KENYA NATIONAL EXAMINATION COUNCIL
REVISION MOCK EXAMS 2016
TOP NATIONAL SCHOOLS

STRATHMORE HIGH SCHOOL
BIOLOGY
PAPER 2
MARKING SCHEME

SCHOOLS NET KENYA
Osiligi House, Opposite KCB, Ground Floor
Off Magadi Road, Ongata Rongai | Tel: 0711 88 22 27
E-mail:infosnkenya@gmail.com | Website: www.schoolsnetkenya.com

STRATHMORE SCHOOL KCSE TRIAL AND PRACTICE EXAM 2016
PAPER 2
MARKING SCHEME

1. a) Strengthen the wind pipe;
   b) They ramify the body tissue for direct supply of individual cell with oxygen;
   - They have thin walls for easy penetration of gases;
   - They have moist cell wall that dissolves oxygen;

c) Insect	Mammals
- Transported in the tracheal system	-transported in blood vessels
- Transport fluid in coelom	- transport fluid in blood
- entry in thro' the spiracles	- entry is thro' the nose

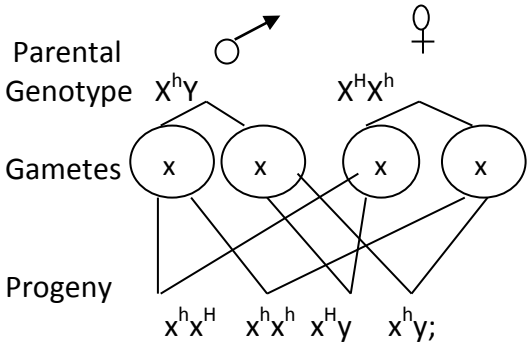
2 a)– Blood group AB individual can receive blood from individuals of all other blood groups
- Blood group AB individual can only donate blood to individuals of blood group AB
- Blood group O individuals can donate blood to all the other groups
- Blood group A individual can donate blood to group A and AB individuals
- Blood group B individuals can donate blood to blood group B and AB individuals

b) Because if blood of individual with different antigen mix agglutination; of the blood will occur in blood vessels leading to blockage of vessels and later death;

c) The donor must be healthy;
The donor must be between 18 – 65 yrs of age;

3. a) i) Man- X^hY;
Woman- X^HX^h;

ii)



b) 1/2 or 50 %;
1/2 or 50 %;

c) Because the **Y** chromosome lacks the genes that control the trait; such that any time the **X** that is donated by the mother has the recessive allele (h) there is no (H) on the **Y** from the father to mask the boy.

4. a) Biomass is a constant; dry weight of an organism;
b) - Energy is lost in respiration;
- Primary producers source energy directly from the sun;
- Loss through defaecation;

c) green plants absorb the energy from the sun during photosynthesis; then herbivores get it when they feed on green vegetation; its acquired by carnivore I as it preys on the herbivores and then to carnivore II as it preys on the carnivore I;

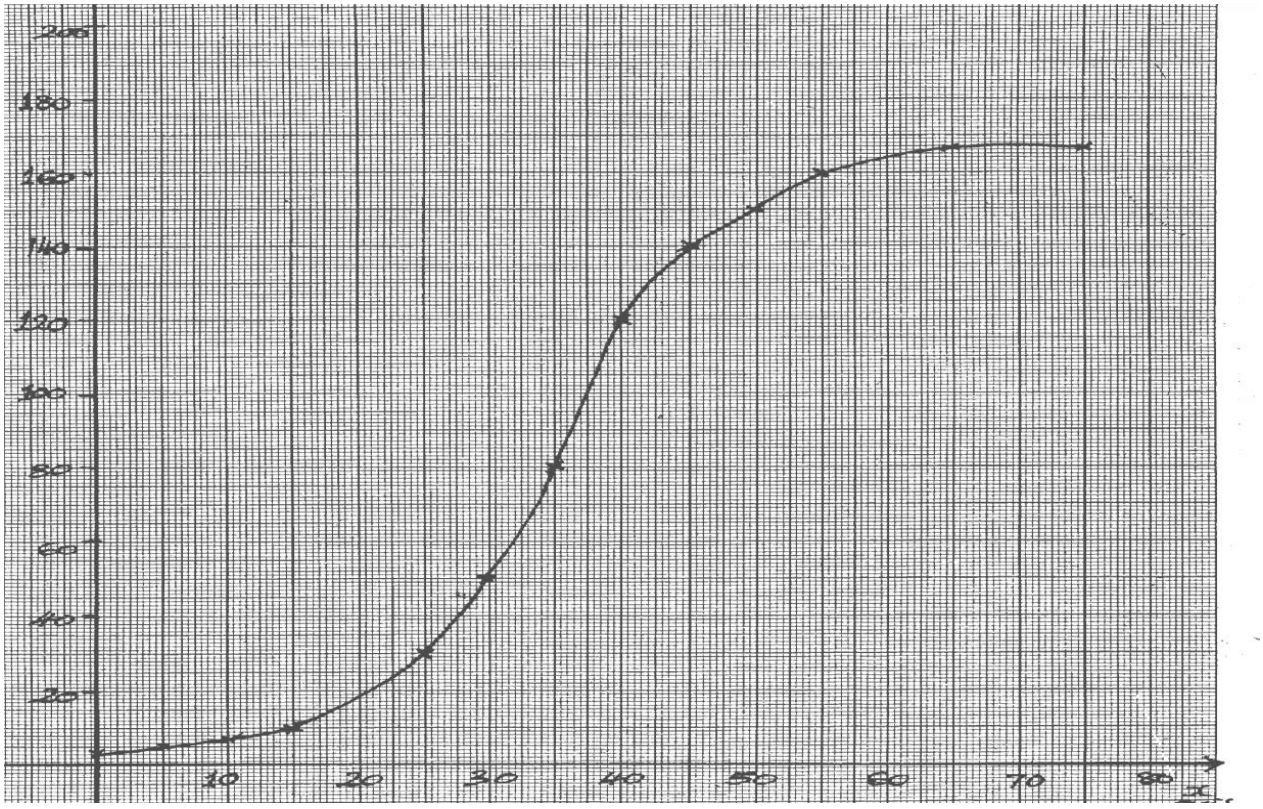
5. a) Midpoint between the diameter between the diameter of 3.0 µm and 2.0 µm
= 10+5 = 25 = 12.5%;
2 2

b) i) 1% salt solution in hypertonic solution to the cell sap; an osmotic gradient is created between the cell sap and salt solution; making water molecule to be drawn into the cell by osmosis; hence increases in diameter as the cell become turgid.

ii) 15% salt solution was hypertonic to the cellsap; an osmotic gradient was created between the cell sap and salt solution; making water molecules drawn out of the cells by osmosis; hence the cell become flaccid and decreased in the diameter.

c) Isotonic;

6 a) Ploting; scale vertical; horizontal; smooth curve; Axes; label



b) Sigmoid curve;

c) 98 yeast cells +- 1;

d) 47 minutes;

e) Rate of cell division = Change in minutes over
Change in time

= 128 – 60
42- 32

= 68 = 7 cells/ minutes
10

f) Rate of cell division is decreasing with the increase in time; due to shortage of oxygen and nutrients;
Space is limited, accumulation of metabolic wastes which inhibits multiplication;

g) i) population = First marked x second capture
Marked capture
100 x 60
20
= 300 grasshoppers;

ii) Population density = $\frac{\text{Total population}}{\text{Area}}$

$= \frac{300}{4}$

$= 75$ grasshoppers/ km^2

iii) Competion;

Death of those not suitable adapted;

7. – **Fossil evidence / paleontology**; fossils provide direct evidence of evolution; the relationships between extinct organism and existing ones; is shown by similarities between skeletons; hard parts and the skeleton structure of the species that are in the existence; e.g. Homo erectus, homo habilis have similar skeleton or insect preserved have similar structures to existing ones.

- **Geographical distribution;** apparently animals of common origin occupy similar geographical locations in different continents; e.g. camels in Africa and Llama in South America are found in the same latitude; or leopard, Tiger, and Jaguars are of common origin and occupy similar geographical locations in different continents i.e. in Africa, Asia and America respectively, this distribution is due to "continental drift";

- **Comparative embryology**; unrelated organisms in different classes of vertebrates have similar embryonic developmental patterns and structure; e.g. gill slits/ clefts are present in every early embryonic stages of mammals, Pisces, amphibian and aves; or vertebrates have a notochord at least at one developmental stage suggesting common ancestry.

- comparative cell physiology / Biochemistry/ serology; Analysis of blood proteins of unrelated animals reveal similar contents e.g. antigen – antibody reaction suggests common ancestry; if human serum is injected into a rabbit, secrete antibodies against human antigen;

- **comparative anatomy**; unrelated organisms have similar anatomical structures; pentadactyl limbs of mammals, bird, reptiles suggests common origin; these structures look different from others due to divergent evolution thus produces homologous structures; also the caecum in rabbits has developed due to use while appendix has become vestigial due to disuse;

TOTAL 20 MARKS

8 a) The sino autrial node initiates and maintains the heartbeat; by generating a wave of electrical signals that spreads through both atria; making them contract simultaneously; the signal then spreads to the autria-ventricular node (AVN); during which the atria empty into the ventricles; the signals spreads to the purkinje fibres; then conduct signals to the apex of the heart; and through the ventricular walls; these signals triggers a wave of powerful contraction of both ventricles; from the apex towards the atria driving blood in large arteries; the cardiac muscles are myogenic hence not controlled by nervous stimulation.

Any ten correct marking points x 1 = 10 marks

b) Thrombocytes are blood fragments that are irregularly shaped; they lacked a nuclear and they play a major role in blood clotting process.

When a damaged blood vessel is exposed to air; the inactive enzyme prothrombin is converted to active enzyme thrombin; under influence of thromboplastin factors like Ca^{2+}; thrombin the converts soluble plasma proteins fibrinogen; into insoluble protein fibres fibrin; fibrin forms a fine mesh over the wound trapping blood cells; and large proteins to form a soft fibrin clot; serum oozes out through the clot; and due to exposure to air it dries up and hardens to form a scab; which serves to protect soft underlying tissue and allow it to heal quickly.