
KENYA NATIONAL EXAMINATION COUNCIL
REVISION MOCK EXAMS 2016
TOP NATIONAL SCHOOLS

MOI GIRLS NAIROBI
BIOLOGY
PAPER 2
MARKING SCHEME

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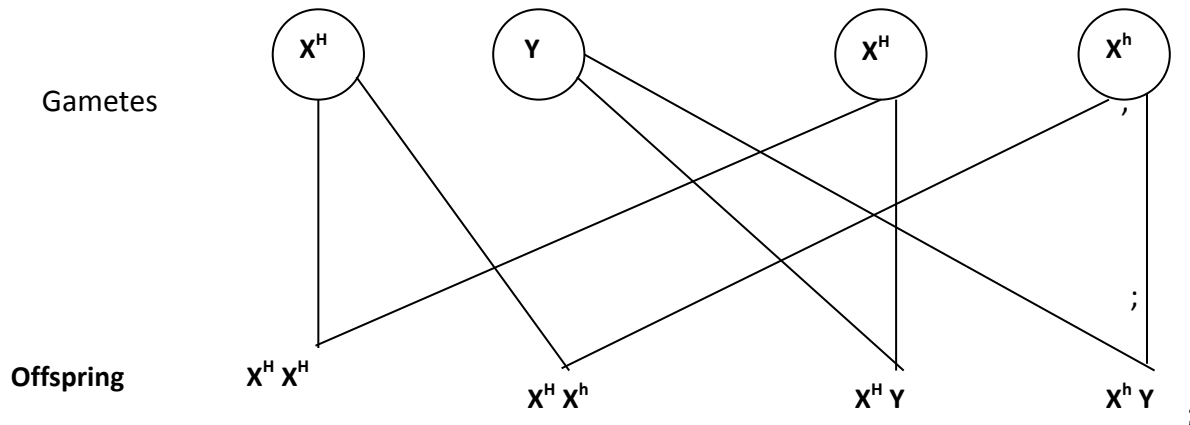
MOI GIRLS NAIROBI KCSE TRIAL AND PRACTICE EXAM 2016
BIOLOGY PAPER 231/2
MARKING SCHEME

1.a) Is a sudden change in the genetic make up of an individual;

ii) $X^H Y$; $X^H Y X^h$;

ii) parental phenotype: Normal blood clotting $X^H Y$ Normal blood clotting $X^H X^h$;

Parental genotype



c) Genes located on the same chromosome and are transmitted together;

2. a) The coleoptile tip bends towards light/positive phototropism/positively phototropic; more cells elongating/more growth on the side away from light; due to high auxin concentration on the side away from light;

b) B and C are control experimental set ups for A; shows that it is the tip that responds to light

shows that it is the tip of that is the source of growth hormones/auxins/1AA;

c) No curvature in D because hormones/Auxins/1AA from the tip do not reach region of cell elongation (due to mica blade); in E curvature occurred because mica blade does not interfere with the tip to region of cell elongation on the side away from light;

3.a) Isotonic solution;

b) Solution B was hypertonic; to potato cells. The cells lost water to solution B through osmosis; and became plasmolysed hence the reduction in length of the cylinder;

c) The cell would be haemolysed;

Acc cells would burst

ii) The solution is hypotonic to red blood cells; the cells would gain water by osmosis then swell and burst;

d) Active transport;

4. a) One male nucleus of the pollen grain fuse with the polar nuclei; to form triploid primary endosperm nucleus; while the other male nucleus fuse with the egg cell nucleus; to form the zygote; (that develop into embryo) (4mks)

b) i) Stimulates the synthesis/maturation of sperms;

ii) Stimulates the development of secondary male characteristics;

c) Fertilization of ovum is done in a test tube; and the fertilized ovum is transferred into mother's uterus;

d) Neisseria gonorrhea; (must be underlined) check spelling

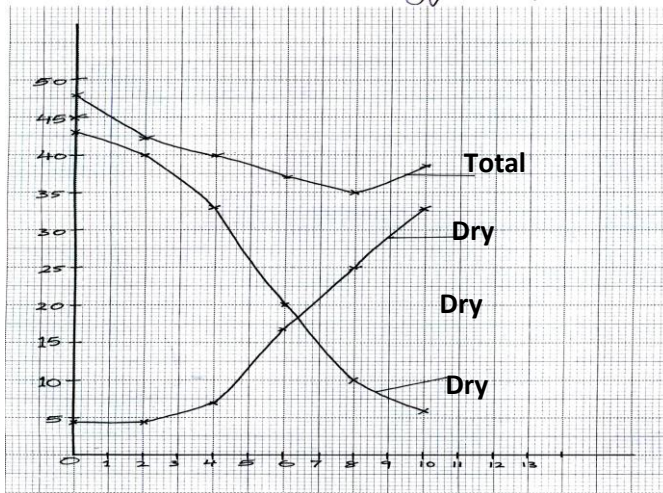
5.a) i) Presence of rings of chitin which keeps them always open;

ii) Moist epithelium for dissolution of respiratory gases;

b) i) alveoli;

- ii) gill filaments
- c) pneumatophores;
- d) i) Lactic acid is poisonous to tissues and must be removed; to increase supply of oxygen to tissues;
- ii) Oxyhaemoglobin; Acc $\text{HbO}_2/\text{HbO}_8$

SECTION B



- 6 b) 38.5mg; ± 0.5 Rej wrong units , Acc without units
- c) i) Hydrolysis of starch into simple sugar/glucose; which is translocated to the embryo; oxidation (of simple sugars) respiration to carbon (iv) oxide/energy/Heat
 - ii) New cells materials/tissue are synthesized (from proteins); bringing about growth of embryo;
 - iii) First leaf carried out photosynthesis (Leading to growth)
 - d) i) presence of abscisic acid; Acc presence of germination inhibitors.
Embryo not fully developed;
Absence of hormones/enzymes that stimulate germination; impermeable seed coat; (Any two)
 - ii) Unsuitable temperature/lack of suitable temp/ unfavourable temperature;
lack of water;
Absence of light;
Lack of Oxygen; any 2
 - e) Dense cytoplasm;
- Thin cell wall
-Absence of vacuoles

7. How mammalian heart is adapted to its function (20mks)
- The heart has atrioventricular/tricuspid and bicuspid valves and semi-lunar valves which allow blood to flow in one direction/prevent backflow of blood; valves have non-elastic chordae tendonea/ tendons which prevent atrioventricular valves from turning inside out into auricles during ventricular systole;
- The heart has thick muscular walls which contract to pump and push blood; The heart is made of cardiac muscles which are myogenic/contract and relax without fatigue; the heart has sino-atrio node and atrio-ventricular node which initiate the cardiac muscles impulses; hence stimulate the contraction of the atria and ventricles respectively;
 - The heart is served with vagus and sympathetic nerves which regulate the rate of heart beat; (depending on the body's physiological requirements) The cardiac muscles are served by coronary artery and coronary vein, coronary artery supplies oxygen/nutrients; to heart muscles whereas coronary vein remove metabolic wastes/carbon (iv) oxide;

- The heart has specialized interconnected cardiac purkinje fibres which spread the wave of excitation throughout the heart muscles; the heart has four chambers which hold blood briefly before it is pumped to the lungs and the rest of the body.
- The heart has a septum wall that prevents mixing of oxygenated blood (on the left side of the heart) from mixing with deoxygenated blood (on the right side of the heart) . The heart has venacava and pulmonary vein that transport blood to the auricles (from the rest of the body) and lungs respectively, The pulmonary artery and aorta transport blood to the lungs, and the rest of the body (respectively)
- The heart is enclosed by pericardium memberane which prevents it from overstretching, the pericardium secretes the pericardial fluid which lubricates the heart and reduce friction as the heart moves with the inner membrane; the pericardium is covered with a layer of fat that acts as shock absorber.

- 8.a) - Have thick, fleshy (succulent) and green stems; that are modified for water storage and photosynthesis; stomata are reduced in number/located in cavities on the epidermis(sunken stomata) / located mainly on lower part of leaf surface/Exhibit reversed stomata rhythm to minimize transpiration;
- Some are deep rooted; to enable them reach deep water table; others have superficial roots; to absorb surface water after a short shower; In some leaves are permanently folded; to prevent direct exposure of stomata to environmental conditions thus minimizing transpiration; Others shed off their leaves at the onset of dry season to minimize transpiration; in some leaves are small in size/reduced in size to scale-like structures to minimize transpiration; (12 max 10)
- b) -Plant cells have a cellulose cell wall; which is rigid; plants absorb water through osmosis and cells become turgid; which makes the tissues firm and erect; Collenchyma cells have thickened cell walls; to give strength; Xylem vessels have thick and lignified walls; that strengthen plants. Tracheids and fibres; in mature plants have dead thick lignified cells; for strength and support. Parenchyma cells are round and tightly packed together; which maintains shape and firmness; of the plants. (11 max 10)