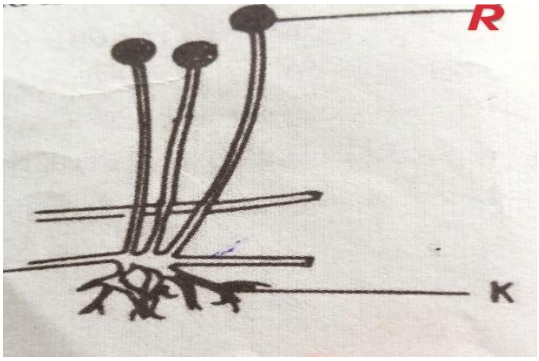
11. A student caught an animal which had the following characteristics:-

- Body divided into two parts
- Simple eyes
- Eight legs

The animal belongs to the class ……

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12. The diagram below represents a bread mould.



(a)(i) Name the Kingdom to which bread mould belongs.

(ii) Give **two** distinguishing characteristics of the Kingdom named in **(a) (i)** above.

(b) State the function of the part labelled **R**

13.(a) What is meant by the term taxonomy?

(b) The scientific name of a rat is Rattus norvegicus

(i) Write the name correctly

(ii) Identify the genus and species names

14. List **three** features that distinguish arthropods from other organisms

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2. THE CELL – STRUCTURE

1. Name the organelles that perform each of the following functions:

a) Digestion and destruction of worn out organelles.

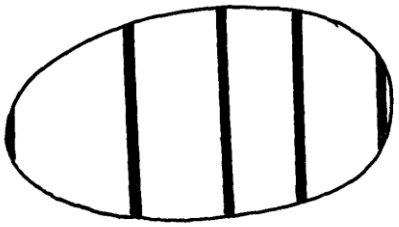
b) Osmoregulation

2. Explain why the following processes are important during the preparation of temporary slides:-

(a) Staining

(b) Use of a sharp cutting blade

3. In a class experiment to establish the size of an onion cell, a leaner observed the following on the microscope field of view.



If the student counted 20 cells across the diameter of this field of view, calculate the size of one cell in micrometers.

4. State the functions of the following cell organelles:

(a) Nucleolus.

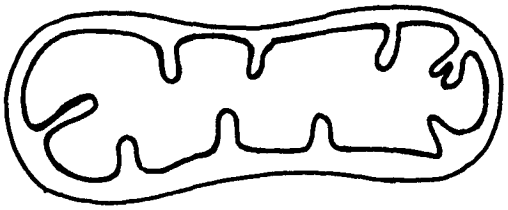
(b) Plasma membrane

5. What is the of nucleus of a cell made up of?

6.(a) In a laboratory exercise a student observing a drop of pond water under a microscope saw and drew a spirogyra. If the magnification of the eye-piece was x5 and that of the objective lens was x100, what was the magnification of the spirogyra?

(b) If the spirogyra has a length of 5cm at the above magnification, calculate the actual length in micrometers

7.(a) Identify the organelle shown below:-



(b) How is the organelle you have identified in **(a)** above suited to its function

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8. Identify the structures of the cells that perform the following functions:-

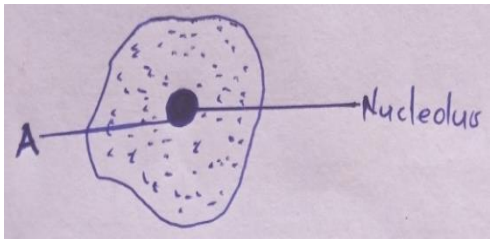
(a) Synthesize ribosomes

(b) Regulate exchange of substances in and out of the nucleus

9.(a) State the roles of enzyme catalase in living cells

(b) Which factor inactivates enzyme?

10. The figure below represents a certain cell organelle:-



(a)(i) Identify the cell organelle

(ii) What is the function of the part labelled **A**

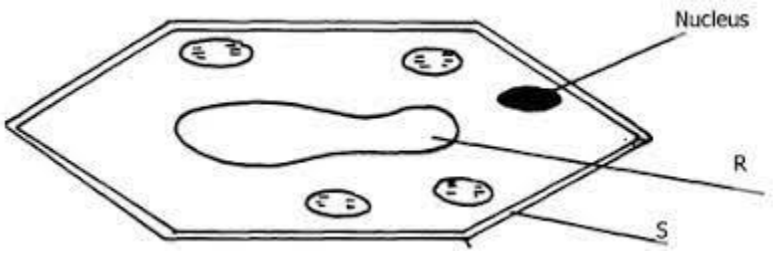
(b) Name the organelles that perform each of the following functions;

(i) Osmoregulation in amoeba

(ii) Carries out digestion and destruction of worn out cell organelles

11. State **three** properties of the cell membrane

12. The diagram below represents a plant cell



(a) Name a carbohydrate which forms part of the structure labelled **S**

(b) State **two** functions of the part labelled **R**

(c) Name **two** structures present in the diagram but absent in the animal cell

13. What do you understand by the following terms

a) Anatomy

b) Biochemistry

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14. State the function of the following parts of a cell

a) Ribosome

b) Chloroplasts

15.a) What is the formula for calculating linear magnification of a specimen when using a hand lens

16. State the function of the following cell structures:-

a) Ribosome ;

b) Centrioles ;

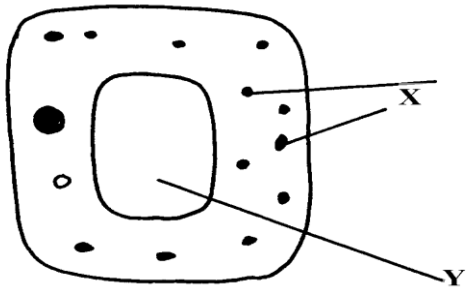
17. What is the main structural component of:-

a) Cell wall

b) Cell membrane

18. State **two** characteristics of the kingdom monera which are prokaryotes

19. The diagram below represents a cell



a) Name parts labelled **X** and **Y**

b) Suggest why the structures labelled **X** would be more on one side than the other

20. During a practical class, form fours estimated the field of view to be 3.5mm. Using the low power objective, they observed spirogyra cells across the same field of view and counted 8cells. Calculate the size of each cell and give your answer in micrometer

21. A student caught an animal which had the following characteristics:-

- Body divided into two parts
- Simple eyes
- Eight legs

a) To what class does the animal belong?

b) State **two** distinctive characteristics of members of the phylum from which the animals in this question (15) belongs

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22. Distinguish between the following terms :-

a) Magnification and resolution of a microscope

b) Mounting and staining of a specimen

23. Name the organelle that performs **each** of the following functions in a cell.

(a) Transport of packaged glycoproteins

(b) Destruction of worn out cell organelles

(c) Synthesis of proteins

24. Why are the following procedures done when preparing sections to be observed under a light microscope?

(a) Making of thin sections

(b) Using a sharp blade to make the sections

(c) Staining

25. What are the functions of the following parts of a light microscope?

(a) Eye piece lens

(b) Condenser

(c) Diaphragm

26. Given that the diameter of the field of view of a light microscope is 2000um. Calculate the size of a cell in mm if 10 cells occupy the diameter of the field of view

27. State the importance of the following processes in microscopy:

(a) staining

(b) sectioning

28. A cell was found to have the following under a light microscope; cell membrane, irregular in shape, and small vacuoles. Identify the type of the cell above

29. State the functions of the following organelles;

(a) Lysosomes

(b) Golgi apparatus

30. Name the class in phylum arthropoda which has the largest number of individuals

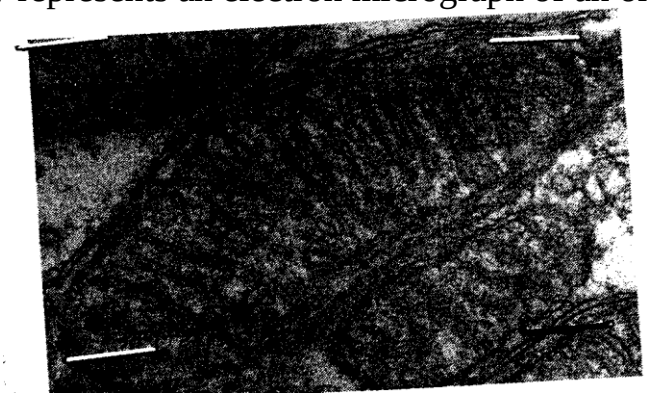
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31. State the functions of each of the following parts in a microscope.

(a) The eye piece lens

(b) The objective lens

32. The figure below represents an electron micrograph of an organelle that is found in many cells;



(a) Identify the organelle
(b) State the function of the organelle
(c) What is the importance of infoldings in the inner membrane.
(d) Give **two** examples of tissues where you would expect many such organelles in animal body.

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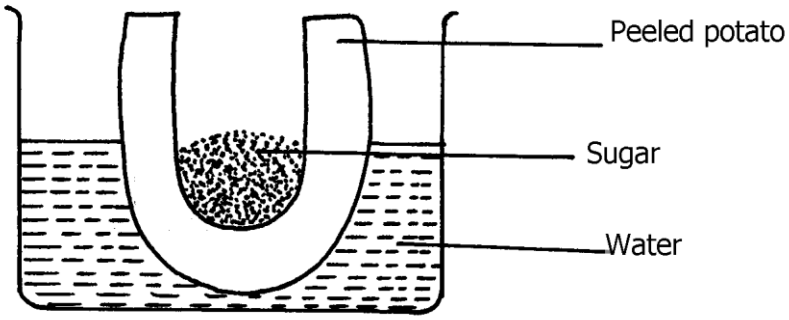
3. CELL PHYSIOLOGY
OSMOSIS, DIFFUSION AND ACTIVE TRANSPORT

1. Two equal strips **A** and **B** were from a potato whose cell was 30% of sugar. The strip **A** was placed in a solution of 10% sugar concentration while **B** was placed in 50% sugar concentration

a) What change was expected in strip **A** and **B**

b) Account for the change in strip **A**

2. An experiment was set-up as shown below and left for one hour



(a) State the expected result at the end of one hour

(b) Explain the observations made in this experiment

3. State what would happen in each of the following:-

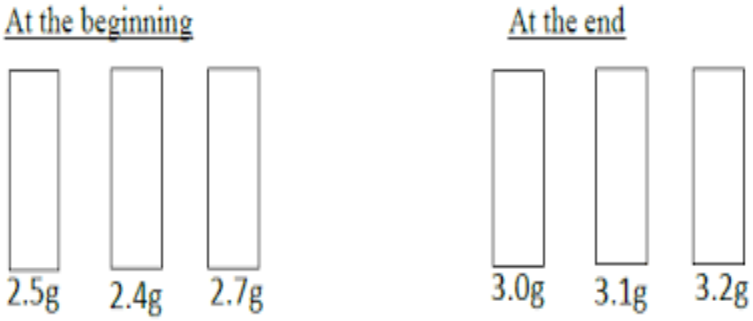
(a) A plant cell placed in: -

(i) Strong salt solution

(ii) Distilled water

4. State **three** physiological processes that are involved in movement of substances a cross the cell membrane

5. Potato cylinders were weighed and kept in distilled water evernight. They were then reweighed.

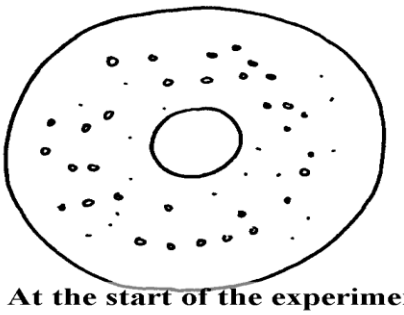


a) Calculate the average mass of a potato cylinders after reweighing. Show your working.

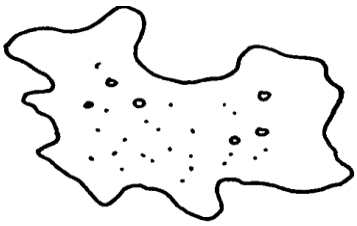
b) Explain why mass of the cylinders hand increased.

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6. The diagrams below show a red blood cell that was subjected to a certain treatment.



At the start of the experiment

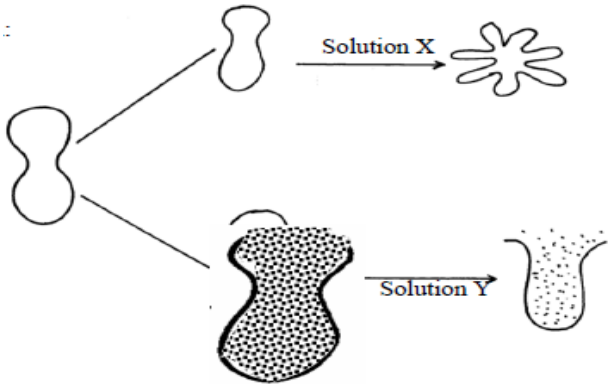


At the end of the experiment

a) Account for the shape of the cell at the end of the experiment.

b) Draw a diagram to illustrate how a plant cell would appear if subjected to the same treatment

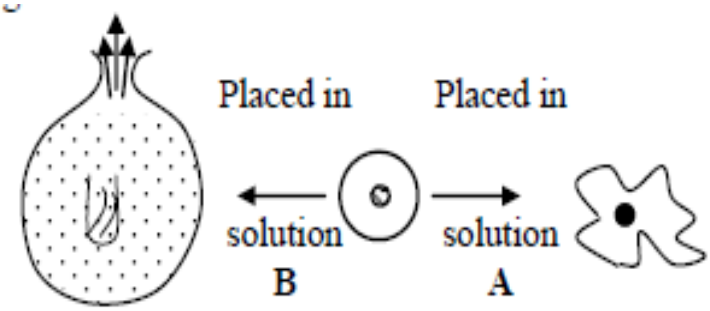
7. The diagram below shows the results obtained when red blood cells are placed in different solution:



(a) What name is given to the process that occurs when the cell is placed in solution **Y**?

(b) Describe the process that would occur in a plant cell when placed in a similar solution as that of solution **X**

8. The figure below shows the results obtained when red blood cells are put in different solutions:-



(a) What is the name given to the process that occurs when the cell is put into solution **B**?

(b) Compare the results obtained when the cell is put in solution **B** to the results that would be obtained if a plant cell was put in the same solution

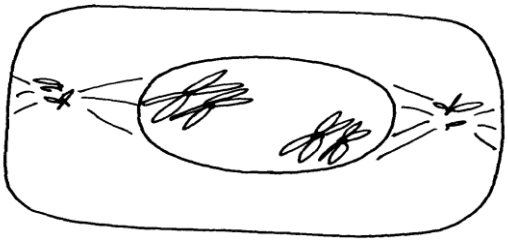
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9. Briefly state **two** adaptation for each of the following cells to their functions

(i) Spermatozoon

(ii) Palisade mesophlly cell

10. The diagram below represents a cell at a certain stage in meiotic cell division



a) Name the stage at which the cell drawn above represents

b) Give a distinguishing reason for your answer in **10(a)** above

c) State any **two** differences between mitosis and meiosis

11. What are **two** differences between tropisms and tactic movement

12. An experiment was carried out to investigate the effect of different concentrations of sodium chloride on human red blood cells. Equal amounts of blood were added to equal volumes of thesalt solution but of different concentrations. The results are shown in the table below:

Set -up		Number of red blood cells	
	Sodium chloride concentration	At start of experiment	At the end of the experiment
A	0.9%	Normal	No change in number
B	0.3%	Normal	Fewer in number

(a) Account for the results in the set-up

(b) If the experiment was repeated using 1.4% sodium chloride solution, state the expected results with reference to:

(i) The number of red blood cells

(ii) The appearance of red blood cells if viewed under the microscope

13. Name support tissues in plants characterized by the following

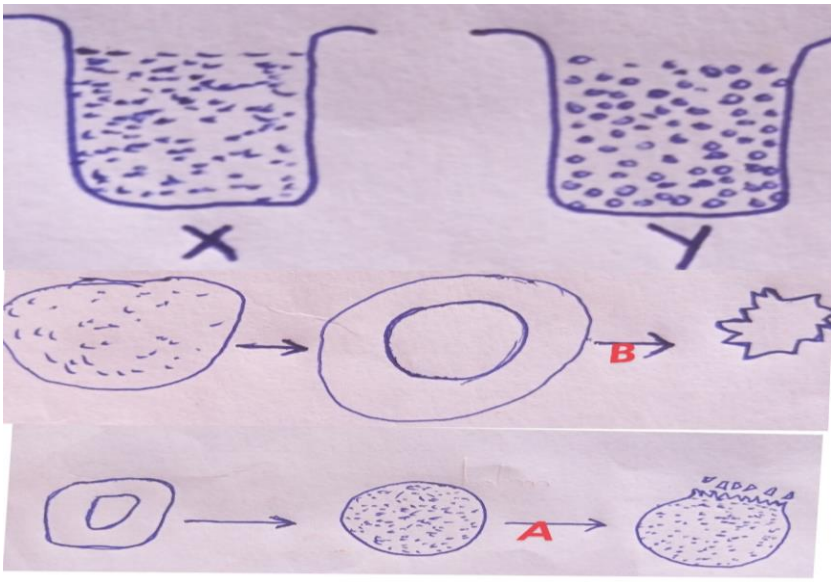
(i) Cells being turgid

(ii) Cells being thickened by cellulose

(iii) Cells being thickened by lignin

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14. The diagram below illustrates the behaviour of red blood cells when placed into two different solutions **X** and **Y**.



(a) Suggest the nature of solutions **X** and **Y**.

(b) Name the process **A** and **B**.

(c) What would happen to normal blood cell if it were placed in a solution isotonic.

15. Name **two** plant processes in which diffusion plays an important role

16. Two fresh potato cylinders of equal length were placed one in distilled water and the other in concentrated sucrose solution:

(a) Account for the change in length of the cylinder in:

(i) Distilled water

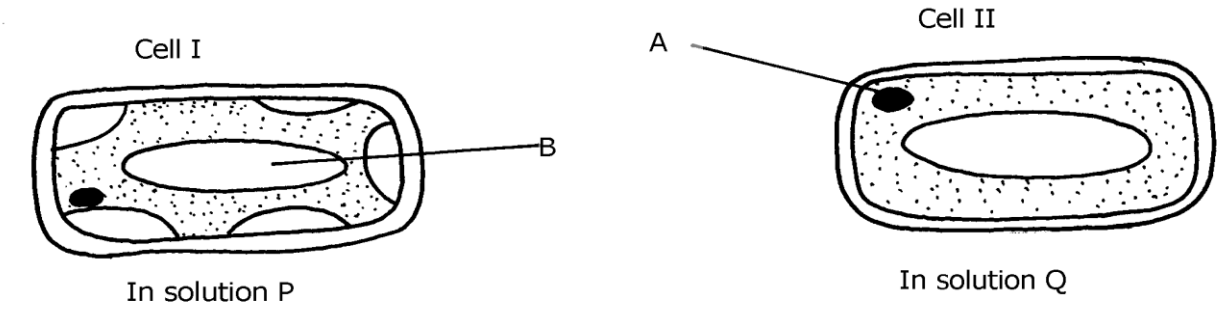
(ii) Sucrose solution

(b) (i) What would be the result in terms of length if a boiled potato was used?

(ii) Explain your answer in**(b)(i)** Above

(c) State **two** uses of the physiological process being demonstrated in the experiment

17. The two cells shown below are obtained from two different potato cylinders which were immersed in two different solutions **P** and **Q.**



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a)i) Name the structure labelled **A**.

ii) State the function of structure B.

b) If eight of cell I were observed across the diameter of the filed of view of 0.5 mm. Work out the actual diameters of each cell in micrometers.

c) Suggest the identity of the solution Q.

d) Account for the change in cell I above.

e) State any **one** importance of the physiological process being demonstrated above in animals.

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4. NUTRITION IN PLANTS & ANIMALS

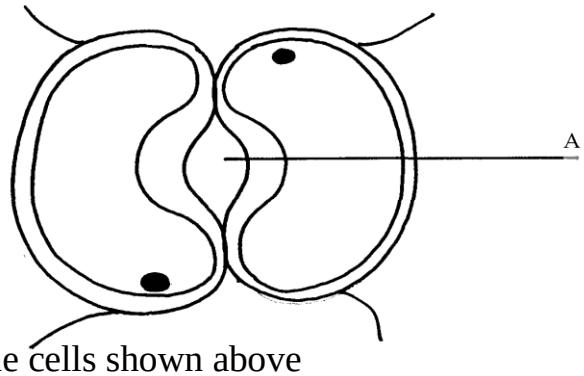
1. The chemical equation below represents a physiological process that takes place in living organisms:

$$C_6H_{12}O_6 + C_6H_{12}O_6 \xrightarrow{R} C_{12}H_{22}O_{11} + \mathbf{Q}$$

(a) Name the process **R**

(b) Name the substance **Q**

2. The diagram below shows cells in plants:-



(a) Identify the cells shown above

(b) Explain how the cells are adapted to their function

(c) Explain how accumulation of carbon (IV) Oxide in the cells above would lead to the closure of structure **A**

3. (a) A leaf of a potted plant kept in darkness for 48hours was smeared with Vaseline jelly then exposed to sunlight for 8hours. Explain why the test for starch in the leaf was negative

(b) Name **two** other processes that were interfered with in the plant

4. List **two** functional differences between plants and animals.

5. Explain how the guard cells are adapted to perform their function.

6. State the function of iron in the human body

7. What are the **two** functions of bile salts during the process of digestion?

8. State **three** adaptations of aquatic plants to photosynthesis

9. A biological washing detergent contains enzymes which remove stains like mucus and oils from clothes which are soaked in water with the detergent:-

(a) Name **two** groups of enzymes that are present in detergent

(b) Explain why stains would be removed faster with the detergent in water at 35°C rather than at 15°C

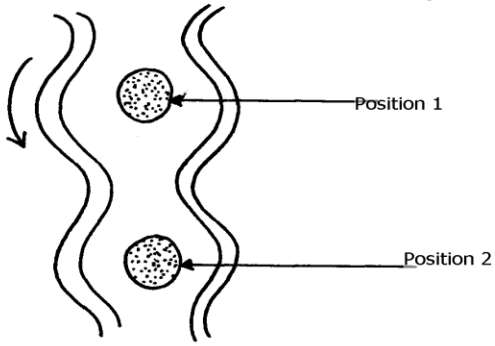
10. Name the diseases caused by deficiency of **: (a)** Iodine

(b) Vitamin C

11. Name **two** enzymes and **one** metal ion that are needed in the blood clotting process

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12. The diagram below shows how food boles move along the human oesophogus and the Intestine



(a) Identify the process illustrated in the diagram

(b) Briefly **state** how the movement of food boles from position 1 to position 2 is achieved

(c) Name **one** component of a persons diet that assists in the movement of food described in (b) above

13. State **two** adaptations of herbivores which enable them to digest cellulose

14. State **two** factors that affect the rate of osmosis

15. A certain organ **K** was surgically removed from a rat, later drastic increase in glucose level in the blood was reported but when substance **Q** was injected into the animal the whole process was reversed.

Identify: **(i)** Organ **K**

(ii) Substance **Q**

16. a) Name the component of a persons diet that is essential for peristalisis

b) Give **two** groups of food which are reabsorbed along the mammalion digestive system without undergoing digestion

17. State **three** roles of light in photosynthesis

18. State **two** ways in which the guard cells differ their adjacent epidermal cells

19. One of the components of bile is a chemical left over from destruction of red blood cells

i) Identify the chemical substance

ii) What is the role of bile in digestion

20.(a) What is peristalsis?

(b) Explain how the process above is brought about.

21. The following reaction may occur in a forward and backward direction.

Water + Carbon (IV) Oxide $\longrightarrow$ Glucose + Oxygen + Energy

(a) Name the organelle where the reaction occurs in:

(i) Forward direction

(ii) Backward direction

(b) Give **one difference** and **one similarity** for the two organelles named in **(a)** above

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22. A solution of sugar cane was boiled with hydrochloric acid and sodium hydrogen carbonate was added to the solution, which was then boiled with benedicts solution. An orange precipitate was formed.

(a) Why was the solution boiled with hydrochloric acid and then sodium hydrogen carbonate added in it

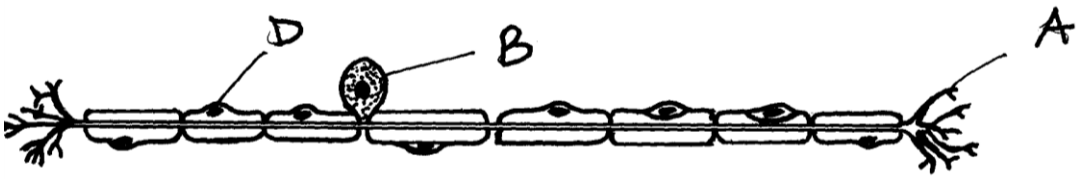
(b) To which class of carbohydrates does sugar cane belong?

(c) State the form in which carbohydrates are:

(i) Transported in animals

(ii) Transported in plants

23. The diagram below is of a certain type of neurons



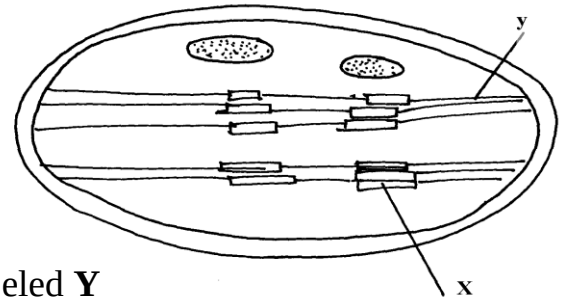
(a) Identify the type of neuron

(b) Give a reason for your answer in **(a)** above

(c) Give the functions of the parts labeled **A, B**, and **D**

24.a) The mitochondria organelle has cristae structure on the inner membrane. State the function of the cristae

b) The diagram below represents a cell organelle



i) Name the part labeled **Y**

ii) State the function of the part labeled **X**

25.a) State the role of emulsification in the digestion of fats in the alimentary canal

b) What is the function of hydrochloric acid in the alimentary canal

26. Briefly explain the effect of poisoning the roots hair on the uptake of nitrate by plants

27. Briefly explain the symbiotic relationship in the root nodule of a leguminous plant

28. Explain how saliva is important in digestion

29. What is the fate of excess glucose in plants?

30. State **two** ways in which guard cells differ from other epidermal cells

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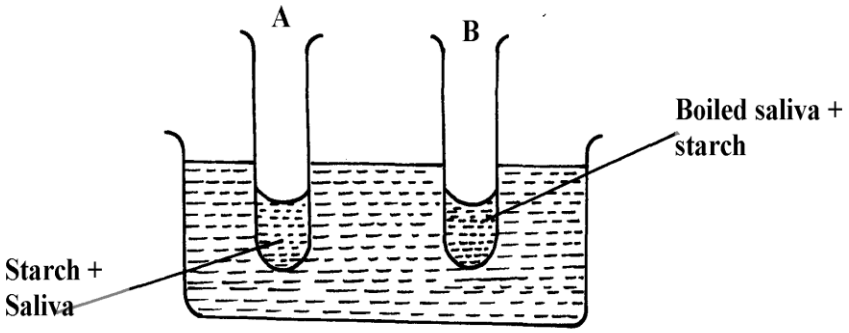
31. Briefly explain the fate of the following products from the light stage of the process of Photosynthesis:

(a) Oxygen

(b) Hydrogen

(c) ATP

32. In an experiment to investigate on aspect of digestion, two test tubes A and B were set-up as shown in the diagram below;



The test tubes were left in the bath for 30 minutes.The content of each test tube was then tested for starch using iodine solution:-

(a) What was the aim of the experiment?

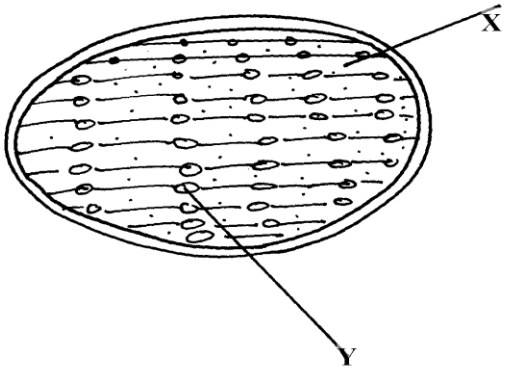
(b) What results were expected in test-tube **A** and **B**

(c) Account of the results you have given in **(b)** above in test tube **A** and **B**

33.[a] Name one salivary gland in humans

[b] State two functions of saliva

34. The diagram below represents a cell organelle



(i) Name the part labeled **y**

(ii) State the function of the part labeled **X**

(iii) State the function of the vitamin named in (**i**) above

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36.(a) Name the disease caused by **schistosoma** parasites in man.

(b) How is **schistosome** adapted to its parasitic mode of life?

37. The table below shows **three** enzymes **A, B** and **C** and their respective optimum pH.

Enzyme	Optimum pH
A	6.8
B	2.0
C	8.0

(a) (i) Name the most likely region of the alimentary canal of a mammal where enzyme **B** would be found.

(ii) Give a reason for your answer in (a) (i) above

38.[a] state two factors that affect enzymatic activities

[b] Explain how one of the factors stated in [a] above affects enzymatic activities

39.(a) Name the specific part of the chloroplast where the following processes occur.

(i) Carbon IV oxide fixation

(ii) Photolysis

(b) State **one** way in which the dark reactions of photosynthesis depends on light reaction.

40. The diagram below shows a human tooth



[a] Identify the tooth

[b] How is the tooth adapted to its function?

[c] State the role of the following vitamins in the human body

[i]C **[ii]**K

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41. State **three** ways by which the rate of enzyme controlled reactions can be increased.

42. Study the dental formula given below:

$$\mathbf{I}\ \frac{\mathbf{0}}{\mathbf{4}};\ \mathbf{C}\ \frac{\mathbf{0}}{\mathbf{0}};\ \mathbf{PM}\ \frac{\mathbf{3}}{\mathbf{3}};\ \mathbf{M}\ \frac{\mathbf{2}}{\mathbf{3}}$$

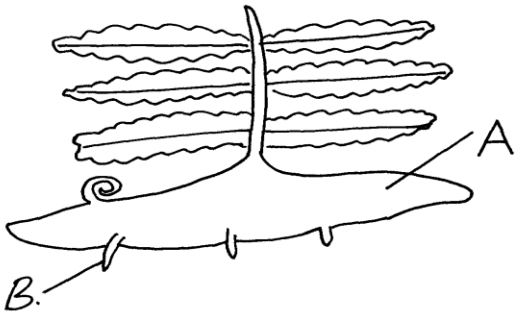
(a) Identify with reasons the mode of feeding of the animals whose dental formula is given above

(b) Calculate the total number of teeth in the mouth of the above animal

43. Explain why small mammals such as moles feed more frequently than larger ones such as elephants

44. State **three** ways by which plants compensate for lack of the ability to move from one place to another

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



(a) Label the parts **A** and **B**

(b) State **one** observable difference between the structure above and the liverwort

46. What is glycolysis?

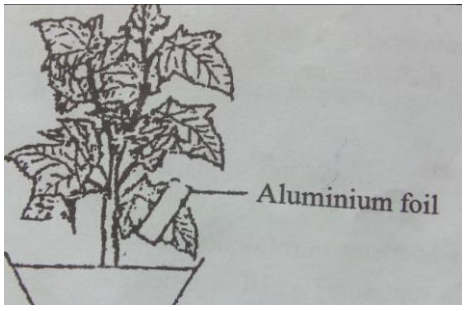
47. (a) State **two** difference between monosaccharide and polysaccharides

(b) Name the bond found in proteins

48. Name t**wo** products of light reaction used in the dark reaction

49. State **two** functions of the large intestine in humans.

50. The diagram below shows a leaf of a growing plant partly covered with aluminium foil. The plant was placed in the sun from morning to midday and then tested for starch.

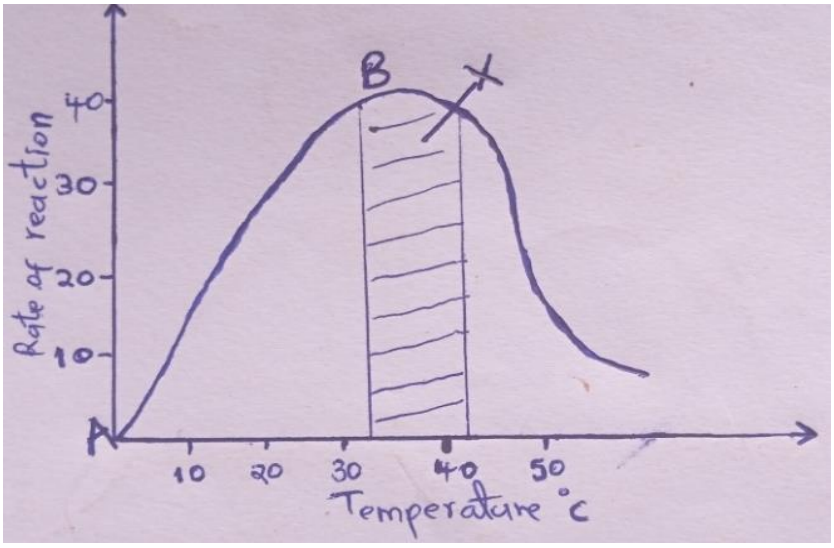


(a) What was the aim of the experiment?

(b) State the observation made when the leaf was tested for starch

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51. The figure shows the effect of temperature on an enzyme catalyzed reaction.



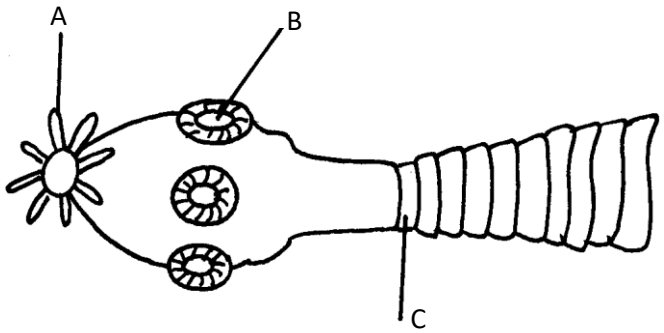
(a) Explain what happens between **A** and **B**

(b) What is **X**?

52. Name **two** mineral elements that are necessary in the synthesis of chlorophyll.

53. The figure below is a diagram of the anterior portion of the tapeworm.

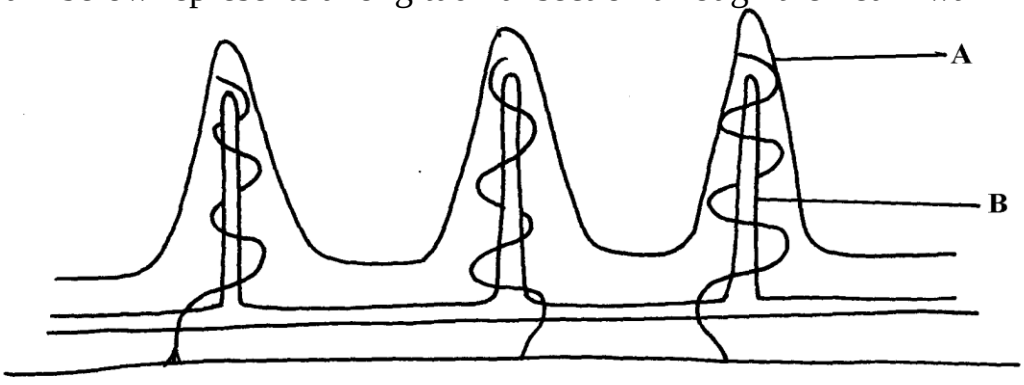
Taenia solium.



(a) Name the parts labeled **A, B**, and **C**

(b) What is the intermediate host of Taenia Solium?

54. The diagram below represents a longitudinal section through the ileum wall



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a) Identify the structure labeled **A** and **B**

b) State **one** function of **A** and **B**

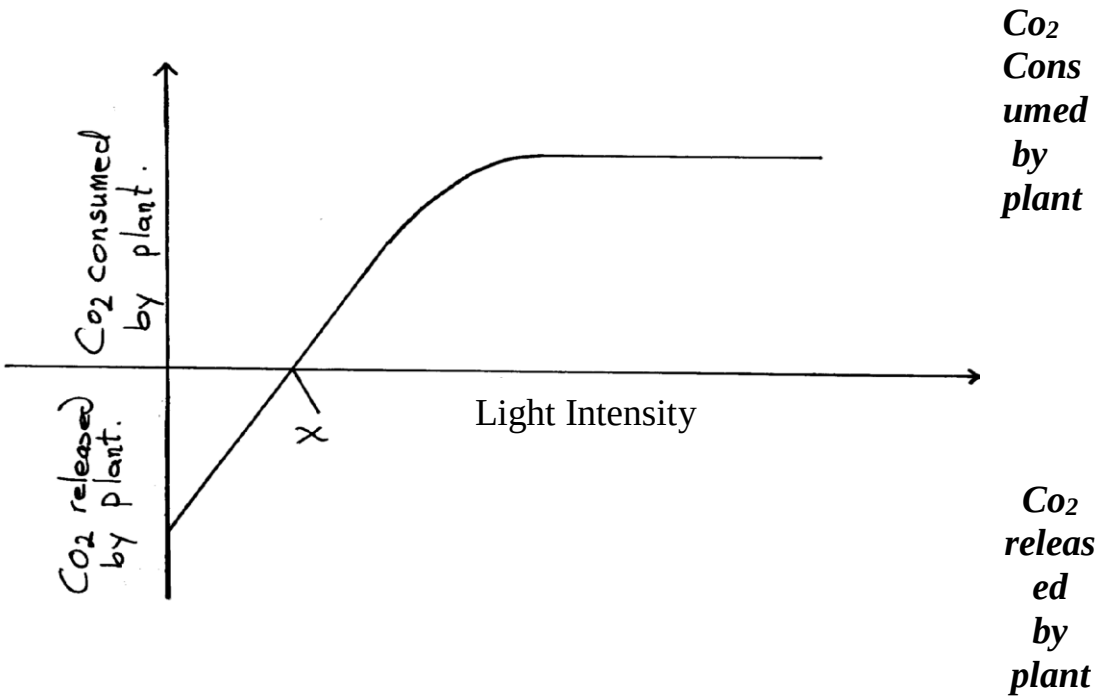
c) State **two** functions of the ileum

d) Explain the role of the liver in digestion

e) State the endocrine role of the pancreas in a mammal

55 Briefly describe the reactions during the light stage of photosynthesis

56. The diagram below shows the effect of varying light intensity on the exchange of carbon IV oxide between the leaves of a green plant and the atmosphere.



a) What is the name given to the point marked x?

b) i) With reference to carbon IV oxide exchange state what happens at point **x**.

ii) Explain how the effect observed at point x occurs.

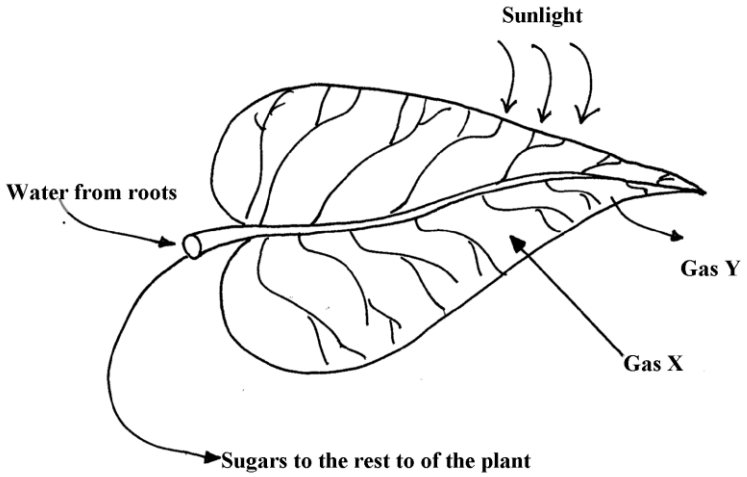
c) Explain why there is a net uptake of carbon IV oxide at light intensity above **x**.

d) What would happen to the plant if light intensity falling on it were maintained at **x** throughout?

e) What can you say about the exchange of oxygen between the plant and the surrounding air at intensities below **x**?

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57. The following diagram of a leaf shows what happens in a pant leaf during photosynthesis:-



(a) Give **two** ways in which leaves are adapted to absorb light

(b) Name the gases labelled **X** and **Y**

(c) Name the tissue that transports water into the leaf and sugars out of the leaf

(d) Explain why it's an advantage for the plant to store carbohydrates as starch rather than as sugars

58.(a) What is meant by digestion?

(b) Describe how mammalian small intestine is adapted to its function

59. [a] The action of ptyalin stops in the stomach.Explain

[b] State a factor that denatures enzymes

[c] Name the features that increase the surface area of small intestines

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