

ELCT DIOCISE OF MERU
AILANGA LUTHERAN JUNIOR SEMINARY
FORM FIVE HOME PACKAGE-2020

1.a) Why cells are small?

b) The function of each cell organelle is vital to the survival of cell. Describe what would happen to the cell if the following organelles were faulty or absent.

- i. Lysosome
- ii. Cytoskeleton
- iii. Peroxisome
- iv. Mitochondria

c)'Nerve cell are similar to other cells in the human body'

With examples, make comparison between nerve cell and other cells in the human body.

2.a) Describe three ways in which molecular structure of cellulose and starch differs

b) Explain why the enzyme that catalyze the hydrolysis of starch, will not catalyze hydrolysis of cellulose?

c)Using examples in each case, describe five functions of carbohydrates in organisms

3.a) Briefly explain five properties of receptors they have in common

b) i) Give two reasons why there is sudden influx of sodium ions into the axon following on increase in sodium ion permeability of the axon?

ii)What is refractory period??explain two importance of refractory period

4.a) Explain roles performed by epithelial tissues in digestive system of mammal (at least five roles)

b) i) Which type of chloroplast is specialized for light dependent reaction and which for light independent reaction?

ii) The malate shunt is in effect, a carbon dioxide pump and hydrogen pump. What is its advantage?

5.a) Giving two examples, define the term taxon.

b) Study the three organisms illustrated in figure 1 and then answer the questions that follows

A=EARTHWORM B=FERN C=TICK (FIGURES)

i)Refer to organisms A, B and C in figure 1 and then copy and complete table 1 bellow by filling in the blank slots

organisms	kingdom	Division/phylum	Class
A	Animalia		
B		Bryophyte	
C			Insect

ii)State two important structures lacking in A but typical of the the phylum to which C belongs.

iii)Suggest why A does not need the structures mentioned in 5,b,ii above.

6.a) What are differences between stomata and hydathodes?

b) In which vascular tissues does translocation takes place? Give evidence

c)Define, state the location and give the functions of casparian strip

7.a) Briefly explain why is not possible to suffocate a locust or grasshopper by holding its head under water while the remaining part of the body is outside the water? (2mk)

b) Distinguish between terms breathing and gaseous exchange(2mk)

c)Explain the adaptations of the lungs to gaseous exchange(4mk)

d)Name the enzymes which involved in preparatory phase of glycolysis. (2mk)

8.a) How spermatozoa differ from ovum? Show five differences(5mk)

b) Show ways in which pollen grain is suited to its function (5mk)

c) Describe five roles performed by placenta (5mk)

9.a) Explain why people visiting high altitude from low altitude normally suffer from the height phobia or acrophobia while indigenous people don't experience it? (5mk)

b)i) Describe the meaning of Basal metabolic rate (2mk)

ii) Explain factors affecting basal metabolic rate (4mk)

c) Explain the process which pyruvate undergoes before it enters into Krebs cycle (4mk)

10.a) What is meant by mass flow? explain the importance of mass flow in transporting substances inside organisms

b) Suggest what effect increasing concentration of carbon dioxide in the blood would have on the loading and unloading tensions of human hemoglobin. Give reasons for your answers

c) What sort of organisms require a transport system, and why? Support your answer with examples.

11.a) State the lowest taxon in which crocodile and human are placed together. Give reasons

b) Some biologists propose viruses to be living. What are their arguments?

c) Briefly explain at least five economic importance of bacteria

12.a) State five theories of origin of life

b) Describe the three observations and two deductions used by Charles Darwin to state his theory of organic evolution

13.a) Write down the pathways taken by urea from the organ it is formed to the organ it is excreted

b) Draw an Ornithine cycle and explain the mechanism of urea formation in mammals

14.(a)(i) Define the term seed viability and seed dormancy

ii) State the causes of primary seed dormancy and secondary seed dormancy

b) Describe the prophase stage of cellular mitotic division.

15. (a) A group of Scientists carried out an experiment and found that few human enzymes have low PH optima, about 2 to 3. Where in the body do you think these enzymes are located and why?

(b) Name two enzymes found in the part of the body you have identified in (a)

(c) Enzymes are highly specific in their reactions they promote. What is a disadvantage of such specificity?

16.(a) Explain why our night vision is mostly in black and white rather than color.

(b) How the DNA molecule is adapted to carry out its functions?

(c) If 19.9% of the base pairs in human DNA are guanine, what percentage of human DNA is thymine? Show your reasoning.

17. (a) State which of the following are examples of Catabolism and which of Anabolism:

- (i) Oxidation of carbohydrates
- (ii) Digestion of proteins
- (iii) Production of starch from glucose
- (iv) Deamination of protein Catabolism
- (v) Protein formation from amino acids
- (vi) Photosynthesis
- (vii) Anaerobic respiration

(b) A piece of thread was tied tightly around an animal's pancreatic duct. The animal subsequently had difficulty in digestion of food but did not get diabetes. Explain.

18. (a) Going for a vigorous swim or running after eating a meal causes indigestion than cramping of the muscles. Explain

(b) Arrange the following parts of respiratory system into the order encountered by an inhaled breath of air: trachea, pharynx, bronchus, alveolus, bronchioles, larynx, nasal cavity.

19. (a) Contrast cohesion and adhesion.

Cohesion is the force of attraction or sticking together of identical water molecules in the case of xylem sap (**1½ Mark**).

1½ Mark).

(b) Describe the role of each in the ascent of xylem sap.

(c) Why a donkey and a horse are described as different species?

20.(a) List four different kinds of lipids and briefly describe their functions.

(b) Explain why heating, changes in PH, and other environmental changes can interfere with the function of proteins.

(c) When lysosomes were first discovered, they were sometimes called "**Suicide Capsules**". In what way does that nickname fit?

21.(a) State the reasons as to why ammonia is safe as the main nitrogenous waste for most aquatic animals?

(b) Explain how guard cells limit water loss from a plant on hot, dry day.

(c) How does a foetal hemoglobin enhance oxygen transfer from the mother to fetus across the placenta?

22. A food manufacturer has been advertising a New Cake mix as fat-free. Inspectors from TFDA are testing the product to verify if it lacks fat. Hydrolysis of this cake mix produced glucose, fructose, glycerol, a number of amino acids and several types of molecules with long hydrocarbon chains. Further analysis showed that most of the hydrocarbon chains have a carboxyl group at the one end. What would you tell the food manufacturer if you were the spokesperson for TFDA about the product?

23. (a) In what way is the production of disaccharide similar to the production of a dipeptide?

(b) What advantage does a eukaryotic cell gain by having a nuclear envelope?

(c) Define the lowest taxon in taxonomic hierarchy?

(d) Explain what is meant by the terms

(i) ACTION SPECTRUM OF PHOTOSYNTHESIS.

(ii) How does the Action Spectrum of photosynthesis show us?

photosynthesis **(2 Marks)**.

(iii) Use a diagram to explain your answer.