

ALL THIS YEAR BIOLOGY

RUMMERS FROM CHITIPA TO SANJE

Many thanks to my madam rita, brother John , my mom, and Law-rent , Management of CHIPASULA sec.school and all my lovely online students across malawi



SIR GODFREY MADAM RITA

FROM FROM EGYPT

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Q 1. YOU ARE PROVIDED WITH SPECIMEN X (SISAL). Use it to answer the questions that follow.

- Draw the specimen and label any three parts. (4 marks)
- Calculate the magnification of your drawing. (3 marks)
- Give two adaptations that enable the plant to live in dry conditions. (2 marks)
- If the magnification of the specimen $\times 2$ and the length of the specimen is 10cm. find the length of the drawing (3 marks).
- To which group of the flowering plants do specimen X belong. (2 marks)
- Give any two product made from the sisal. (3 marks)

Q 2. YOU ARE PROVIDED WITH SPECIMEN X (FEATHER). Use it to answer the questions that follow.

- Make a biological drawing of the specimen and label any 2 parts.
- Measure the longest axis of the specimen.
- Calculate the magnification of the drawing.
- Flapping is one of the flight movements in bird. Explain how flapping is achieved.
- Explain how the specimen is adapted to its function.
- Give two forces that a bird encounters during flight.
- Explain how a bird overcomes each type of force mentioned above.
- Describe the mechanism of flight in bird.
- Briefly describe the upstroke during the locomotion of the birds.

Q 3. YOU ARE PROVIDED WITH SPECIMEN X (BEAN SEED). Use it to answer the questions that follow.

- Make a biological drawing of the specimen **X** and label any two parts.
- Measure the longest axis of the specimen.
- Calculate the magnification of the drawing.
- What main food nutrient can you obtain from specimen **X**.
- What disease can be caused by lacking the food nutrients mentioned above.
- Explain how the disease mentioned above can be prevented.
- Explain how you can test the specimen for protein.

Q 4. YOU ARE PROVIDED WITH 10 BEAN SEEDS.

- a. Measure the length of each bean seed and record the length in the table.

| BEAN NO. | LENGTH (cm) |
|----------|-------------|
| | |

- b. Calculate the mean length.
c. What is the type of variation in the length of the bean seeds.
d. Suggest two causes for this type of variation.
e. Sketch a graph for this variation.

Q 5. YOU ARE PROVIDED WITH THE FOLLOWING SPECIMENS.

- | | |
|--------------------------------------|----------|
| 1. Maize seed labeled specimen | K |
| 2. Sorghum / millet labeled specimen | L |
| 3. Bean seed labeled specimen | M |
| 4. Ground nut seed labeled specimen | N |

Uses it to answer questions that follow.

- a. A part from color, use one physical characteristic to put the seeds into two groups. Write down the physical characteristics that you have used to put seeds into two groups.
b. Using letter **K**, **L**, **M** and **N** to represent the seeds construct a dichotomous key that can be used to identify the seeds.
c. State one way in which ground nut contributes to the nitrogen cycle.

Q 6. YOU ARE PROVIDED WITH A BEAN SEED WHICH WAS SOACKED IN WATER

- a. Measure the longest axis and record its length in mm
b. Suppose the bean seed was drawn to a magnification of $\times 4$. Calculate the length of the drawing.

- c. Using hand peel the seed and separate the cotyledons so that the embryo is attached to one cotyledon. Draw the cotyledon with the embryo and label any two parts.
- d. Mention any one food substance stored in a bean seed.

Q 7. YOU ARE PROVIDED WITH SPECIMENS X (ELEPHANT GRASS) AND Y (SISAL)

- a. Draw specimen **Y** and label any two parts.
- b. Calculate the magnification of your drawing.
- c. Which one of the two specimens could with stand dry conditions.
- d. Explain your answer in c.
- e. Give any one product of specimen **X**.
- f. To which group of the plants do specimen **Y** belong

Q 8. YOU ARE PROVIDED WITH THE FOLLOWING

- 1 Bean seed marked **G**
- 1 soaked maize seed marked **H**
- A razor blade or scalpel
- Dilute iodine solution

Use it to answer questions that follow.

- a.
 - i. Measure the longest axis of specimen G and record its length in millimetres.
 - ii. Draw specimen G and label any two parts.
 - iii. Calculate the magnification of your drawing. Show your working.
- b. Place specimen H flat on the bench and cut it down the middle lengthwise into two separate parts. Apply one or two drops of dilute iodine solution to one of the cut surfaces.
 - i. Describe the result obtained.
 - ii. What conclusion can you make from these results.

Q 10. YOU ARE PROVIDED WITH THE FOLLOWING:

- Food solution marked A (Bean seed)
- Iodine solution
- Copper sulphate solution
- Sodium, hydroxide solution ➤ Water in a beaker (container) ➤ Two test tubes.

- a. Test the food specimen for starch. Complete the table by filling in procedure, results and conclusion.**

| FOOD TEST | PROCEDURE | RESULTS | CONCLUSION |
|-----------|-----------|---------|------------|
| STARCH | | | |

- b. Test the specimen for proteins. Complete the table by filling in procedure, results and conclusion.**

| FOOD TEST | PROCEDURE | RESULTS | CONCLUSION |
|-----------|-----------|---------|------------|
| PROTEIN | | | |

Q 11. YOU ARE PROVIDED WITH 14 BEAN SEEDS.

- a. Measure the length of each seed and record the result in millimeters in table below. Indicate the number of seed under each length.

| Length (mm) | 7 | 8 | 9 | 10 | 11 | 12 |
|-----------------|---|---|---|----|----|----|
| Number of beans | | | | | | |

- b. On the graph paper provided, plot a graph of number of beans against length.
c. What type of variation is shown by the plotted graph.
d. State two causes of this type of variations

Q 12. You are provided with the following:

- very dry groundnut seed labelled specimen **B**;

- very dry maize seed labelled specimen **C**;
- ruler which can measure in millimeters;
- a match box With 10 sticks; - a paper clip.

- a. Measure the longest axis of each specimen and record your results in millimeters in **Table 1**. (2 marks)

Table 1

| SPECIMEN | LENGTH (mm) |
|----------|-------------|
| B | |
| C | |

- b. Draw specimen **B** with a magnification of x5. (2 marks) c.

- (i) Pierce the paper clip into specimen B as shown in **Figure 2**.

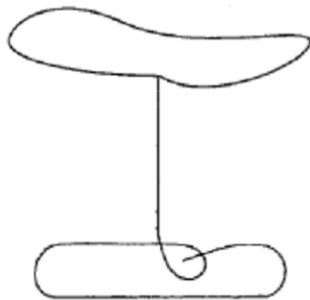


Figure 2

- (ii) Light a match stick and use it to burn the specimen. Observe what happens.
- (iii) Pierce the paper clip into the soft part of specimen **C** as shown in **Figure 2**.
- (iv) Light a match stick and use it to burn the specimen. Observe what happens.

(v) Record your observations for specimens **B** and **C** in **Table 2**. (2 marks) **Table 2**

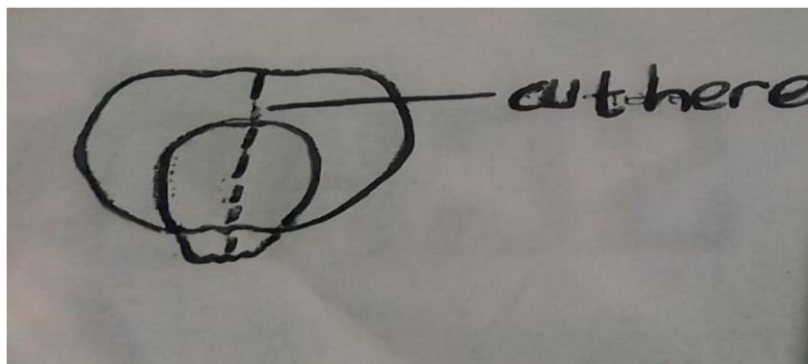
| SPECIMEN | OBSERVATION |
|----------|-------------|
| B | |
| C | |

Explain your observations in **Table 2**. (2 marks)

e. Describe how you can test specimen **C** for lipids. (2 marks)

Q13. YOU are provided with 2 maize seeds labelled A and B a razor blade or scalpel and a ruler. Carefully study the specimen and answer the question below. a. State two differences between A and B.

b. Using the razor blade or scalpel cut a longitudinal section along the narrow side of specimen as shown below



- c. Draw the longitudinal section and label three parts.
 - d. Calculate the magnification of your drawing. Show your working.
 - e. Explain why a germinating seed tastes sweeter than an ungerminated seed. **Q14 you are provided with an onion bulb and a razor blade or scalpel or knife.**
- a. Make a longitudinal section of the onion bulb, draw and label any three parts. (4 marks)
 - b. Describe how you would test the specimen for the presence of reducing sugars. (6 marks)

Q15. You are provided with a mango twig.

- (i) What type of leaf arrangement is displayed by the twig?
 - (ii) What is the advantage of this type of arrangement of the leaves on the twig?
- b. Detach one leaf from the twig. Draw the leaf and label any three parts.
 - c. Calculate the magnification of your drawing. Show your working.

State three adaptations of the leaf for photosynthesis that can be seen in the specimen

Q16. You are provided with the following materials:

- Specimen **X**. Irish potatoes
- Salt solutions of the following concentration: 0%, 25% and 50%.
- Razor blade/scalpel or knife .
- Ruler.

- (i) Using a scalpel or razor blade,

- peel the specimen
- cut three small pieces that are 2 cm long, 1 cm wide and 0.5 cm thick.

- (ii) Place one piece in 0% salt solution, the other piece in 25% salt solution, and the third piece in 50% salt solution. Leave to stand for 10 minutes.

(iii) Remove the pieces.

(1) Measure the length of each piece.

(2) Try to bend each piece to test its flexibility.

a. Record your results in the following table:

| Concentration of salt solution (%) | Length of Potato piece in cm | Flexibility |
|------------------------------------|------------------------------|-------------|
| 0 | | |
| 25 | | |
| 50 | | |
| | | |

(e) From the table, state the relationship between salt concentration and length of potato pieces.

(f) Explain the results observed in flexibility the potato pieces in 0% salt concentration and 50% salt solution

Q17. You are provided with a small fish.

(i) Draw the fish and label any **two** locomotory structures. (4 marks) (ii) Calculate the magnification of your drawing. (2 marks)

- (i) Describe the shape of the fish. (1 mark)
- (ii) What is the advantage of this shape to the fish? (1 mark)
-
- c. How does drying preserve the fish? (1 mark)
- d. State two nutrients that human beings get from fish. (2 marks)

Q18. You are provided with specimens X ((sisal) and Y(reeds).

- a. Draw specimen **Y** and label any three parts. (4 marks)
- b. Calculate the magnification of your drawing. (3 marks) c.
- (i) Which one of the two specimens could withstand dry conditions? (1 mark)
- (ii) Explain your answer to 1.c.(i). (2 marks)
- d. Give any one product of specimen **X**. (1 marks)
- e. To which group of plants does the plant of specimen **Y** belong? (1 mark)

q19 . You are provided with the following

Food sample X (Gaiwa/maize flour)

- Food sample Y (ground nuts flour/sinjiro)
- Iodine solution
- 10% NaOH solution
- 1% CuSO₄ solution
- White paper

- Two test tubes

a. (i) Perform starch test food samples X and Y, and record your findings in **table 1**.

Table 1

| Food sample | Results |
|-------------|---------|
| X | |
| Y | |

(2 marks)

(ii) Draw conclusion from this experiment. (2 marks)

b. (i) Perform protein and test on food samples X and Y, and record your results in **table**

| Food sample | Results |
|-------------|---------|
| X | |
| Y | |

c. Draw conclusion from this experiment. (2 marks)

d.what type of lipid test is used in this experiment?

f. which food sample contains food nutrients that will be

1.Suitable for growth of young baby

2.Suitable for supplement in child with marasmus

g.Explain difference in energy content between food samples x and y

h. Name the deficiency disease that may result due to lack of food sample X

I.Name the end product of digestion of food sample x

- j. Describe the role of the food sample Y in carbon cycle
- k. Give the scientific name of each of the following maize, groundnut and bean seed
- l. Briefly describe the chemical digestion of the maize, ground nuts bean seed.
- m. what type of nutrients that can be obtain from each of the following specimen mentioned in above

20. You are provided with the following

- a part of a stem marked x
- a razor blade or scalpel or knife

A hand lens

-30 cm ruler

- scaple or knife ,

a. using a razor blade or scalpel cut a cross section through the middle of the specimen X and observe with a hand lens

b. cut a cross section through the middle of section of specimen x and label any two parts 21. You are provided with specimen X CASAVA TUBER and Y SUGAR CAN STEM

- a. To which group of does specimen Y belong
- b. give a reason for your answer
- c. How can you test specimen X for starch
- d. Draw and label any any three parts specimen x find and y
- e. which specimen can withstand the dry condition and explain your answer
- g. Give any three products of specimen of X and Y

FOOD TESTS

TEST FOR REDUCING SUGARS (BENEDICT'S TEST)

○ Reducing sugars remove O₂ from Benedict's solution during reaction. Examples include glucose and maltose.

PROCEDURE

1. Prepare a food solution of the food sample.
2. Add 2cm³ of Benedict's solution to 1 cm³ of the food solution in a test tube.
3. Gently heat the mixture in a water bath at about 80°C for 5 minutes.
4. Observe colour change.

RESULTS

- The mixture changes from clear blue to brick-red colour if a reducing sugar is present.
- The mixture remains blue if reducing sugars are not present.

TEST FOR NON-REDUCING SUGARS (BENEDICT'S TEST)

- Non-reducing sugars include disaccharides such as sucrose and lactose.

PROCEDURE

1. Obtain a food solution containing a non-reducing sugar only such as sucrose in a test tube.
2. Add a few drops of dilute hydrochloric acid to the food solution.
3. Gently boil the mixture for 3-5 minutes to hydrolyse the disaccharide into monosaccharides. Effervescence (fizzing) will occur due to production of CO₂ during reaction.
4. Cool the mixture and then add a few drops of sodium hydroxide solution to neutralize the HCL.
5. Next add 2cm³ of Benedict's solution and shake well.
6. Heat the mixture in a water bath for 5 minutes.
7. Observe colour change.

RESULTS

- A brick-red colour change indicates presence of a non-reducing sugar.
- Blue colour indicates non-reducing sugars are not present.

TEST FOR STARCH (IODINE TEST)

PROCEDURE

1. Obtain a food solution in a test tube.
2. Add a few drops of iodine solution to the food solution.
3. Observe colour change.

RESULTS

- Blue-black (dark blue) colour change indicates starch is present.
- Orange-brown colour indicates starch is not present

TEST FOR PROTEINS (BIURET TEST)

METHOD 1

PROCEDURE

1. Obtain 2cm³ of food solution in a test tube.
2. Add 4-5 drops of Biuret solution to the food solution and shake well.
3. Observe colour change.

RESULTS

- Purple or violet colour change indicates proteins are present.
- If mixture remains blue means proteins are not present.

METHOD 2

PROCEDURE

1. Obtain 2cm³ of food solution in a test tube.
2. Add 1cm³ of sodium hydroxide to the food solution.
3. Next add 1% copper sulphate solution drop by drop.
4. Observe colour change.

RESULTS

- Purple or violet colour change indicates proteins are present.
- If mixture remains blue means proteins are not present.

TEST FOR LIPIDS

METHOD 1: SPOT TEST

PROCEDURE

1. Put a drop of food solution or rub a solid food onto filter paper.
2. Leave the paper to dry.
3. Observe paper.

RESULTS

If a translucent greasy mark remains on the paper it indicates presence of fat or oil.

METHOD 2: EMULSION TEST

1. Mix a food solution with ethanol in a test tube and shake well to dissolve any fat in the food.

2. Pour some water into another clean test tube.
3. Pour a little food mixture into the new test tube of water.

RESULTS

□ If the water turns cloudy or milky means fats are present. □

If the water remains clear means there is no fat

TAKE CARE WITH THESE TOPICS BEFORE GOING IN MANEB EXAM ROOM THIS YEAR

SECTION A

1. TROPISM

2. TRANSPORT IN PLANTS

3. ECOSYSTEM

4. PHOTOSYNTHESIS

The teacher of the moment SIR GODFREY MALATA from Chitipa to Sanje
the CO- FOUNDER OF ONLINE CLASSES IN MALAWI

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SECTION A

BIOLOGY ESSAYS 2022 TARGET

Describe an experiment that could be carried out to show that fresh green leaves contain three types of pigments.

In this as a method, one would collect green leaves from plants in a school garden. The leaves should then be grinded using a pestle and mortar.

The grinded leaves should then be squeezed to obtain an extract. Cut a 2 cm by 10 cm strip of filter paper. Put a drop of the extract on the strip about 4 cm from the bottom edge. Dip the bottom edge of the filter paper with a drop of extract in alcohol in a beaker about 2 cm from the spot of the extract.

After some few minutes, the alcohol rises up the strip of filter paper dissolving the leaf extract. As alcohol passes the spot of extract, the different pigments in the extract move up at different rates, smaller ones will move faster than the bigger ones. This will separate the pigments in the extract into three different colored spots.

The three different colored spots indicate that leaves have three different types of pigments.

Describe how cooked starch and proteins are chemically digested in the human gut.

In the mouth, salivary glands produce saliva which contains an enzyme called salivary amylase. Salivary amylase digests cooked starch to maltose.

When the food reaches the stomach, gastric glands produce gastric juice which contains an enzyme called pepsin. Pepsin digests proteins to polypeptides.

When the food reaches the duodenum, pancreatic amylase in pancreatic juice produced by pancreas will continue digestion of starch to maltose. Trypsin in pancreatic juice digests polypeptides to peptides.

Finally in the ileum, the ileum lining secretes intestinal juice which contains enzymes that complete digestion of starch and proteins. Maltase digests maltose to glucose and peptidase digests peptides to amino acids.

Explain the mechanism of breathing in fish

For inhalation, a fish opens its mouth while muscular contractions lower the floor of the buccal cavity and pharynx. This increases the volume of, and decreases the water pressure in, the buccal cavity and pharynx. Water flows into the mouth from the outside because the internal water pressure is lower than external water pressure.

Operculum muscles bulge. This increases the volume and decreases the pressure in the gill region. Water flows from the mouth cavity over the gills. As water passes the gill filament, oxygen diffuses out of the water into the blood and carbon dioxide diffuses out of the blood into the water.

For exhalation, a fish closes its mouth while the muscles raise the floor of buccal cavity and pharynx. This decreases the volume of, and increases the water pressure in the buccal cavity. The internal water pressure exceeds external water pressure and the flexible edge of the operculum is forced open. The remaining water is forced out over the gills and through the operculum.

Flight in bird involves downward beat and upward beat. Write an essay describing what happens during downward beat and upward beat.

During downward beat the pectoralis major muscles contract, pulling the wing down and the pectoralis minor muscle relaxes. The flight feathers overlap in a way as to trap much air so that there is more resistance below the wing to generate lift.

During upward beat, the pectoralis minor muscle contracts and pectoralis major muscles relax, thus raising the wing up. The flight feathers overlap in a way as to let air pass between them so that air resistance is reduced below

the wing. As a result there is no upthrust below the wing and the force of gravity pull down the bird so that it losses height.

Describe five ways in which a bird is adapted to overcoming gravity and effect of drag in flight

Birds have streamlined body which reduces the effect of drag.

Birds have large and power pectoral muscles that provide power to flap wings in flight. This helps to overcome gravity.

Thirdly birds contain air sacs attached to the lungs and these make them lighter hence overcoming gravity.

Fourthly, birds have bones lighter hence overcoming gravity.

Lastly the feathers of a bird provide an aerofoil which generates lift hence overcoming gravity.

Describe five ways in which a fish is adapted for swimming. Your answer should be in essay form.

Fish has streamlined body which reduces drag as it moves through the water.

Fish has mucus glands which secrete slimy substance which moisten the scales.

Fish has flexible vertebral column which allows the fish's body to curve.

Fish has swim bladder which controls buoyancy and depth at which the fish swims in water.

The scales of fish overlap facing backwards. This reduces drag as the fish moves through water.

Describe how urine is formed in the kidneys of the human body. Write your answer in essay form.

Urine is formed in two stages, namely: ultrafiltration and selective reabsorption.

Ultrafiltration is a mechanical process that takes place in the Bowman's capsule producing glomerular filtrate.

Ultrafiltration occurs due to a combination of high blood pressure in the glomerulus, and the structure of glomerulus and Bowman's capsule. The high blood pressure develops in the glomerulus because the afferent arteriole is wider than the efferent arteriole. The high blood pressure squeezes the blood against the walls of the capillaries of glomerulus. The walls of these capillaries are semi-permeable so that substances with small molecules such water, glucose and urea are forced out of capillaries and Bowman's capsule into the renal tubule while blood cells and blood proteins remain in the blood in the glomerulus since they have large molecules.

As glomerular filtrate passes along the renal tubule, some substances that are useful to the body are selectively reabsorbed into the blood capillary network surrounding the nephron. These substances are reabsorbed either reabsorbed by osmosis (for water) or diffusion or active transport leaving behind substances in the renal tubule called urine

The end

GOD IS WITH ME AND HELP ME IN EVERYTHING I DO. SAY THESE WORDS!!!!

THE TTEACHER OF THE MOMENT SIR GODFREY MALATA JOIN OUR OFFICAL LEARNING GROUP TODAY



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