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LIST OF SPECIMENS

Group I

- Specimen A – Mature fresh eggs of catfish
- Specimen B – Fresh egg of domestic fowl (raw, with shell intact)
- Specimen C – Picture/model/chart of uterus containing a foetus
- Specimen D – Longitudinal section of ovary of Pride of Barbados flower
- Specimen E – Leaf of Pride of Barbados
- Specimen F – *Panicum* plant/Guinea grass (whole plant)
- Specimen G – Cocoyam plant/Caladium plant (whole plant)
- Specimen H – Corm of cocoyam
- Specimen J – Dry humus in a beaker
- Specimen K – Moist humus in a beaker
- Specimen L – Ripe orange fruit (whole)
- Specimen M – Longitudinal section of coconut fruit
- Specimen N – Longitudinal section of fresh chilli pepper fruit

QUESTION 1

Study specimens **A, B, C** and **D** and answer questions **1(a)** to **1(f)**.

- State **three** observable differences between specimens **A** and **B**. [3 marks]
- In the table below, use a tick (✓) to indicate the **appropriate** modes of reproduction of the organism that possesses **each** of specimens **A, B,** and **C**. [6 marks]

| Specimen | Type of fertilization | | Reproductive Process | |
|----------|-----------------------|----------|----------------------|------------|
| | Internal | External | Oviparous | Viviparous |
| A | | | | |
| B | | | | |
| C | | | | |

- (i) Name the Phylum/Division of the organisms that possess **each** of specimens **A** and **D**. [2 marks]
- (ii) Name the Class of organisms that possess **each** of specimens **A, B, C** and **D**.
- State the biological function of specimen **B** to the organism that possesses it. [1 mark]
- Crack open specimen **B** and carefully empty its content into a Petri dish. Complete the table below by naming **three** observable features of specimen **B** and state **one** function **each** of the features named.

| Three observable Features | One function |
|---------------------------|--------------|
| | |
| | |
| | |

[6

marks]

- State **one** habitat **each** of the organisms that possess specimens **A**, **B**, and **D**. [3 marks]

Many candidates could not answer question 1(c)(i) and 1(c)(ii) correctly but were able to state the types fertilization in specimens A, B and C. Many candidates were able to recognize the types of eggs but were unable to classify the organisms that possess them into their correct phylum and class.

Some candidates could not get complete marks due to poor spelling errors and they could not state observable features based on what they could see, but instead gave theoretical answers.

Many candidates were able to provide concise answers to question 1(e) by identifying them but could not give the functions of the parts of an egg. In question 1(f), the question on habitat was taken for granted as many candidates did not give specific answers as required.

The expected answers are as follows:

(a) Observable differences between specimens A and B

| <i>A/Egg of catfish</i> | <i>C/Egg of domestic fowl</i> |
|-------------------------|-------------------------------|
| • More/numerous/many | one/not numerous/few; |
| • Shell absent | shell present; |
| • Relatively small | relatively large; |
| • Green/yellow/orange | cream/white/peach/brown; |
| • Clustered | single; |
| • Round | oblong/oval; |
| • Soft | hard. |

(b) Table

| <i>Specimen</i> | <i>Type of fertilization</i> | | <i>Reproductive process</i> | |
|-----------------|------------------------------|-----------------|-----------------------------|-------------------|
| | <i>Internal</i> | <i>External</i> | <i>Oviparous</i> | <i>Viviparous</i> |
| A | | √ | √ | |
| B | √ | | √ | |
| C | √ | | | √ |

(c) (i) Phylum of specimens A and D

A: Chordata;

D:

Angiospermophyta/Angiospermatophyta/Magnoliophyta.

(ii) Class of specimens A to D

A: Osteichthyes/Pisces;

B: Aves;

C: Mammalia;

D:

Dicotyledoneae/ Dicotyledonae

/Magnoliopsida.

(d) Biological function of specimen BReproduction/production
offspring

of

(e) Table

| Three observable features | One function |
|-----------------------------------|---|
| Shell | Protection; Prevents dehydration/desiccation/drying up; Medium for diffusion of gases/gaseous exchange. |
| Shell membrane/vitelline membrane | Protection; Prevents dehydration/desiccation/drying up; Medium for diffusion of gases/gaseous exchange/selectively permeable. |
| Albumen/Egg white | Source of food for embryo; Provides water for embryo. |
| Yolk | Source of nutrients/food; |
| Chalaza | Holds the embryo at the centre of the egg/in place. |

(f) Habitat of specimens A, B and D**A:** Pond/river/mud/estuarine/lake/any correctly named habitat;**B:** House/garden/poultry/pen/farm/house;**D:** Forest/garden/farmland/farm.

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QUESTION 2

Study specimens **F**, **G**, and **H** and answer questions **2(a)** to **2(f)**

- Name the Class to which **each** of specimens **F** and **G** belong. [2 marks]
- State **one** reason **each** for the answers in **2(a)**. [2 marks]
- Name the root system of **each** of specimens **F** and **G**. [2 marks]
- (i) Detach **one** complete leaf from specimen **F** and make a drawing, 8 cm to 10 cm long of the leaf and label fully. [8 marks]
- (ii) State **one** function **each** of **three** of the labelled parts of the drawing in **2(d)(i)**. [3 marks]
- State **three** ways by which specimen **F** is of economic importance. [3 marks]
- (i) Describe **briefly four** observable features of specimen **H**. [4 marks]
- (ii) State **one** biological significance of specimen **H** to the plant from which it was obtained. [1 marks]

Many candidates interpreted questions **2(a)** to **2(d)** wrongly by giving wrong responses. They could not give the correct class of specimens **F** and **G**. Many candidates also gave wrong diagrams which led to complete loss of marks. Although many candidates knew the type of root system as required in question **2(c)**, many still lost vital marks to poor spellings.

Some candidates could not give the structure and function of the labelled parts of the detached leaf as required in question **2(d)**. However, poor technical details in the diagrams like wrong titles, incorrect magnification, rough diagrams and labeling led to loss of marks for some candidates.

Many candidates also could not correctly answer functions of labelled parts of specimen **F**/*Panicum* sp.

The expected answers include:

(a) Class of specimens F/*Panicum* sp./Guinea grass and G/*Cocoyam/Caladium* sp.

F: Monocotyledoneae/ Monocotyledonae /Liliopsida.

G: Monocotyledoneae/ Monocotyledonae /Liliopsida.

(b) Reason for Class of specimens F and G

F

- Leaves have parallel venation;
- Leaf sheath present;
- Presence of fibrous root system;

- Narrow leaves/leaves with narrow lamina
- Circular node present.

G

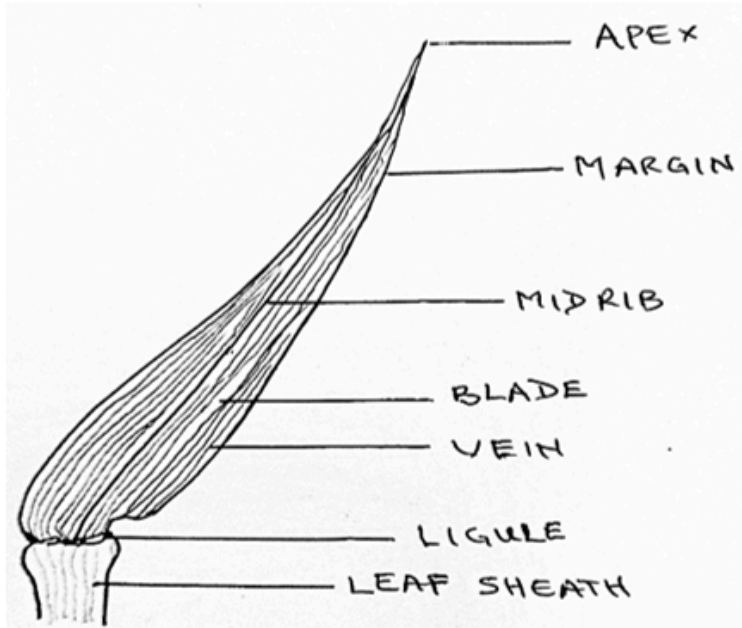
- Presence of fibrous root system/adventitious root;
- Circular node present.

(c) Root systems of specimens F and G

F: Fibrous.

G: Adventitious/contractile/fibrous.

(d) (i) Drawing/Diagram of complete leaf of specimen F/Guinea grass/*Panicum* sp.



Title (TL) Drawing/Diagram of specimen F/Guinea grass/*Panicum* sp.

Quality (Q)

Clarity of lines (CL)

Size (SZ) (8 cm to 10 cm)

}

Neatness of labels (NL) All guidelines ruled -½ mark;

All labels horizontal -½ mark

Magnification (MG) (x

$\frac{1}{10}$

/x0.1)-0.2

Details (D)

Parallel venation shown (PV)

Leaf sheath shown (LS)

Labels (L)

ligule, leaf sheath, lamina/leaf blade, vein, apex, midrib

(ii) Function of three labelled parts of leaf of specimen F/Guinea grass/*Panicum* sp.

Lamina/leaf blade: Photosynthesizes to make food for the plant/site for gaseous exchange.

Leaf sheath: Supports the lamina/attach the lamina to the stem.

Vein: Contains xylem which conducts water and mineral salts through the leaf/contains phloem to transport manufactured food out of the leaf/gives structural support to leaf/contains supporting tissues.

Leaf ligule: Allows movement of the lamina.

Apex: Allows water drop off the leaf/prevents water retention.

Midrib: Supports the blade.

(e) Economic importance of specimen F/Guinea grass/*Panicum* sp.

- Used as feed/fodder for cattle;
- Used as fuel;
- For roofing houses/structures;
- For making basket;
- Has medicinal purposes
- Used as rope;
- Used for mulching;
- For generating income.

(f) (i) Observable features of specimen H/corm of cocoyam

- (Vertical) swollen stem;
- Brown in colour;
- Bears concentric rings of nodes;
- Bears tiny brown scale leaves at some points of the nodes;
- Bears tiny axillary bud at some points of the nodes;
- Bears tiny, broad terminal buds;
- Surrounded with relatively large-scale leaves;
- Presence of long adventitious roots.

(ii) Biological significance of specimen H/corm of cocoyam to the plant from which it was obtained

Vegetative propagation/storage of food/for anchorage.

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QUESTION 3

Study specimens L, M, and N and answer questions 3(a) to 3(f):

- Classify **each** of specimens **L**, **M** and **N** based on:
 - type of fruit; [6 marks]
 - life cycle.
- Make a longitudinal section of specimen **L**, and state **four** observable difference: between specimens.
 - **L** and **M**; [4 marks]
 - **L** and **N**. [4 marks]
- State **three** observable similarities between specimens **L** and **N**. [3 marks]
- Make a drawing, 8 cm – 10 cm long of specimen **N** and label fully. [10 marks]
- Name the:
 - mode of dispersal of specimen **L**; [1 mark]
 - placentation of specimen **L**. [1 mark]
- State **one** economic importance of specimen **N**. [1 mark]

Many candidates gave good responses to this question. They were able to state the types of fruits in 3(a)(i) and the life cycle in 3a(ii) but did not write the differences between orange and chilli pepper correctly.

Many candidates did not give observable features as required. They gave varied theoretical responses such as colour instead of differences size, number of their seeds, placentation etc.

Some candidates were able to give the mode of dispersal of specimen L/orange fruit and one economic importance of Specimen N/chilli pepper.

Many candidates lost marks because their drawings lacked technical details like thin epicarp

shown with double lines (TE), elongated end with tapering apex (TA), use of wrong magnification and poor labelling.

The expected answers are as follows:

(a) (i) Type of fruit of Specimens L/orange fruit, M/coconut and N/chilli pepper

L: Berry/hesperidium;

M: Drupe;

N: Berry

(ii) Life cycle of specimens L, M and N**L:** perennial;**M:** perennial;**N:** biennial/perennial.(b) Observable structural differences between(i) specimens L and M

| <i>L/orange fruit</i> | <i>M/coconut fruit</i> |
|---------------------------------|------------------------|
| • Succulent fleshy fibres | hard fibres; |
| • More than one seed/many seeds | one seeded; |
| • Soft/succulent | stony/hard endocarp; |
| • Many chambers/locules | one chamber/locule; |
| • Soft to touch | hard to touch; |
| • Small | big; |
| • Mesocarp /soft/leathery | mesocarp fibrous; |
| • Axile placentation | basal placentation; |
| • Glands present | glands absent. |

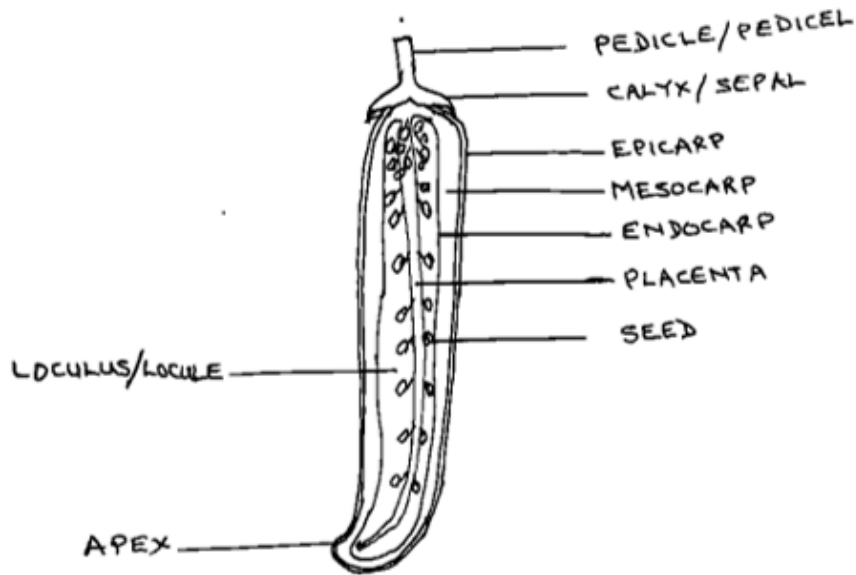
(ii) specimens L and N

| <i>L/orange fruit</i> | <i>N/chilli pepper fruit</i> |
|---------------------------|------------------------------|
| • Succulent fleshy fibres | succulent fibres absent; |
| • Bigger seeds | smaller seeds; |
| • Less seeds | more seeds; |
| • Spherical/round | elongated; |
| • Axile placentation | free central placentation; |
| • Scattered seeds | seeds clustered; |
| • Juicy/juice present | not juicy/dry; |
| • Glands present | glands absent; |
| • Calyx absent | calyx present. |

(c) Observable similarities between specimens L and N

Both possess

- seeds;
- two scars;
- pericarp/ (epicarp, mesocarp and endocarp);
- attractive colours;
- placenta.

(d) Drawing/Diagram of L.S of specimen N/chilli pepper

Title (TL) Drawing/Diagram of the longitudinal section of specimen N/chilli pepper

- Quality (Q)
 Clarity of lines (CL)
 Size (SZ) (8 cm to 10 cm)
 Neatness of labels (NL) All guidelines ruled;
 All labels horizontal
 Magnification (MG) (× $\frac{1}{2}$ / ×0.5 to ×1)

Details (D)

- Thin epicarp shown with double lines (TE)
- At least two seeds shown (TS)
- Elongated end with tapering apex (TA)

Labels (L)

Epicarp, pericarp, mesocarp, endocarp, seed(s), scar, placenta, loculus/locules, apex, calyx/sepal, pedicle/pedicel.

(e) (i) Mode of dispersal of specimen L/Orange fruit

Animal/Man.

(ii) Placentation of specimen L/Orange fruit

Axile.

(f) Economic importance of specimen N/chilli pepper

- Used for cooking/used as spice;
- Source of food;
- For medicinal purposes;
- Source of income.

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