

SENGEREMA HIGH SCHOOL

FORM FIVE REVISION HOLIDAY PACKAGE

A. CYTOLOGY AND BIOCHEMISTRY

- (a) Draw a structure of chloroplast and label any six parts.
(b) State three structural adaptations shown by the chloroplast to its role.
- a) Why is it advantageous for a cell to be small in size?
b) Briefly describe four (4) factors affecting the rate of diffusion of materials across a cell membrane.
- c) Describe the structure of the columnar epithelium of the digestive system of a man, showing how it is related to its digestive roles.
- (a) Study Figure 2 and answer the questions which follow.

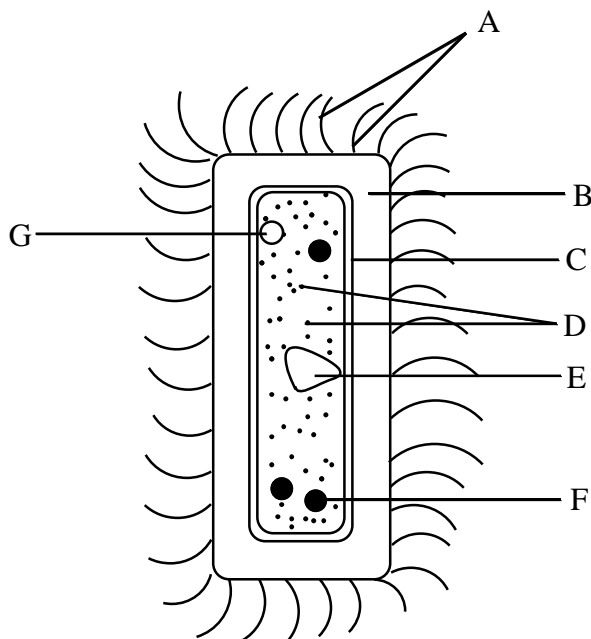
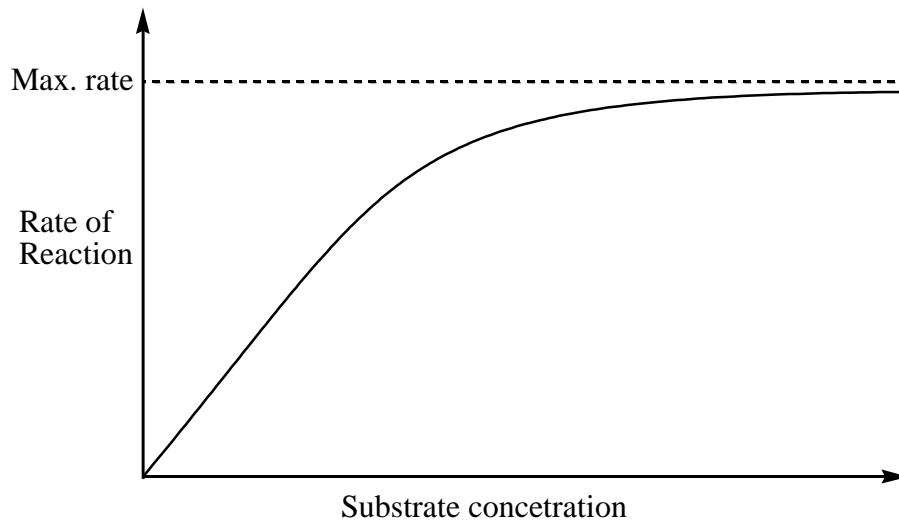
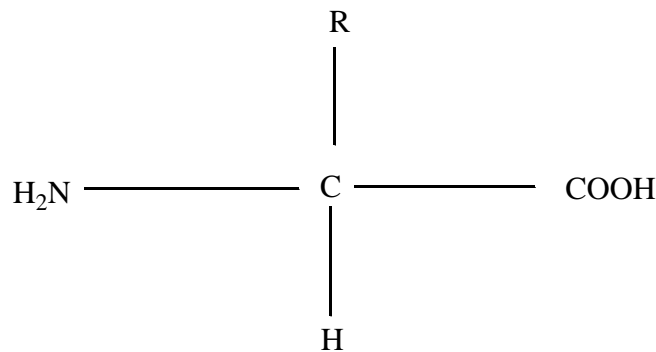


figure 2

- Identify the cell.
 - Name the parts labelled A, B, C, D, E, F and G.
- (b) Outline five differences between in 9(a) above and a trypanosome cell?
- (a) Draw the structure of animal cell as seen under electron microscope.
(b) (i) Name a double membrane organelle found in plant cells only.
(ii) How is the organelle adapted to its role?
 - (a) The graph below shows the effect of substrate concentration on the rate of an enzyme controlled reaction.



- i. Give a reasoned interpretation of the graph.
 - ii. How can rate of reaction be increased?
 - (b) What is the commercial important of cellulose?
7. (a) Name the chemical composition of proteins.
 (b) Explain six categories of protein based on their functions
8. Study the molecular formula below and answer questions that follow.



- a) (i) What is the general name given to the molecular formula above?
 (ii) What is the simplest form of R?
 - b) State six properties of enzymes.
9. i) What is exocrine gland?
 ii) Explain how exocrine gland works?
 iii) Give one example of exocrine gland?
- (b) i) Explain how nervous system and hormonal coordination interact?
 ii) Mention seven (7) hormones secreted by anterior lobe of pituitary gland
10. (a) Study Figure 1 and answer questions which follow.

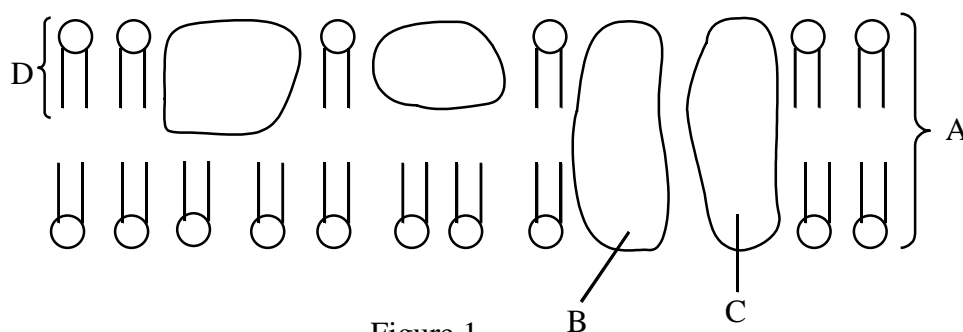
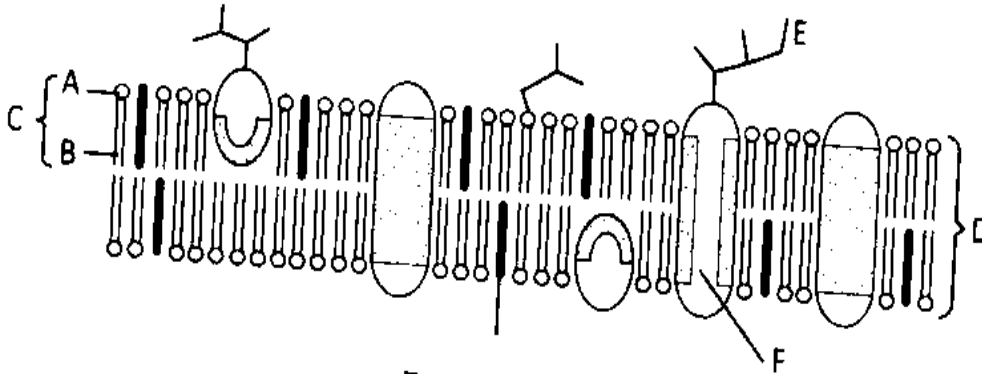


Figure 1

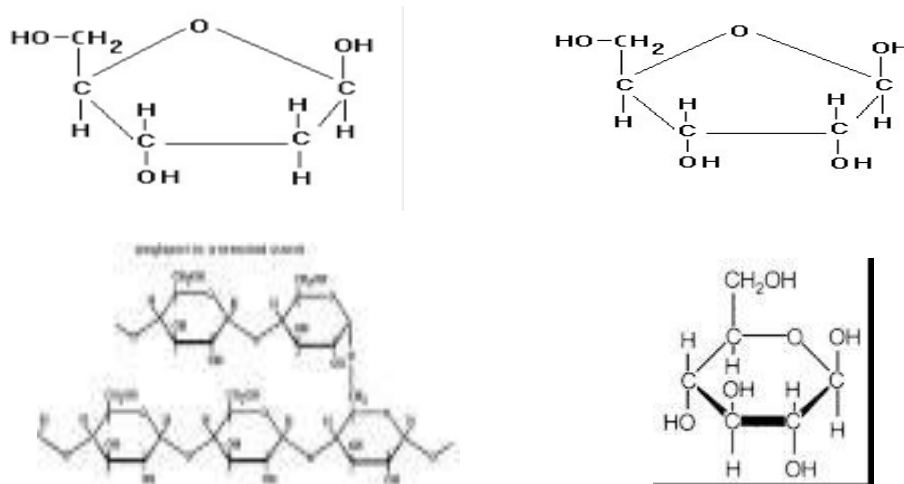
- i. What structure does Figure 1 represent?

- ii. Identify the parts labelled A, B, C and D.
 - iii. State four functions of the structure labelled B
- (b) Describe three functions of microtubules
11. The figure below is a diagram of the fluid mosaic model of the cell membrane, study the figure carefully and then answer the question that follow



- a) Name the structures represented by the labels A, B, C D and G.
 - b) Name the biochemical substances formed when E and F combine
 - c) What roles does the structure F play in the function of the membranes?
 - d) Mention only two (2) importance of the substance D to the cell membrane.
12. (a) (i) Briefly explain how to test protein in a given solution using Biuret test
(ii) What is the basis of protein test?
- (b) Explain how each of the following factors cause protein denaturation.
- i. Heat
 - ii. Acid
 - iii. Alkaline
 - iv. Mechanical force

13. The following diagrams represent the structure of some common carbohydrates:



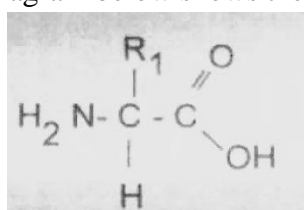
- i. Suggest a suitable name for each structure, A – D
- ii. Given the chemical formula for hexose sugar is $C_6H_{12}O_6$; write down the structural formula equation to show the synthesis of the disaccharide called maltose.

iii. Briefly explain how you could distinguish, using a practical technique, between the presence of a reducing sugar, such as glucose and a non-reducing sugar, such as sucrose.

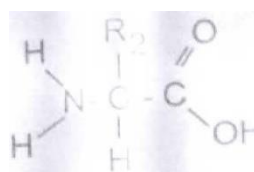
b. Draw a labeled diagram of a plant cell as seen under electron microscope indicate, using Letters below the cellular structures concerned with:

- A. Cellular respiration
- B. Protein synthesis
- C. photosynthesis
- D. Transport and modification of cellular proteins and lipids
- E. Transport and provision of surface area for lipid and steroid synthesis
- F. Transport of cellular proteins
- G. Control exchange of materials between cells
- H. Controls cells division

14. The diagram below shows the structures of two amino acids A and B.



Amino acid A.



Amino Acid B.

(a) (i) Give one element other than carbon, hydrogen and oxygen which could be present in the side group R₁ and R₂.

(ii) A and B can be linked together during protein synthesis. What is the name given to this bond?

(iii) Copy the diagram and put a ring around the atoms which are removed when A and B are joined together.

(iv) Draw a line connecting the atoms in A and B which are bonded

(b) Copy and complete the table below giving a named example of a protein having the function indicated.

| Function | Example of Protein |
|-------------------------|--------------------|
| Contractile | |
| Enzyme | |
| Transport | |
| Structural | |
| Hormone | |
| Protection from disease | |

15. (a) Define the term “Biochemistry” and suggest its importance

(b) State significance of the following sugars

(i) Trioses

(ii) pentoses

16. (a) With the help of diagram(s) describe the structure of the cell surface membranes.

(b) State two (2) functions of each of the following components of the cell surface membrane.

- (i) Proteins
- (ii) Phospholipids
- (iii) Glycolipids
- (iv) Carbohydrate

17. The cells are always restrained from growing bigger so as to maintain a certain range of Surface-Volume ratio which can efficiently support diffusion, this physical explanation for the limitation in cell size is called the Surface-Volume Hypothesis, however some cells have developed ways of overcoming the surface-volume obstacle by different ways. Explain any of these three (3) ways.

18. Describe the following terms;

- i. Endocytosis
- ii. Facilitated diffusion
- iii. Endosymbiotic
- iv. Amylopectin
- v. Peroxisomes

B. CLASSIFICATION AND NATURAL GROUPS

19. a) Write short notes on the following:

- i. taxonomy
- ii. systematic
- iii. identification

b) Compare the life cycle of a fern with that of a moss

20. (a) Explain what you understand by the following terms.

- i. Taxonomy
- ii. Classification
- iii. Nomenclature
- iv. Systematics

(b) In which kingdom are viruses classified? Give reasons for your answer.

21. a) Write a brief account of ;

- i. Chemosynthetic bacteria
- ii. Symbiotic bacteria
- iii. Parasitic bacteria
- iv. Saprophytic bacteria

b) Why are blue green algae included under monera and not under kingdom plantae?

c) Fungi are the contributor to the plant nutrient circulation. Discuss.

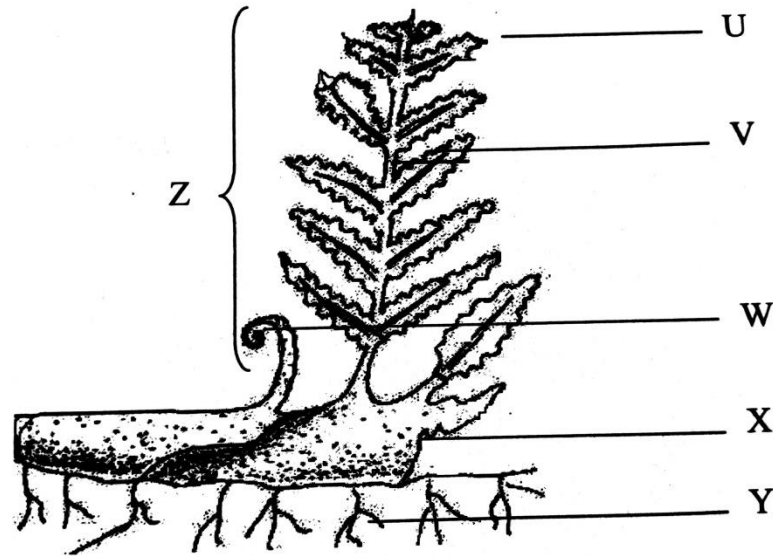
22. (a) Why natural system of classification is certainly better than any artificial system of classification?

- (b) (i) Define the term taxon
- (ii) Classify yourself to the lowest classification taxon.

23. Identify:

- a) Steps used to construct simple taxonomic keys.
- b) Rules used in binomial nomenclature.

24. (a) What is meant by natural system of classification?
 (b) Why is it difficult to achieve a complete natural system of classification?
25. (a) Study Figure 3 and answer questions which follow.



- i. Name the organism
 - ii. Classify the organism to division level
 - iii. Explain four general and three distinctive features of the kingdom to which the organism belongs.
- (b) (i) Identify the parts labeled U, V, W, X, Y and Z.
 (ii) State three roles played by the part labeled Y.
 (iii) Give five ways in which the organism structurally adapts to its mode of life
26. (a) Viruses exhibit dual nature. Discuss.
 (b) In what ways are viruses important to humans?
27. Describe the life cycle of a named parasitic protozoan (Apicomplexa) and its adaptations to its mode of life.
28. (a) What is an indirect life cycle?
 (b) Draw a well-labeled life cycle of malaria.
 (c) In what ways are viruses important to man?
29. (a) Bryophytes are the amphibians of the plant kingdom (comment upon the statement).
 (b) Describe the structure and significance of the following:
 - i. Capsule in mosses
 - ii. Sorus in ferns
- (c) State the reproductive adaptations of Dryopteris to its mode of life.
 (d) What are the main respects in mosses, liverworts and ferns to be poorly adapted to land life?
 (e) State the distinctive feature(s) of organisms belonging to the following phyla:
 - i. Euglenophyta
 - ii. Chlorophyta
 - iii. Zoomastigina
- (f) Describe the determinants of Amoeba's shape in a given environment.

30. (a) How different are the respiration in fishes and the respiration in adult amphibians?
(b) (i) Describe the distinctive feature of *Phytophthora*?
(ii) Explain the adaptation of *Phytophthora* to its mode of life?
31. (a) Discuss the ways in which reptiles are better adapted to life on land than amphibians
(b) Contrast the structure of a tapeworm and annelid.
(c) Explain why fern are considered to be more advanced than mosses.
32. (a) State the lowest classification taxon at which a cobra and a human are grouped together. Give reasons to support your answer.
(b) (i) Draw a well labelled diagram of *Euglena* and explain how it resembles both an plants and animals.
(ii) In which kingdom an organism in (b) (i) above belong; give the reasons to your answer.
33. (a) Write an account of the features which have made arthropods the most successful group of the animal kingdom.
(b) Account for the differences between the skeleton of arthropods and that of mammals.
(c) What characteristics features do fish and mammals have in common?
34. Using examples, explain five advantages and disadvantages of Kingdom Fungi to human being.
35. (a) Draw a diagram of a bacteriophage and label six parts.
(b) Viruses pose problem in identification as they possess characteristics of both living and non-living things. Justify this statement by stating four living and three non-living characteristics of the viruses