KENYA NATIONAL EXAMINATION COUNCIL
REVISION MOCK EXAMS 2016
TOP NATIONAL SCHOOLS

MOI GIRLS – ELDORET HIGH SCHOOL
BIOLOGY THEORY
PAPER 2
MARKING SCHEME

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MOI GIRLS – ELDORET TRIAL AND PRACTICE EXAM 2016
BIOLOGY
PAPER 2 / 231/2
MARKING SCHEME

1. (a) Osmosis; (1x1=1mk)

(b) Water molecules are drawn from the paw paw cells by the sugar crystal ✓1through osmosis; sugar dissolves ✓1 forming a solution; paw paw cell become more concentrated and drawn water molecules from the Petri – dish ✓1 by osmosis leading to a rise in the level of the solution (1x3=3mks)

(c) Sugar crystals will not dissolve no solution would form; ✓1
Reasons; Boiling kills cells/ destroy cell membrane hence no osmosis will occur ✓1

(1x2=2mks)

(d)
- Absorption of water by plant roots
- Closing and opening of stomata
- Feeding in insectivorous plants
- Mechanical support in plants (1x2= 2mks)

2. (a) decrease in oxygen concentration;✓1 and an increase in carbon(IV)oxide concentration; ✓1 (1x2=2mks)

(b) Germinating seeds respire/ use oxygen and release carbon IV oxide;
(1x1=1mk)

(c) Absence of light; undeveloped embryo/ immature embryo; presence of inhibitors, impermeable seed coat to water; lack of growth stimulators/ enzymes/ hormones (Any two) (1x2=2mks)

(d) Oxidation of stored food; to release energy for germination;✓ (2x1 = 2mks)

(e) Ecdyson; ✓ (1x1 =1mk)

3. (a) A - aesophagus/ gullet C - pancrease
G - appendix H - liver (½mk each) max 2

(b) Water/ mineral salts; (1x1=1mk)

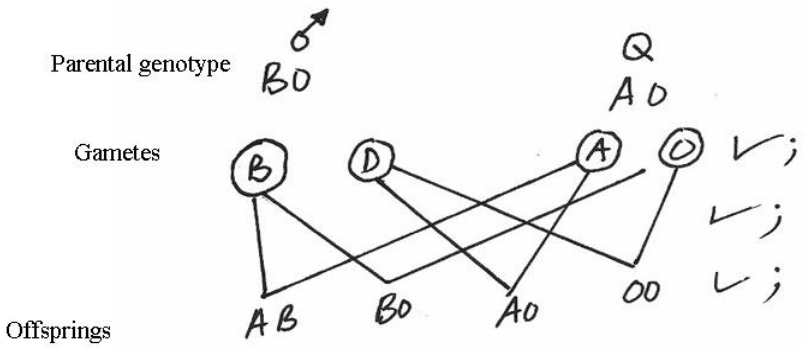
(c) Emulsification of lipids/ neutralize stomach acids; (1x1=1mk)

(d)
- Long to provide large surface area for absorption
- Presence of villi to increase surface area for absorption
- Highly vascularised/ well supplied with blood capillaries to transport absorbed food substance
- Thin epithelium for faster diffusion of digestible food; (1x3 = 3mks)

(e)
- To activate pepsinogen to pepsin
- To kill microorganisms present in ingested food/ its antiseptic
- Provides low PH for enzyme pepsin to act on(Any one (1x1=1mk)

4. (a) (i) Mother AO ✓1 Father BO ✓1 (1x2=2mks)
(ii) AB; ✓1 (1x1=1mk)

(b)



(1x4=4mks)

Blood groups for children AB, B, A and O ✓;

(c) Can receive blood from all other blood groups A, B, AB and O✓; (1x1=1mk)

5. (a) The rate of energy expenditure during complete rest of an organism is respiration when an organism is at rest; ✓ (1x1 = 1mk)

(b) (i) The buffalo consumed 53g/hr while the mouse consumed 1580 g/hrs; thus mouse consumed more oxygen than the buffalo;✓ (2x1 = 2mks)

(ii) The buffalo has a small surface area to volume ratio hence loses less heat; rate of respiration was low hence less oxygen consumed; (2x1=2mks)

the mouse has a large surface area to volume ratio hence looses more heat; rate of respiration was high hence more oxygen consumed; (2x1=2mks)

(c) Age, sex, health status (1mk)

Any one (1x1=1mk)

SECTION B (40 marks)

6. (a) On graph paper award as follows

Plotting all points correctly (1mk)

Smooth curve (1mk)

Axes (labeling) (2mks)

Scale (appropriate) (2mks)

(b) (i) No change in population of rats; rats are adjusting to the environment; rats are growing to sexual maturity (1mk)

(ii)

- Number of rats reproducing is high;
- Rapid increase in rat population/ exponential growth;
- Adequate food/ space/ absence of environmental resistance; (2mks)

(iii) Reduced growth rate;
Accumulation of wastes;
Food/ space have become limiting/ inadequate/ competition for resources; (2mks)

(iv)

- Decrease in rat population;
- Limiting factors set in/ inadequate food/ limited space
- Death rate is higher than birth rate;
- Maturity of rats had become aged/ not reproducing; (2mks)

(c) (i) 12 and 14 ; (1mk)

(ii) $Rate\ of\ pop.\ change = \frac{440-180}{2} = \frac{260}{2}; = 130\ rats/month$; (2mks)

(d) Using a sweep net capture as many grasshoppers as you can count mark and release them, record as first capture (FM); After 24 hrs, collect as many grasshoppers as possible; count and record as second capture (SC); Record the number of those with marks/ previously captured and marked as marked recapture (MR); then use the formula below to get population of grasshoppers $P = \frac{FM \times SC}{MR}$; (4mks)

7. Has cornified layer; made up of death cells that protect against mechanical damage/ entry of disease causing micro organisms; Granular layer; made up of living cells that give rise to the cornified layer; Malphigian layer; has actively dividing cells that give rise to the granular layer/ new epidermal cells; contains melanin that protects skin against ultraviolet rays; Has sweat glands; which produce sweat which evaporates thus cooling the body;
Sweat contains urea, water, sodium chloride thus skin is an excretory organ;
Presence of hairs; which stand erect to trap air to insulate body when temperature is low/ lies flat to allow heat loss when temperature is high;
Has nerve endings/ sensory cells; which are sensitive to stimuli/ heat/ cold/ touch/ pain/ pressure;
Subcutaneous fat/adipose tissue; insulate body against heat loss;
Sebaceous glands; secrete sebum an oily substance which is water repellant/ prevents drying/ cracking of skin/ keeping skin supple/ sebum is antiseptic which kills micro – organisms entering through the skin; Has blood vessel; that supply food/oxygen/ remove excretory products;
When temperatures are high blood vessels/ arterioles vasodilate to lose heat by convection/ radation/ vasoconstrict when temperature are low to conserve/ reduce heat loss; (20mks)

8. (a) (i) Natural selection – organisms with suitable variations in a population survives in a competition for resources; those with unsuitable variations die; suitable genes are passed on to offspring's/ unsuitable genes are eliminated from the population; (3mks)

(ii) Struggle for existence – as members of a species continue to increase it leads to overcrowding; hence competition for/ species; organisms have to struggle to avoid predators/ harsh environmental conditions; (3mks)

(b) Evidence of organic evolution
Fossils records; remains of dead organisms preserved naturally (within sediments); indicate that organisms have evolved from simple life forms (oldest fossils) to most complex life forms (recently formed fossils);

comparative anatomy; involves comparing the form and structure of different organisms; organisms which show basic structural similarities, homologous structures vertebrate (penta dactyl limb) suggest a common ancentry/ embryoric origin; these structures have been modified to adapt organisms to different ecological niches in a given habitat/ adaptive radiation; Some organisms have structures that perform same function but are from different embryoric origin/ ancestry/ analogous structures

Geographical distribution;

Us believed that long ago the land mass one / large land mass/ super continent; it later split to form present day continents/ continental only; organisms became isolated by physical barriers/ mountains/ rivers/ valleys/ oceans/ seas; hence underwent evolution in isolation leading to new species;

Comparative embryology; involves comparing of embryos of different organisms to find if they resemble/ related; embryos of fish, birds, amphibians, reptiles and mammals resemble/ similar during early stages of development; suggesting a common ancestry/ embryonic origin;

Cell biology;

Cells of higher organisms show basic similarities in their structures and functions suggesting a common ancestry; (14mks)