KENYA NATIONAL EXAMINATION COUNCIL
REVISION MOCK EXAMS 2016
TOP NATIONAL SCHOOLS

ALLIANCE BOYS HIGH SCHOOL

BIOLOGY THEORY

PAPER 2

MARKING SCHEME

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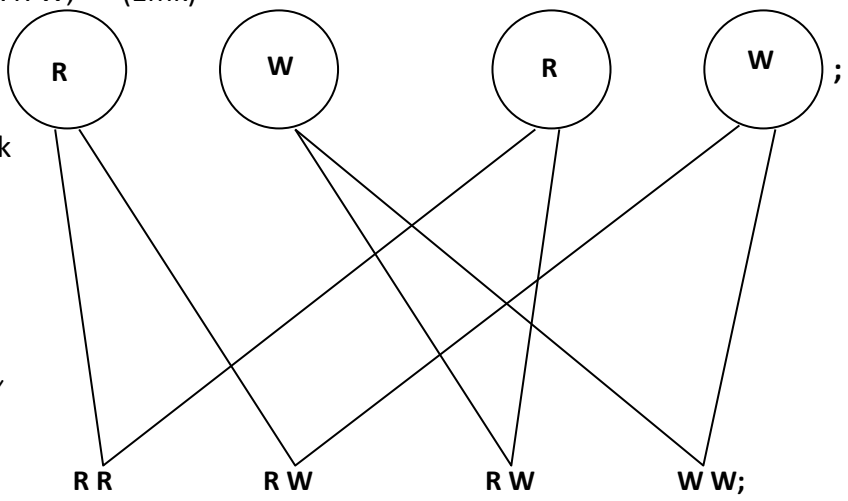
ALLIANCE BOYS HIGH SCHOOL KCSE TRIAL AND PRACTICE EXAM 2016
BIOLOGY
PAPER 2/ 231/2
MARKING SCHEME

1. a) P – sporangium;
   Q – spore;
   R – rhizoids;
   b) Formation of spores;
   c) i) Causes decomposition of dead matter thus releasing nutrients to the soil to increase its fertility;
   ii) Destroy old cloths/ shoes/ timber;
   iii) Causes food spoilage; (mark first two)
   d) i) Fungi;
   ii) - They lack chlorophyll;
   - Has cellwall made up of chitin instead of cellulose; (chitinous cellwall)
   - Store carbohydrates as glycogen; (mark first one)

2. a) K – phloem;
   L – xylem;
   M – root hair;
   b) Protects the apical meristem as the root is pushed into the soil;
   c) Osmosis;
   d) L is centrally located in the root while in the stem is arranged in a ring.
   Acc. Xylem is centrally placed in the root while in the stem it is arranged in a ring;
   e) Y – region of cell division;
   Z – region of cell elongation/ enlargement;

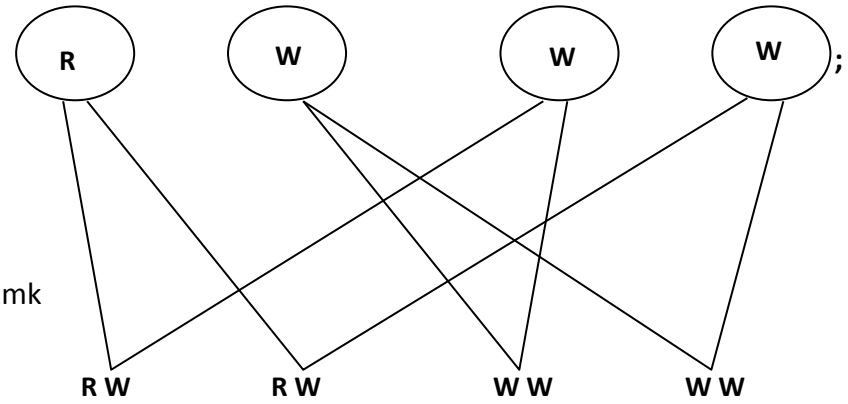
3. a) Parental R W x R W; ✓ (1mk)
   Genotype (F_1)



   F_2 genotypes

   Phenotypic ratio
   Red : Roan : White;
   1 : 2 : 1
   Rej. 1 : 2 : 1 only / Rej. Ratio only.
   b) Parental genotypes ✓ (1mk) R W x W W;

Gametes



Genotype ✓ 1mk

Genotypic Ratio R W : W W
1 : 1; ✓ 1mk Ref. Ratio only.

c) Gene for red colour coat and white colour coat are codominant/ have equal dominance acc. Incomplete dominance

4. a) i) Q;

ii) Ammonia requires a lot of water for dilution hence production of large volumes of dilute urine;

b) i) S;

ii) Excretes small volumes of (concentrated) urine;

c)

Nephron of Q	**Nephron of S**
- Shorter loop of hence	- Longer loop of henc;
- Larger glomeruli	- Smaller glomeruli;
	Rej. short/long nephron.

d) Increases osmotic pressure of blood;
leading to increased water reabsorptial (by osmosis) from glomerular filtrate; hence production of small volumes of concentrated urine;

Total 3, max 2 marks

5. a) H – Eustachian tube;
J – Semi-circular canals;

b) H – Tube open/ connection to the phalynx and to the middle ear/ opens during swallowing/ yawning and vomiting to equalize the air pressure in the middle ear with the atmospheric air pressure;

M – (pinna) curved/ funnel shaped to receive or collect and direct sound waves into the ear;

N – (cochlea) – long/highly coiled/ spiral in form to increase surface area for sound perception;

- Has sensory hairs/ cells which convert sound vibrations to impulses/ generate impulses;

- Has endolymph to transmit vibrations;

Mark one for each structure.

Rej. If the adaptation is not tied to function.

c) Total deafness;

d) Endolymph;

e) Balance; acc body balance/ posture.

6. a) Axes 2;;
Scale 1;
Plotting 2;;

Curve 2;;
Curve identity 1;

b) i) Population increases rapidly because of fewer predators/ less predation;
ii) Population decreases/ declines/ reduces due to shortage of food/ inadequate supply of food/ few number of prey;

c) *i*) 100 ± 1;

ii) 65 ± 1;

d) i) Population decreases/reduces; due to many predators;
ii) Population decreases / reduces; due to competition over the same food source; (interspecific competition)

e) Using a sweep net the houseflies were caught, marked using ink that cannot be erased easily counted and recorded; The flies were then released to the population. After 24 – 48 hours the procedure was repeated the flies in the second capture counted and recorded;

$$Population of\ flies = \frac{First\ marked\ x\ Second captures}{Marked recaptured};$$

7. **<u>Water dispersed seeds and fruits</u>;**
- Mesocarp/ seed has air spaces (fibrous mesocarp) thus light/ buoyant to float; therefore carried away by water;
- The fruit/ seeds are protected from soaking by water proof pericarp/testa;

<u>Animal Dispersed fruits/ seeds;</u>
- Presence of hooks for attachment to animals;
- Fruits are brightly coloured; succulent; aromatic/ scented; to attract animals; (which feed on them)
- The seed coats/ hard seed coats are resistant to digestive enzymes; (thus remain unaffected) [thus carried to other places = the seeds are dropped away from parent plant in faeces/ droppings]

<u>Self- dispersed fruits/ seeds/ explosive mechanism;</u>
- The dry pods/ fruits split (along lines of weakness/ sutures);
- Scattering seeds away from parent plant;

<u>Wind dispersed fruits/ seeds;</u>
- Cencer mechanism;
- Open/perforated capsule is usually loosely attached to stalk/ the long stalk is swayed by wind scattering seeds;
- Presence of hairs/ wing-like structure/ floss/ extensions which increase surface area/ for buoyancy; making it easy for fruits/ seeds to be blown away;
- Fruits/ seeds are light due to small size; therefore easily carried away by wind.

Total 20 marks
Max 20 marks

8. a) Nature selects those individuals/ organisms which are sufficient/ well adapted and allows them to survive; and rejects those that are poorly adapted by wiping them out;

b) - Individuals of the same species show variations; that are caused by genes;

- The variations can be passed from parent to offspring; through genetic inheritance;

some of the variations become more suited to the prevailing environmental conditions;

- Most organisms produce more offspring than the environment can support; hence there is always a struggle for existence; due to competition among individuals for scarce resources;

- Individuals posses traits/ characters that enable them to have competitive advantage to survive / stand better chances to survive in the struggle; in the end the well adapted/ suited individuals survive; and reach reproductive age; and pass over their favourable traits to their offspring; since survival is of the fittest;

- Poorly adapted individuals/ those without favourable traits perish/ die; and fail to reach sexual maturity/ reproductive age; hence do not pass their traits to their offspring (don't reproduce); the fittest individuals only survive; After many generations there is an accumulation of favourable genes/ traits; well suited to the environment.

Total 20
Max 20