MARKING SCHEME BIOLOGY

SECTION A: (15 marks)

@ 01 mark = 10 marks

1

i	ii	iii	iv	v	vi	vii	viii	ix	x
B	D	B	A	B	C	B	D	B	D

2

LIST A	i	ii	iii	iv	v
LIST B	D	B	C	E	A

@ 01 mark = 05 marks

SECTION B: (70 marks)

3 (a) - Improvement of crop varieties through genetics and breeding thus high yield and diesease resistant crops

- Control of Pests and diseases using biological and chemical methods
- Soil management by understanding nutrients and using Fertilizers effectively
- Animal husbandry (improving livestock through breeding Feeding and disease control)

Food Preservatrom techniques such as refrigeratrom, drying, and use of Preservatives 04 marks

(b) i) Anatomy
ii) Parasitology or Entomology
iii) Ecology @ 02 mark = 06 marks

4 (a) Use stage clips to hold the slide firmly in place

(b) Start with the coarse adjustment knob, then use the Fine adjustment knob for clarity

(c) Adjust the diaphragm or reduce light intensity using the mirror / light source

10 marks

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5 (a) Cell membrane
(b) Nucleus
(c) Mitochondrion
(d) Cytoplasm
(e) Cell wall @ 02 marks = 10 marks

6 (a) - Kingdom
- Phylum
- Class
- Order @ 05 x 7 = 3·5 marks
- Family
- Genus
- Species

(b) i) Classification simplifies study: Grouping millions of species by shared characteristics makes them easier to study and identify

ii) Facilitates communication: Provides a standardized system for biologists world wide to share information.

iii) Enable Predictions: Scientists can infer traits of an organism based on its group example, Predicting an eagle's heart structure from a chicken's

iv) Reveals evolutionary relationships: Helps trace the evolutionary history and connections between organisms.

v) Removes confusions: Classification help to prevent confusion among biologists in the world as most organisms are given scientific means names which are known all over the world.

vi) Identifies characteristics of organisms: classificat on helps to know the characteristics of different living organisms. Any four points @ 01 mark = 04 marks

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6 (b) The Hierarchical level used by students

Kingdom
↓
Phylum / Division
↓
Class
↓
Order
↓
Family
↓
Genus
↓
Species

02½ marks

7 (a) A virus is a microscopic, non-cellular particle that can only reproduce inside a living host cell. It lacks cellular structures, It depends entirely on a host for reproduction. Virus consisting of genetic material (DNA or RNA) enclosed in a protein coat (capsid) 03 marks

(b) Components of a virus @ 01½ mark = 03 marks
i) Nucleic Acid (DNA or RNA) - carries genetic information
ii) Protein coat (capsid) - Protect the genetic material

(c) - Living characteristics - They can reproduce and shows all living thing characteristics only inside a host cell, they contain genetic material
- Non-Living characteristics - They are not made of cells, they donot carry out metabolism on their own and they can be crystallized like non-Living substance.
04 marks

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8 (a) Green algae producing bubbles

Process: Photosynthesis

Gas released is Oxygen (O_2) as one of the end product

Explanation:

- During photosynthesis, light energy is used to convert carbondioxide and water into glucose, releasing oxygen as a by-product. 03 marks

(b) Is incorrect that all autotrophs use sunlight because some autotrophs use chemical energy instead of sunlight which known as chemosynthesis. example is nitrifixing bacteria 03 marks

(c) i) Sodium (Na^+) 01 mark

Role: Maintains Fluid balance

Deficiency: dehydration, Low blood pressure 01 mark

ii) Potassium (K^+) 01 mark

Role: Important for muscle and never Function

Deficiency: Muscle weakness, irregular heartbeat. 01 mark

9. (a) Role of the Epiglottis.

- The epiglottis is a flap of cartilage that closes the trachea during swallowing. It ensures Food enters the esophagus not the airway. 05 marks

- If it fails: Food may enter the trachea that can cause choking or coughing cause the aspiration or lung infections.

(b) Active transport is needed because mineral ions in the soils are often at a lower concentration than in root cells, so they must move against the concentration gradient. This process requires energy (ATP) and carrier proteins in root hair cells. An example is glucose absorption in the small intestine, where it is actively transported into cells even at Low concentration. 05 marks

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SECTION C (15 marks)

10. 1. Large surface area (many alveoli).
Increases the area for diffusion of gases

2. Thin walls (one cell thick): Reduce diffusion distance

3. Moist surface: Allows gases to dissolve before diffusing.

4. Rich blood supply (capillaries): Maintains concentration gradient

5. Ventilation (breathing movements): continuosly brings in oxygen and removes carbondioxide.

6. Presence of Pericardial Fluid: Prevents friction as the heart beats.

Marks allocation

* Introduction 01 mark

⇒ Briefly explain the concept of human respiratory system.

* Main body (5 points @ 02½ marks = 12½ marks)

⇒ 5 structural adaptations in the human respiratory system

* Conclusion 1½ mark

⇒ Any relevant conclusion.

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