KENYA NATIONAL EXAMINATION COUNCIL
REVISION MOCK EXAMS 2016
TOP NATIONAL SCHOOLS

PRECIOUS BLOOD HIGH SCHOOL
BIOLOGY THEORY
PAPER 2
MARKING SCHEME

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PRECIOUS BLOOD KCSE TRIAL AND PRACTICE EXAM 2016
BIOLOGY
PAPER 2 / 231/2
MARKING SCHEME

1. (a) M- Epithelium of alveolus; (1mk)
N – Endothelium of capillary/ Epithelium of capillary; (1mk)
(b) V – oxygen; (1mk)
W – carbon (iv) oxide; (1mk)
(c) Red blood cell/ erythrocyte; (1mk)
(d)
- Thin walled for diffusion of gases;
- Moist to dissolve respiratory gases;
- Vascularized to transport respiratory gases; (3mks)

2. (a) Physical – mastication/ chewing/ grinding;
Chemical – conversion/ hydrolysis of starch to maltose;
(b)
(i) Mouth cavity – saliva;
(ii) Stomach – gastric juice;
(iii) Duodenum – Bile juice/ pancreatic juice;
(c)
- Coiled to slow down movement of food to allow complete digestion/ absorption;
- Villi to increase the surface area for absorption;
- Dense network of capillaries/ highly vascularised to take away absorbed nutrients;
- Narrow to bring digested food into close contact with walls for easy absorption (Any 3 marks)

3. (a) (i)

$$P=\frac{FM\times SC}{MR} \quad / \quad \frac{First\,caught\,marked\,x\,Total\,2^{nd}\,catch}{\text{Re}captured\,in\,2^{nd}\,catch;}\left(\frac{Fisrt\,caught\,marked\,x\ Total\,2^{nd}\ catch}{\text{Re}captured\ in\ 2nd\,catch;}\right)$$

(3 marks)

(ii) Capture – recapture method;
Acc. Capture release recapture method
(1 mark)

(b) (i) Light; Temperature; wind; Humidity (2 marks)
(ii) Host ; Predation; Pollution / disease / parasite ; migration competition
(2mks)
Mark first two

4. (a) (i) Long sightedness/ Hypermetropia
(ii) Short eye ball; (1mark)
(iii) Use of a convex lens (1 mark)
(b)
- Circular muscles (of iris) contract;
- Radial muscles relax;
- Pupil becomes smaller;

(3 marks)

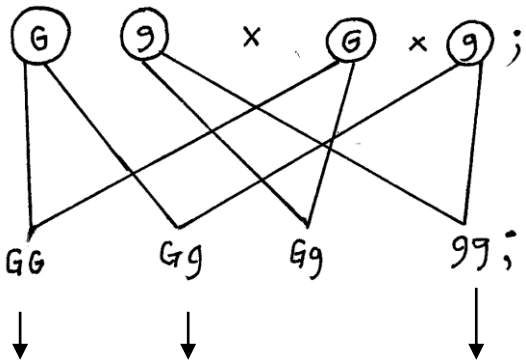
(c) Hearing (sound perception);
Body balance; (2 marks)

5. (i) During germination, it oxidizes/ utilizes stored food; but soon dies as it fails to trap light
for photosynthesis; since the leaves lack chlorophyll; (3 marks)

(ii)

Parental phenotype: variegated x variegated
Parental genotype: Gg x Gg;

Gametes



Offspring

Phenotypic ratio: 1 green : 2 variegated : 1 white

(5 marks)

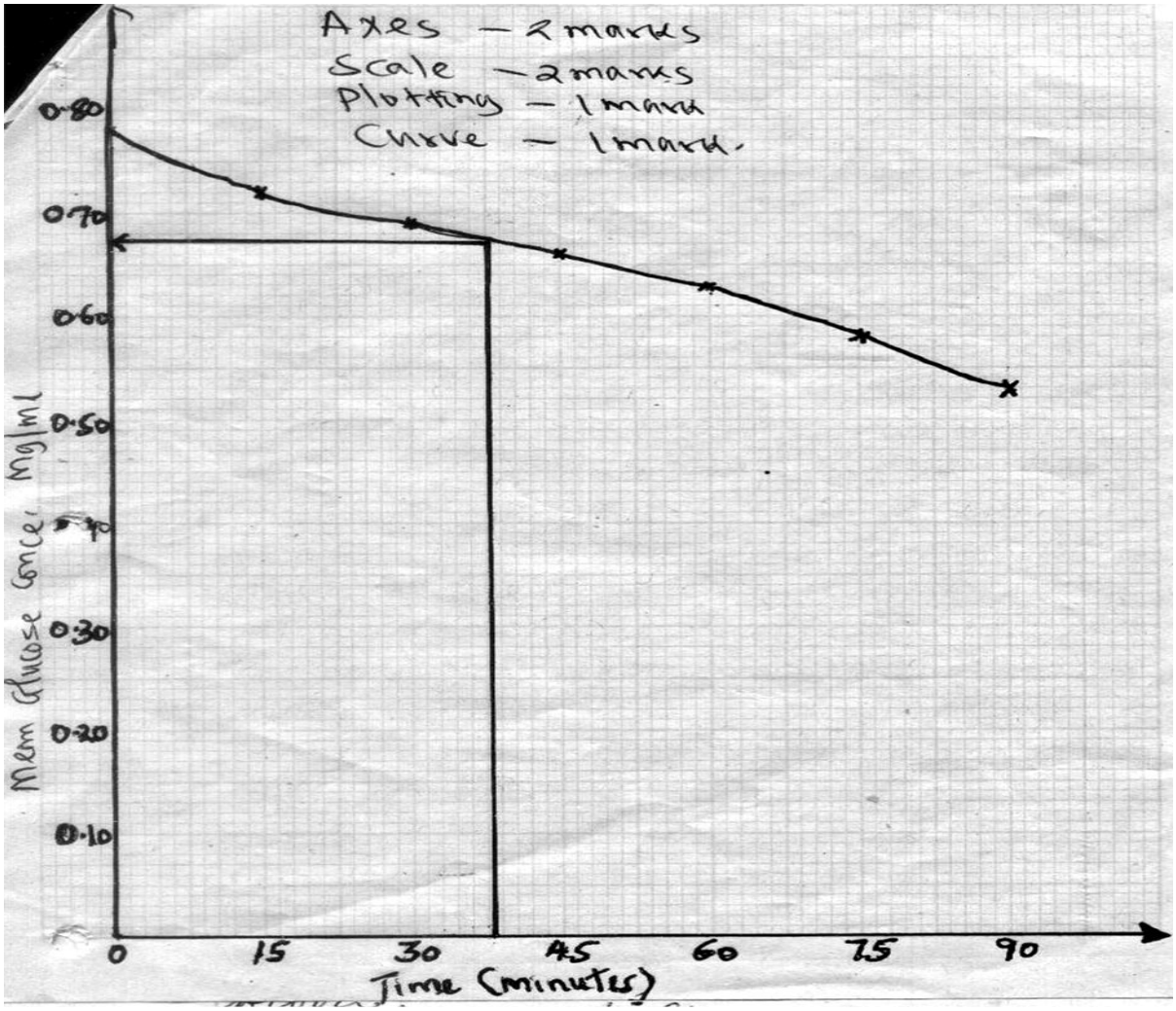
6. (a) (i) At 45 minutes 0.660 mg/ mp; (1 mark)
At 75 minutes 0.580 – 0.582 mg/ ml;
(ii) Check graph (6 marks)
(iii) At 37.5 minutes 0.670 ± 0.05 mg/ ml (1 mark)
(Evidence on graph to earn mark)
(iv) To obtain reliable results; (1 mark)

(v) The rats may have been different in terms of weight, sex, age; or had different rates of metabolism; (2 marks)

(vi) Glucose decreased; due to conversion into glycogen; utilization to release energy; (2 marks)

(b) It is highly soluble, therefore easily transported to the sites of respiration; it requires relatively low oxygen to oxidise a unit mass of glucose than the other substrates; (3 marks)

(c) Oxidized to give energy, carbon (IV) oxide and water; converted to glycogen and stored in the liver; converted to fats and stored under the skin, around the kidneys etc; (3 marks)



7. The heart is covered by the pericardium membrane which checks on its over – dilation; secreates a fluid tha
The heart is made up of cardiac muscle which is myogenic/ contract and relax without nervous stimulation; does not undergoe fatigue / contracts throughout life; have intercalated discs between its cells to enable the spread of wave of contractions throughout whole mass of muscle; sino – atrial node/ SAN in right atrium initiates heart contraction; atrio – ventricular node/ AVN receives wave of contraction from SAN; and spread them throughout the ventricles;
The coronary artery supplies heart muscles with blood rich in oxygen; and nutrients; coronary vein drains out blood rich in wastes/ carbon IV oxide;
A septum divides heart into two halves thus preventing mixing of oxygenated and deoxygenated blood;
Left ventricle is more muscular/ thicker; has small volume; to enable it generate the high pressure needed to pump blood to the rest of the body;
Atrio – ventricular/ cuspid valves between atria and ventricles prevent backward flow into the atria valve tendons prevent the valves turning inside out; Semi – lunar valves at base of aorta and pulmonary artery prevent backward flow of blood into ventricles;
Heart is innervated by vagus nerve; and sympathetic nerve; that speed up or reduce rate of heart beat/ contraction; Total 22. maximum 20

8. On landing on the stigma, the pollen grain sticks and germinates sending a pollen tube; into the tissue of the styles; The generative nucleus divides by mitosis into the two male nuclei; the tube nucleus occupies the tip of the growing pollen tubes with the two male nuclei behind it;
The pollen tube obtains nutrients from the style, tissue; as it grows towards the embryo sac/ ovule; It enters the ovule through the micropyle and penetrates the embryo sac; The tube of pollen sac bursts open and the tube nucleus disintegrates giving way for the male nuclei;

Double fertilization follows where one of the male nuclei fuses with the two polar nuclei forming a triploid; primary endosperm nucleus/ zygote; The other male nucleus fuses with the egg cell nucleus to form a diploid zygote; which develops into an embryo plant;
The zygote divides mitotically and becomes differentiated into a radicle and a plumule; with either one or two seed leaves (cotyledons); As the embryo develops, it derives nourishment from the embryo sac; through the suspensor cells;
The triploid primary endosperm nucleus divides mitotically; into a mass of nuclei that forms the endosperm; which acts as a food storage structure;
The embryo sac expands such that the growing embryo and endosperm are accommodated inside the integument; As the ovule develops into a seed, the integument becomes the seed coat;
The water contents of the tissues are drastically reduced to 1.5% resulting in a dormant resistant structure called a seed.