

NAME:.....INDEX NO.....

SCHOOL:.....DATE:.....

BIOLOGY

FORM IV

PAPER II

TERM II, 2019

TIME: 2 ½ HOURS

MOKASA II PRE-MOCKS TERM II, 2019

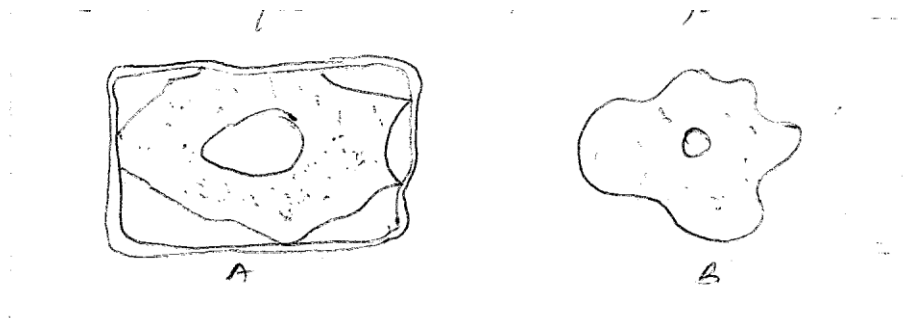
PAPER II

INSTRUCTIONS TO CANDIDATES

- ❖ *Write your name and index number in the spaces provided above.*
- ❖ *Answer ALL questions in the spaces provided.*
- ❖ *Answer all questions in **Section A**.*
- ❖ *Answer question **10** in Section B and either question **11 Or 12**.*

Instructions to candidates: Answer All Questions in the Spaces Provided

1. The diagram shows two types of cells placed in a certain solution. Study them and answer questions that follow



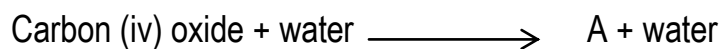
a. Name the physiological process responsible for the observed results. [1 Mark]

b. Give the correct biological term used to describe cells A & B. [2 Marks]

A –

B –

2. The equation below shows a chemical reaction that takes place in plants.



a. Identify substance A. [1 Mark]

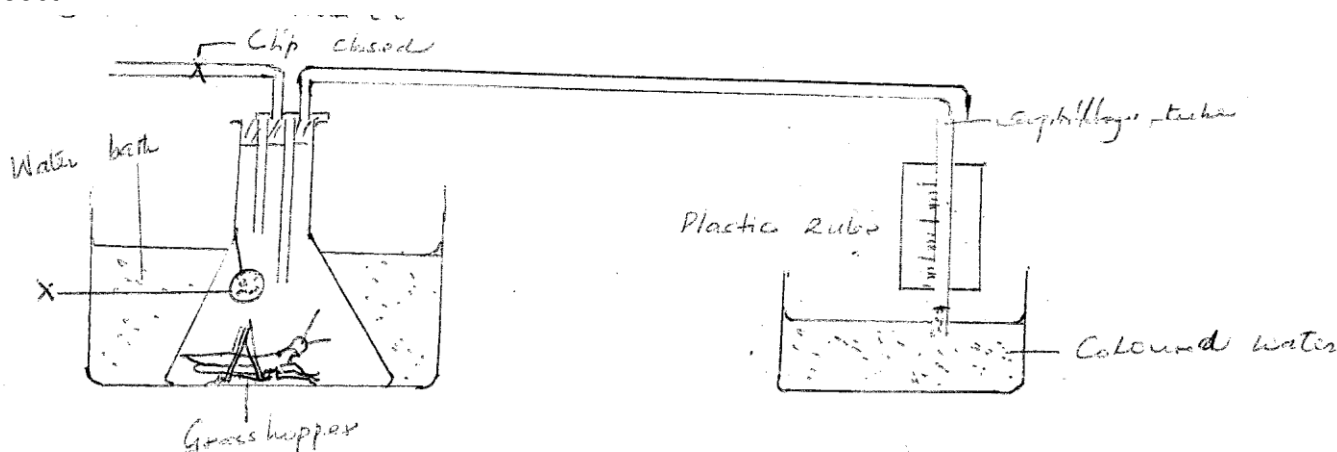
b. Name the process represented by the equation. [1 Mark]

c. Other than the reactants state two conditions necessary for this reaction. [2 Marks]

i.

ii.

3. The diagram below illustrates an experiment used to determine rate of respiration in a small insect.



a. Name the chemical compound labeled X and state its function. [2 Marks]

Compound –

Function –

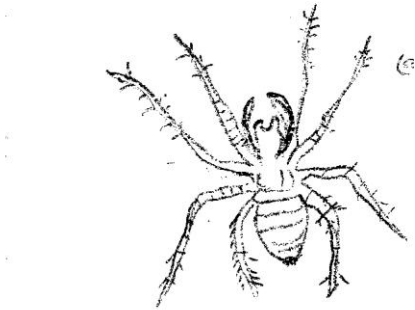
b. Why is the conical flask placed in a water bath? [1 Mark]

c. What would happen to the level of coloured water after 5 minutes? Explain: [2 Marks]

d. How can a control experiment be set?

[1 Mark]

4. In a biology lesson a student collected the animal in the diagram below.
Use it to answer questions that follow;



a. Name the phylum and class to which the organism belongs

i. Phylum _____

[1 Mark]

ii. Class _____

[1 Mark]

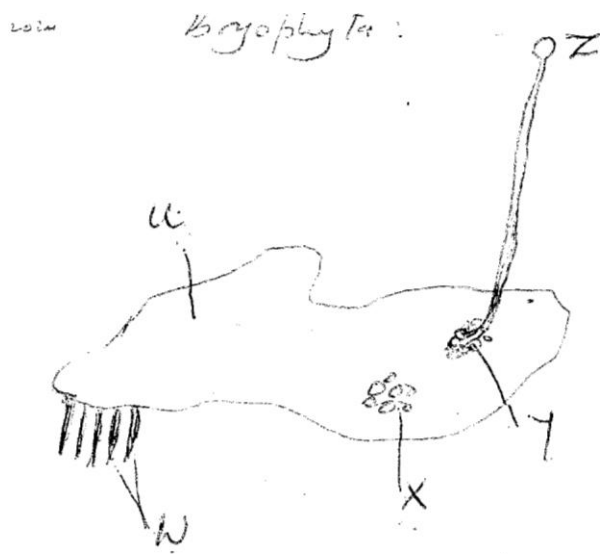
b. Give two reasons for your answer in 1 (i), (ii) above

[4 Marks]

i. _____

ii. _____

5. The diagram below represents a plant in the division Byrophyta:



a. Name the parts labeled

[5 Marks]

U

W

X

Y

Z

b. Name one function of part labeled.

[3 Marks]

X

Y

Z

6.

a. It is observed that when apical bud of a plant is removed, lateral buds sprout, whereas they do not sprout in presence of the apical bud;

i. What is the biological term used to describe this? [1 Mark]

ii. Give one application of this phenomena in agriculture. [1 Mark]

b. State four roles of IAA in plant growth and development: [4 Marks]

c. In epigeal germination the cotyledon is brought above the soil surfaces; Explain [2 Marks]

7.

a. State 2 structural modifications of nephrons in desert mammals. [2 Marks]

b. State a kidney disease whose symptom is coloured and turbid urine [1 Mark]

8. In a biological experiment; a cross was made between a tall pea plant & dwarfs plants; their progeny was selfed and the resulting plants were in a mixture in the ratio of 3:1. Make a biological cross to show these outcomes. [4 Marks]

9. Explain geographical distribution as evidence of organic evolution. [2 Marks]

SECTION B

Answer Questions 10 (Compulsory) and either question 11 or 12 in the Spaces Provided

10. The table below shows the changes observed in the dry weight in milligrams of a barley seedling, its embryo and Endosperm during the first ten days after the onset of germination.

Time (days)	Dry weight in milligrams		
	Embryo	Endosperm	Whole seedling
0	2	41	45
2	2	39	43
4	7	32	41
6	15	21	38
8	22	11	35
10	35	6	43

a. Using a suitable scale and on the same axis, plot a graph of dry weight of embryo, endosperm and whole seedling against time. [8 Marks]

- b. State and account for the changes in dry weight shown by:-
 - i. Endosperm [4 Marks]
 - ii. Embryo [4 Marks]
 - c. Explain the role of water during germination [4 Marks]
- 11.
- a. Describe how the mammalian heart is adapted to its function [10 Marks]
 - b. How does gaseous exchange take place in terrestrial plants? [10 Marks]
- 12.
- a. How is the Epidermis of a green plant adapted to its function? [6 Marks]
 - b. Describe how structural factors affect rate of transpiration in plants [8 Marks]
 - c. Describe how xerophytes adapted to minimize water loss in their habitat. [6 Marks]

MOKASA II PRE-MOCKS 2019 BIOLOGY PAPER II

MARKING SCHEME

FORM 4 TERM II, 2019

1. (a) Osmosis
(b) Flaccid; crenated

2. (a) glucose
(b) Photosynthesis
(c) Light, chlorophyll
3. (a) To absorb CO_2 produced
(b) Provides favorable temperature
(c) H_2O rises in the capillary tube; to occupy space after O_2 is used up
(d) Use a dead organism or do not include X.

4. (a) i) Arthropoda;
ii) Arachnida

(b) i) segmented body
Jointed appendages;
Exoskeleton
ii) 4 Pairs legs;
Head and thorax fused to form cephalothorax
5. (a) U – Thallus
W – Rhizoids
X – Antheridia
Y – Archegonia
Z – Capsule

(b) X – Produce male gamete

Y – Produce female gamete

Z – Produce spores

6. (a) i) Apical dominance
ii) Development of more branches required for increased harvest. E.g. tea & coffee.

(b) Stimulate cell division & cell elongation leading to primary growth

Tropic responses

Stimulate growth of adventitious roots; from the stem

Promotes parthenocarp;

Induce formation of callus tissues

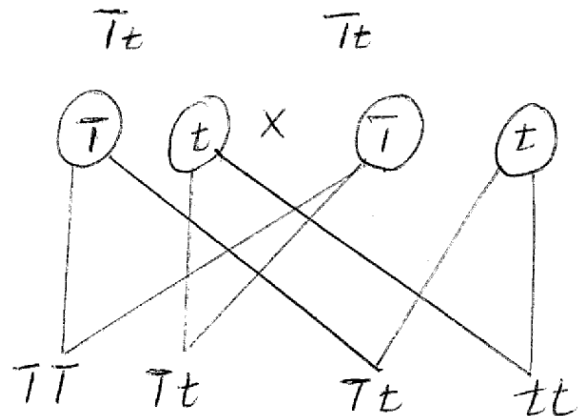
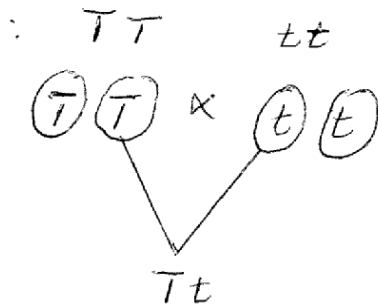
Induce cell division in Cambium leading to secondary growth.

7. (a) long loop of Henle

Few & small glomeruli

(b) Nephritis

8.



or:

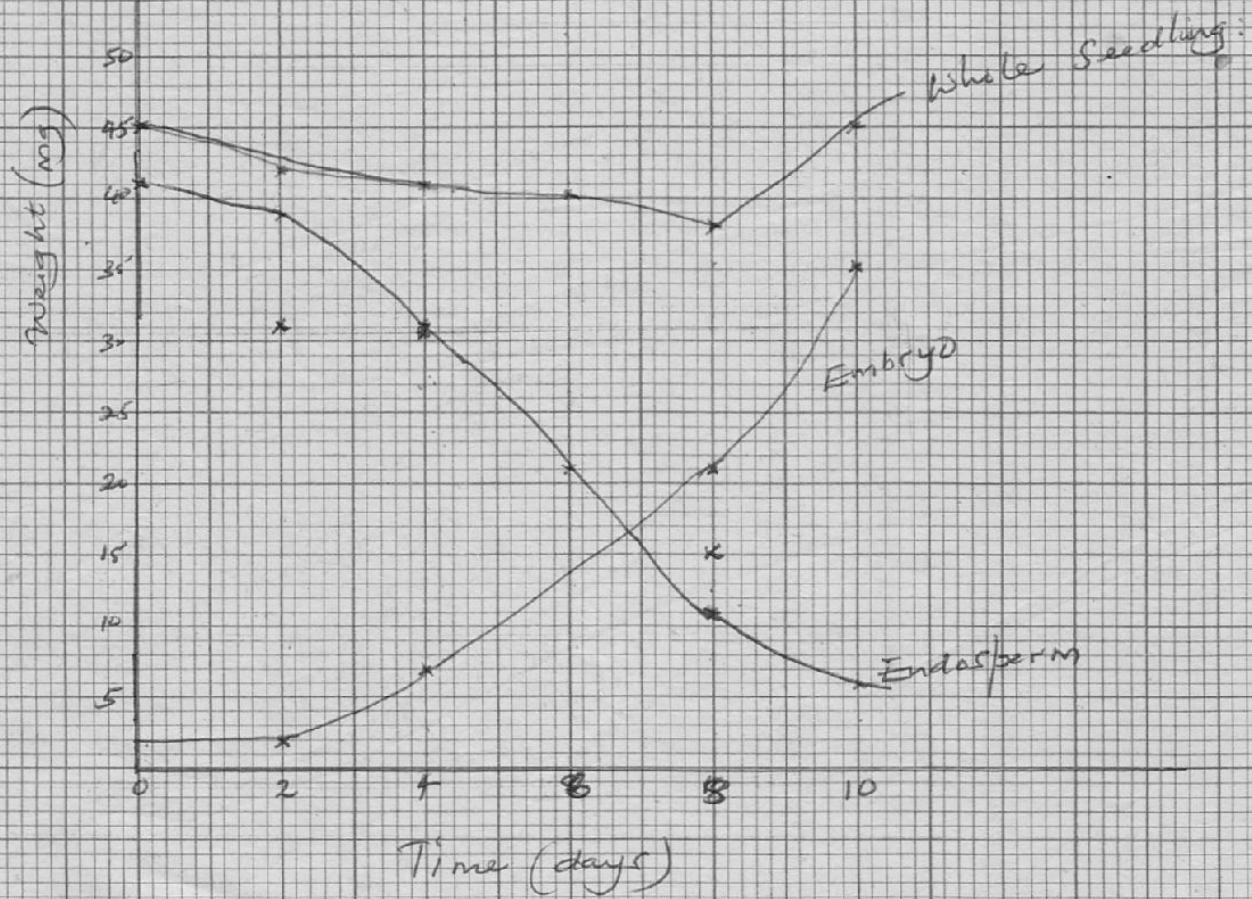
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T	Tt	Tt
T	Tt	Tt

$GT \rightarrow$	T	t
T	TT	Tt
t	Tt	tt

9. The earth was a single land mass; (Pangea), it broke into parts that drifted away (continental drift)

Organisms that were related became separated and evolved differently;

10. a)



- a. (i) Weight of embryo increases steadily; cell under division; new protoplasm is synthesized; hence increase in weight;
- (ii) Decrease in weight; stored food is hydrolysed; and transported to other regions; for respiration & synthesis of new materials.
- b. Hydrolysis of stored food
 - Activation of hormones & enzymes
 - Medium for enzyme catalyzed reactions
 - Medium for transport of hydrolyzed food

11. (a)

- Has myogenic muscles that contract & relax rhythmically without fatigue
- Cardiac muscle fibres are interconnected to ensure rapid spread of excitation through the wall of heart ventricle walls thicker than auricle walls & generate high pressure to pump blood over a long distance
- Has coronary artery that supplies the muscles with oxygen and nutrients and remove wastes from the heart muscles
- The pericardium surrounds the heart & prevent it from over dilation
- Has semi-lunar valves that prevent blood in the arteries from flowing back into the ventricles
- Inner layer of pericardium secretes pericardial fluid that lubricates the heart.
- Outer layer of heart covered with fat that acts as shock absorber
- Has Sino arteriole node that acts as pace maker
- A longitudinal septum separates the heart into two preventing mixing of oxygenated & deoxygenated blood

11b Gaseous Exchange

- Takes place in the spongy mesophyll during the day air diffuses in the large air spaces of the spongy mesophyll through stomata;
- The air dissolves in the thin layer of moisture over the spongy mesophyll cells; carbon dioxide from the air diffuses into the cells (photosynthetic cells) in solution form.
- Oxygen produced during photosynthesis diffuses out of the cells and out of leaves.
- At night air diffuses into the large air spaces & into the thin film of moisture over the spongy mesophyll cells
- Oxygen diffuses into the cells, Carbon(iv)oxide diffuses out of the cells into the air spaces & out of the leaf via stomata.

- Gaseous exchange also occur through the cuticle epidermis of young leaves; epidermis of root in the soil lenticels.
- In the lenticels cork cells are loosely packed; gaseous exchange occur between the loosely arranged cells & atmosphere.

12. Adaptation of Epidermis

a.

- Transparent to allow light to penetrate to the photosynthesis tissues
- A single layer of cells to reduce distance over which light penetrates
- Presence of stomata for gaseous exchange

b. Stomata

- The higher the number the higher the rate of transpiration and vice versa
- Location of stomata – rate is high when most are on upper leaf surface.
- Rate is lower when stomata are sunken other than exposed;
- Some plants reverse the stomata rhythm which reduces rate of transpiration;

Leaf size and shape

- When a leaf is broad surface area for evaporation increases which increases rate of transpiration when leaf is narrow rate of transpiration reduces;

Cuticle –

- when leaf has a thick waxy cuticle rate of transpiration reduces wax is water proof when cuticle is thin and not waxy rate of transpiration increases;

Hairy leaves

- Hairs on the leaf surface traps moisture air around the leaf is saturated with water vapour which reduces transpiration.

c. Adaptation of xerophytes

- Have leaves that are reduced in size which reduces surface for evaporation;
- Leaves have waxy cuticle that is thick to reduce evaporation since wax is water proof some leaves are folded to reduce number of stomata exposed to environmental factors.
- Stomata in them are usually sunken; water vapor accumulates in these depressions preventing further water loss'
- They have stomata whose number is greatly reduced to reduce rate of evaporation.