CSSC
FORM FOUR.
BIOLOGY 2B.

1. a) i/

SPECIMEN	COMMON NAME.
R	Tilapia Fish
S	Grasshopper
T	Toad.

03 Marks
01 ✓

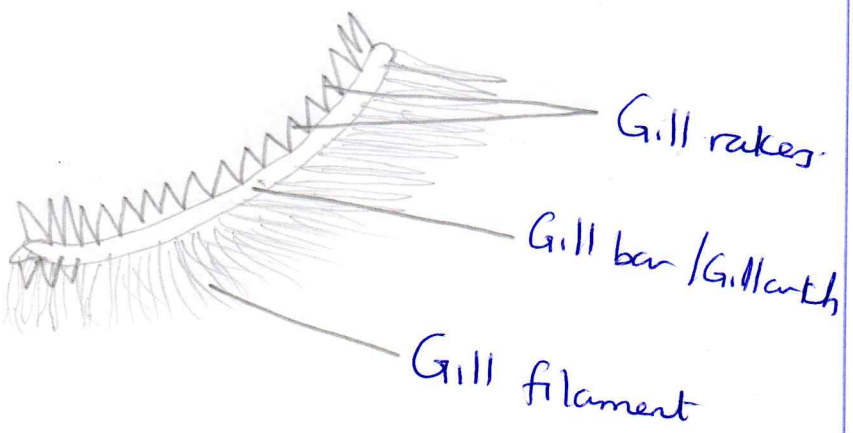
ii/

SPECIMEN	RESPIRATORY SURFACE.
R	Gills
S	Tracheal system (Tracheoles)
T	Skin, Lungs and buccal cavity

3 marks
01 ✓

b) i/ A DIAGRAM OF A GILL OF SPECIMEN (R).

C = 01
D = 03
L = 03
Total 07



1. b) ii)

PART	FUNCTION
• Gill rakers	- Filter out debris and food particles, preventing them from damaging the delicate gill filament.
• Gill bar/Gill arch	- Provides structural support and holds the gills in place.
• Gill filaments	- They contain numerous capillaries and are responsible for gas exchange.

3 Marks 1@

iii) Adaptation of Gills.

- They are thin inorder to reduce the diffusion distance ie. The gill membranes (epithelium) are very thin.
- Moist surface - Gills are always moist (wet) facilitating the dissolution of oxygen from water before diffusion
- Large surface area. Gills have numerous thin filaments covered with lamellae increasing the surface area for gas exchange.
- Rich blood supply. Gills contain a dense network of blood capillaries that transport oxygen to the body and remove CO_2
- Efficient Ventilation. The gills are well Ventilated so that gases can pass through them easily.
- Counter current exchange system. Water and blood flow in opposite directions maintaining a concentration gradient that maximizes oxygen uptake

06 Marks 1½@ any four point.

1. c) If the specimen (R) were to lose their gills, they would face several problems including

- Inability to breathe. Gills extract Oxygen from water allowing fish to survive, without gills tilapia would not be able to take in oxygen, leading suffocation.
- Lack of Oxygen supply to organs. Oxygen is necessary for cellular respiration, which provides energy. Including brain and muscles would fail due to a lack of Oxygen.
- Disruption/removal of waste materials. Without gills toxic waste would build up in blood stream leading to poisoning.
- Loss of Osmoregulation. Gills help regulate the balance of salts and water in the fish's body, Without gills, Tilapia would struggle to maintain proper internal conditions, leading to dehydration or excessive water intake, depending on their environment.

⚠ In short tilapia would not survive Long without gills as they are essential for breathing, waste removal and Maintaining internal balance.

3 marks 1@
Any three point.

2. a)

SPECIMEN	COMMON NAME
B_1	Bread Mould
B_2	Maize plant.
B_3	Spider.
B_4	Ascaris.

04 Marks
01@

b) i/

SPECIMEN	KINGDOM	PHYLUM/DIVISION
B_1	Fungi	Zygomycota.
B_2	Plantae	Angiospermophyta.
B_3	Animalia	Arthropoda.
B_4	Animalia	Nematoda.

04 Marks 00½@

ii) B_2 : Division Angiospermophyta.

Reasons

- Have well developed root system, stem and leaves.
- Have well developed conducting tissue which contain Xylem and Phloem.
- Usually the ovary develops into a fruit after fertilisation.
- Their seeds are enclosed and protected in the ovary.

02 Mark 1@
any two point

2. b) ii) B4 : PHYLUM NEMATODA

Reasons.

- They have a cylindrical, elongated and unsegmented bodies with tapering ends (pointed ends).
- They have special sensory structures known as Amphids and phasmids.

2 marks 1@

c) Advantages of specimen B4 : Ascaris

- Biological studies. Especially in the field of genetics.
- Biological pests control agents such as mosquitoes and locusts.
- Some are important in recycling of nutrients hence contributing to soil fertility.

03 marks 1@

Disadvantages of specimen B4 (Ascaris)

- Health issues - Causes Ascaris, leading to malnutrition, intestinal blockage, respiratory problems and organ damage.
- Nutrient depletion. Competes with the host for essential nutrients leading to stunted growth and weakened immunity especially in children.
- Intestinal obstruction. Large worm burdens can block the intestines requiring surgical intervention.
- Respiratory complications.
- Economic Impact.

3 mark 01@ any 3 point

2. d) IMPORTANCE OF SPECIMEN B_3 : Spider.

- Pest control spiders are natural predators of many insects including mosquitoes, flies and Agricultural pests, helping to reduce the population of these Unwanted Creatures.
- Source of food to other organisms such as birds and Lizard.
- Biological research. As a biological specimen.
- Silk production. Spider silk is strong and flexible, with potential uses in materials, science, medicine, and even creating stronger fabrics.
- Medical research. Spider venom contains compounds that could be used in developing new medications such as pain killer.

04 marks any four point

e)

SPECIMEN B_2	SPECIMEN B_1
• Belongs to kingdom plantae	- Belongs to kingdom fungi.
- Have ability to manufacture their own food	- Can not manufacture their own food.
- Reproduce by sexual reproduction	- Reproduce by asexual reproduction
- Bare flowers	- Do not produce flowers.

03 marks any three point