

**MARKING SCHEME**

**BILOGY FORM 4 PAPER 2**

1. (a) Osmosis

(b) Flaccid; crenated

1. (a) glucose

(b) Photosynthesis

(c) Light, chlorophyl

1. (a) To absorb Co2 produced

(b) Provides fovourable temperature

(c) H2O rises in the capillary tube; to occupy space after O2 is used up

(d) Use a dead organism or do not include X.

1. (a) i) Arthropoda;

ii) Arachnida

(b) i) segmented body

Jointed appendages;

Exoskeleton

ii) 4 Pairs legs;

Head and thorax fused to form cephalothorax

1. (a) U – Thallus

W – Rhizoids

X – Antheridia

Y – Archegonia

Z – Capsule

(b) X – Produce male gamete

Y – Produce female gamete

Z – Produce spores

1. (a) i) Apical dominance

ii) Development of more branches required for increased harvest. E.g. tea & coffee.

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

Tropic responses

Stimulate growth of adventitious roots; from the stem

Promotes palheno carpy;

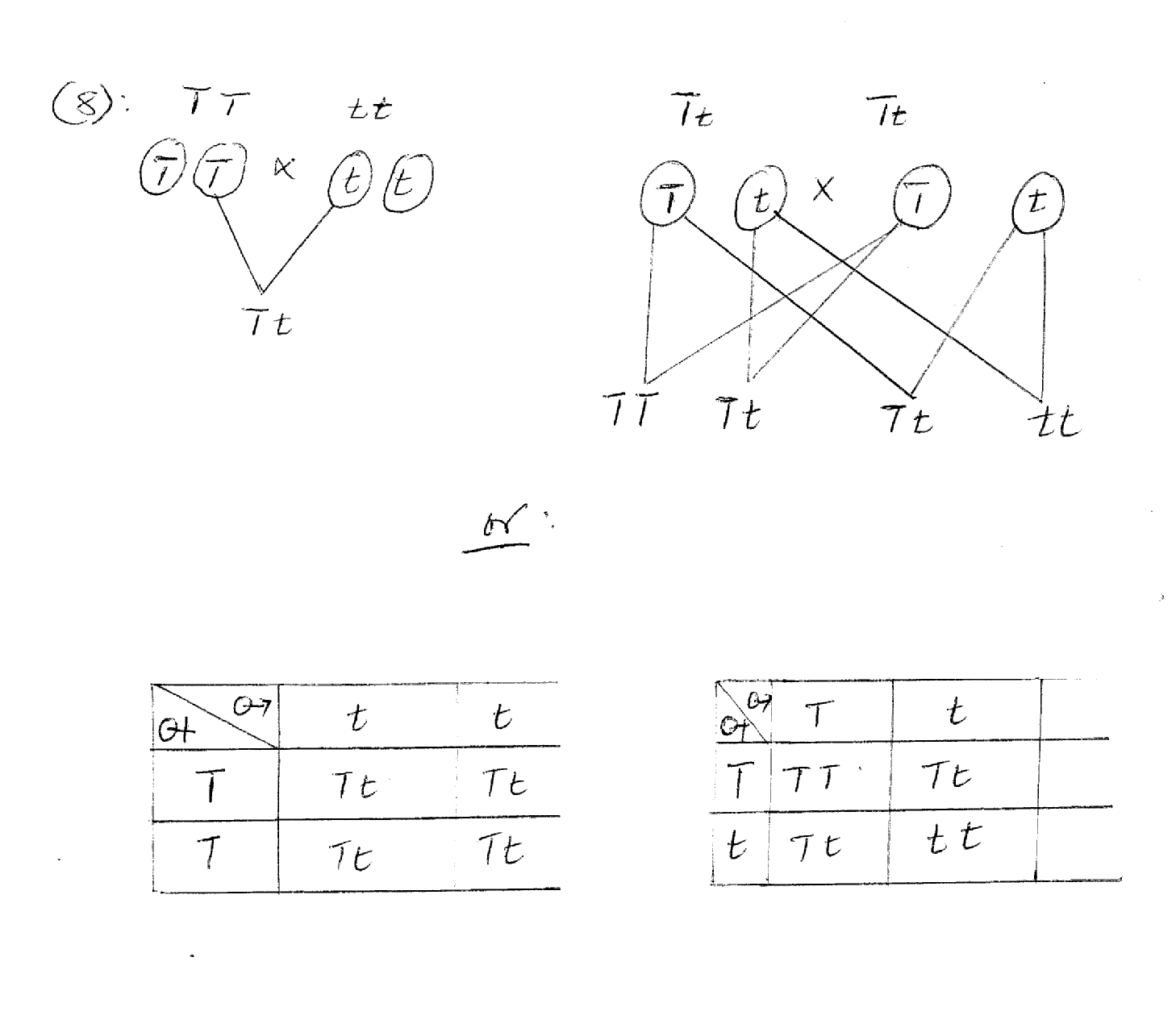
Induce formation of callus tissues

Induce cell division in Cambrian leading to secondary growth.

1. (a) long loop of henle

Few & small glomeruli

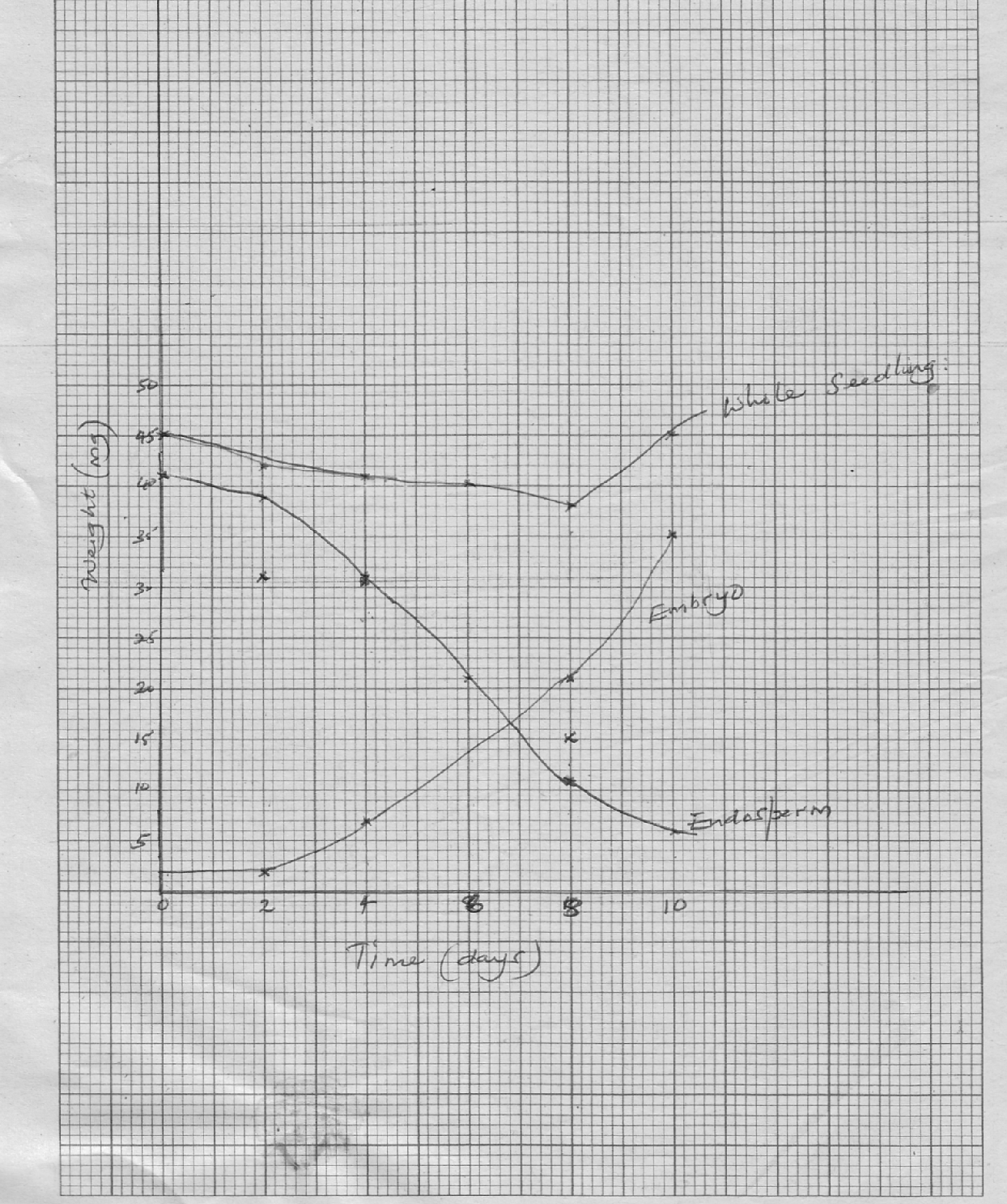
(b) Nephritis



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

Organisms that were related become separated and evolved differently;





* 1. (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.

* 1. Hydrolysis of stored food

Activation of hormones & enzymes

Medium for enzyme catalyzed reactions

Medium for transport of hydrolyzed food

1. (a) **Gaseous Exchange**

* Takes place in the spongy mesophyl 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.

(b)

* 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

1. **Adaptation of Epidermis**

* 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
  1. **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.
     + Late 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 blood 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 in water proof when cuticle is thin and not waxy rate of transpiration increases;

***Hairly leaves***

* Hairs on the leaf surface traps moisture air around the leaf is saturated with water vapour which reduces transpiration.
  1. **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.