BIOLOGY MARKING SCHEME PAPER 2

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Q1. a) i) A Epithelium of olveolus;

B Endothelium of capillary;

ii) X-Oxygen;

Y-Carbon (IV) oxide;

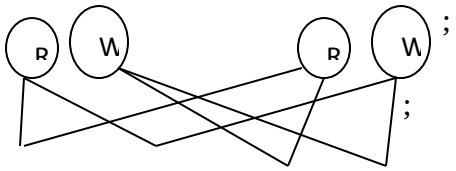
(iii) They are numerous thus creating a large surface area for gaseous exchange;

- They have a thin epithelium for faster diffusion of respiratory gases;
- They are well supplied with blood capillaries/ highly vascularized for transportation of respiratory gases;
- They are moist to dissolve respiratory gases; (mark any two)

b) Blood entering the lungs has come from body tissues and most of its oxygen has been taken up by tissue cells; carbon (IV) oxide formed through respiration in tissue cells has been added to the blood;

Q2. a)i) Pink flowered Pink flowered

Genotypes RW X RW;

Gametes 

;

;

RR RW RW WW;

ii) 1 Red : 2 Pink : 1 white ;

b) $\frac{2}{4}$ x 84;=$\frac{1}{2}$x84 =42plants;

c) Incomplete/ portal dominance;

Q3a) To investigate the gas produced during respiration; and photosynthesis respectively;

i) Carbon(IV)oxide;

b) ii) Oxygen gas;

c) It can photosynthesize and respire under water; by absorbing dissolved respiratory gases in water;

d) – increasing light intensity;

- increasing carbon(iv) oxide concentration;
- Maintain suitable temperature for enzyme action;

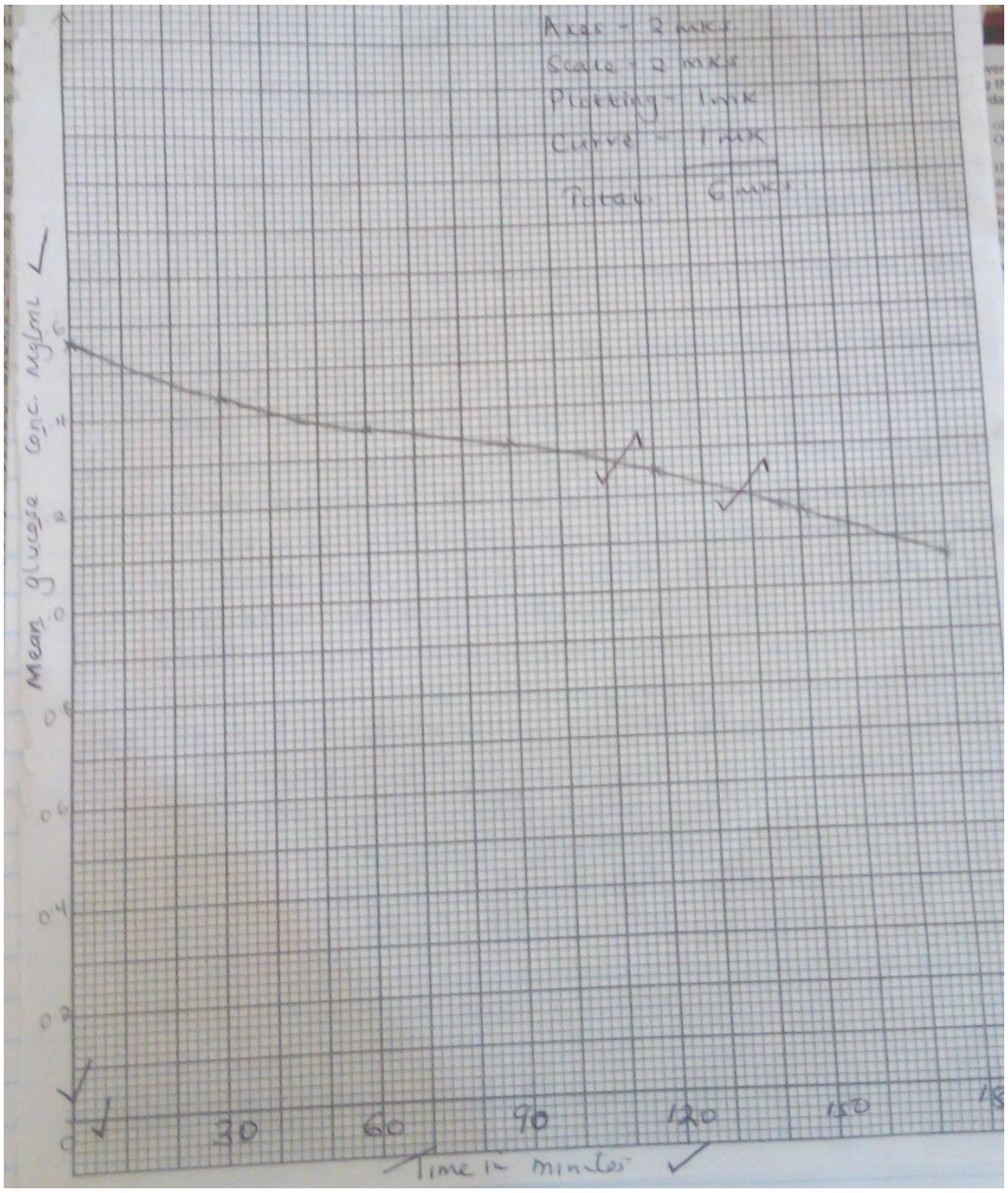
Q4a)

a) Darwinian	larmackian
1. Inheritance of genetically acquired characteristics	-inheritance of environmentally acquired characteristics
2. Characteristics	- Environment induces characteristics

appear spontaneously and are inherited	which are inherited.

b)i) Have common embryonic origin but modified to perform different functions;
(ii) Have different embryonic origin but are modified to perform similar functions;
c)-Petrification;
-Preservation of entire or parts of an organism;
-Impressions; e.g casts moulds.
d) A structure that ceased to function over long time hence reduced in size;
Q5i) Optimum temp; &Oxygen; are necessary for germination;
ii) -To mobilize/activate enzymes involved in germination or breaking dormancy;
-It is a reactant in hydrolysis of food;
- it acts as a solvent/ transport medium;
- It softens testa/seed coat causing it to rupture;

iii) A- There was germination;
B-No germination;
iv) A – There was germination since all the conditions necessary for germination were present;
C- No germination because oxygen, which is required for respiration was absent;
Q6a i) 60 minutes – 1.37;
180 minutes- 1.06;
ii) On grid provided;



iii) 1.35± 0.001mg/ml;

iv) To get more reliable results;

v) Glucose decreased due to oxidation to release energy; excess converted to glycogen; under Influence of insulin;

b) Amino acids; fatty acids; glycerol;

c) Trans located; to storage organs; and converted into starch;

Q7. a) leaves are modified to spines or thorns to reduce surface area over which transpiration occurs;

- Some shed their leaves during dry season; to reduce surface area exposed for transpiration.
- Some have thick waxy cuticle; to minimize rate of cuticular transpiration.

- Some can roll (fold) their leaves; to reduce the rate of transpiration by exposing fewer stomata to environmental factors; and reduce the leaf surface area exposed to transpiration.
- Have sunken stomata; which accumulates moisture in substomatal air spaces hence low diffusion gradient thus reducing transpiration rate;
- Some have reduced number of stomata; hence low transpiration rate; since the surface for water loss is reduced;
- Some have reversed stomata rhythm (Opening stomata at night and closing them by day); to prevent excessive water loss by transpiration;
- Possession of very deep roots; to absorb water from deep in the soil eg Acacia/
- Others have superficial roots which grow horizontally close to soil surface; to absorb water after a short light shower of rain.
- Possession of parenchyma cells in swollen stems and leaves for storage of water eg cactus with swollen stem;
- Many leaves posses resin coating; to increase reflection of solar radiation hence low transpiration rate;(Total 24 marks, max 10mks)

  b) Impermeable testa/seed coat prevents entry of water; and oxygen; for germination; prevents penetration of radical plumule.
- Immature embryo; hence seed cannot germinate due to incomplete development;
- Growth inhibitors; prevent growth by limiting enzymatic reaction;
- Very high temperatures; denature enzymes; very low temperatures make enzymes inactive; hence no growth.
- Absence of water; required to dissolve food.
- Absence of oxygen; necessary for respiration.

8. Consist of testes; that lie outside the abdominal/location outside the body to provide cooler environment/ lower temperatures; suitable for sperm production/ spermatogenesis; inside the testes there are seminiferous tubules; that are highly coiled and have actively dividing germinal epithelial cells; that form sperms;
- Interstitial cells that produce male sex hormones/ Androgens/testosterone; that promotes development of secondary sexual characteristics; and maintain masculinity;
- Epididymis form ducts that convey sperms out of the testes; testes they are highly coiled to increase surface area for the (temporary) storage of sperms;
- Sperm duct/vas deferens has thick muscular walls that contracts to propel sperms to the urethra (during ejaculation);
- Seminal vesicle; is a blind ending sac that produces alkali fluid; with nutrients for the spermatozoa/sperms; to provide energy for the sperms;
- Prostate glands; secrete alkaline; fluid that neutralizes the acidic vaginal fluids; and activates the sperms;
- Cowper's gland; secrets alkaline fluid that neutralizes the acidity of urine in the urethra; urethra is along tube along the penis; for conduction and expulsion of urine; and passage

of sperms during copulation; penis is made up of spongy erectile muscular tissue; consisting of numerous spaces that are filled with blood; making the penis to become erect during sexual stimulating/activity; to enable it penetrate the vagina; to deposit sperms; tip of penis has gland; that is highly innervated for stimulation during sexual activity;

- Scrotum/scrotal sac; is a sac like structure made of skin and it encloses testes protects the testes; (Total 37 max 20)