KENYA NATIONAL EXAMINATION COUNCIL
REVISION MOCK EXAMS 2016
TOP NATIONAL SCHOOLS

SACHO 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

SACHO HIGH SCHOOL KCSE TRIAL AND PRACTICE EXAM 2016
PAPER 2
MARKING SCHEME

1. (a) (i) Juvenile hormone (1mk)
Function – forms larval cuticle/ inhibits moulting metamorphic effects of hormone in the larval stage (1mk)
(ii) Ecdysone / moulting hormone (1mk)
Function – moulting to allow growth and metamorphosis (1mk)
(b) Prothoracic gland (1mk)
(c) Metamorphosis/ incomplete metamorphosis (1mk)
(d) i) It reduces competition for food since they feed on different food substances
ii) Adapts the organism to escape adverse environmental conditions (2mks)

2. a) P – rings of chitin/ spiral bands (1mk)
Q – tracheoles (1mk)
b) Circular rings keep the trachea open when pressure is exerted inside the lumen is low (1mk)
c) Carbon (IV) oxide is of high concentration in the muscle tissue therefore it diffuses from the tissues into the tracheoles and moves to the trachea and out through the spiracles into the atmosphere (3mks)
d) – the walls are thin and lack chitin for rapid diffusion of gases (1mk)
- Walls are moist to dissolve gases (1mk)
- They are highly branched to increase the surface area for gaseous exchange

3. a) –To show that coarbon (IV) oxide is produced during anaerobic respiration. (1mk)
b) –There is production of bubbles in the boiling tube of carbon (IV) oxide leading to the formation of a white precipitate in the test tube containing calcium hydroxide solution. (2mks)
c) – Yeast cells undergo anaerobic respiration prodicing carbon (IV0 oxide gas which dissolves in calcium hydroxide solution forming a white precipitate; production of the gas results in bubbles
d) – To kill other micro-organisms present in glucose solution thus eliminating microbial respiration
e) – Through the use of glucose solution without yeast cells

4. a) 1- Insertion
2 – Deletion
3 – Substitution
4 – Invertion
b) i) Deletion, Duplication
ii) Non-disjuction
c) It involves provision of information and advice on genetically inherited disorders, their risks and outcomes

5. a) R- Liver
S – Stomach
T – Ileum
b) To label colon on the photograph
c) S – Site of initial protein digestion/ site for temporary storage of food
T – Site of completion of digestion and absorption
d) i) – Female
ii) – Presence of uterus
- Presence of foetus in uterus

6. a) i) Organic matter stimulates proliferation of saprophytic bacteria; that breakdown organic matter into soluble materials; thus a steady decrease in the amount of organic matter in the water downstream (3mks)

ii) The breakdown of organic matter by saprophytic bacteria releases nutrient ions e.g. sulphates and phosphates; increasing their concentration in the water (2mks)

iii) Saprophytic bacteria use up dissolved oxygen as they respire; decreasing the concentration of oxygen; as the level of organic matter declines downstream so does the activity of saprophytic bacteria; oxygen from air dissolves in the water returning its concentration to norma (4mks)

b) i) Between the point of sewage discharge and the point where organic matter returns to normal levels; fish population decreases drastically; this is due to lack of sufficient oxygen which the fish needs for respiration (3mks)

ii) About one and half km downstream from the point of sewage discharge; water plants and algea proliferation; this occurs due to the large number of nutrient ions released from the breakdown of organic matter by saprophytic bacteria; their numbers get back to normal downstream as the nutrients get exhausted (4mks)

c) – treatment of domestic waste before discharging into water bodies
- using biotechnology to treat waste
- banning use of phosphate based detergents
- replacing lead pipes with plactic pipes

7. a) Mesophytes
- Trees may grow very tall in forests ecosystem due to competition for light as vegetation is very dense
- Some plants are climbers which support themselves on large tree in an attempt to reach light
- Some plants are epiphytes growing on tree branches to reach light
- Some undergrowth plants have numerous chloroplasts which are sensitive to low light intensity to enable them carry out photosynthesis in low light intensity
- Many plants have leaf mosaic that minimise overlapping and overshadowing and increase exposure of leaves to light
- those in areas with adequate water supply posses broad leaves with thin cuticle and many stomata on both sides of the leaf to increase transpiration
- Those in dryer areas have fewer stomata w3hich are mainly located on the lower surface to reduce transpiration.
- Some which leave in wet areas have shallow roots to absorb less water
- Large tall trees have developed butress roots or prop roots for extra support.
- Those in dryer areas have deep roots to absorb water from water table
- Some have waxy and glossy surface to reflect light to reduce absorption of light hence reduce transpiration also to drip off rain water.

b) Halophytes
- They have roots that concentrate a lot of salts in their cells by active transport; to enable them off set osmotic imbalance and take in water by osmosis
- Some have salt glands that secretes excess salts
- Some have water storage tissues to store water that has been taken in.
- Some like mangrooves have pneumatophores which have lenticels for gaseous exchange
- Some mangrooves have stilt roots for extra anchorage in mudflats.
- Most halophytes are found growing close to the water surface to enable them get sufficient light for photosynthesis
- Those in deeper water have highly sensitive chloroplasts to photosynthesise under low light intensity
- Some e.g. coconut have fruits with large aerenchyma tissue to enable them float.

c) Hydrophytes
- Most emertgent and floating types have broad leaves with many stomata on upper surface to provide a large surface area for gaseous exchange

- Some submerged hydrophytes have leaves which are deeply dissected into thread- like straws to provide a large surface for absorption of maximum light for photosynthesis
- Some submerged hydrophytes have leaves with numerous and sensitive chloroplasts that synthesise under low light intensity
- Many hydrophytes have aerenchyma tissues filled with air to enable them float and store gases for gaseous exchange
- They have poorly developed roots that lack root hairs to reduce absorption of water
- Their flowers are raised above the water level to allow for pollination for submerged and emergent species

8. -The **sclerotic** layer which contains tough connective tissue fibres which helps it to support and protect the other parts of the eye ball.
-The **choroids** which contain many blood capillaries which supply oxygen and nutrients of the retina and removes metabolic wastes from eye.
-Its highly pigmented, to prevent reflection of light within the posterior chamber of the eye ball.
-The **retina** which contains photoreceptor cells called cones and rods. It is said to be the light sensitive part of the eye. Cones are adapted for light and colour vision while rods are adapted for dim light vision.
-The **vitreous humour**-Which is under turgor pressure. It helps to maintain the shape of the posterior chamber of the eye ball. It also plays an important part in the refraction of light rays enabling them to be focused on the retina.
-**The cornea**, transparent and curved which helps to play an important role in focusing of the image on the retina. It accounts for the largest refraction of light rays.
-**The aqueous humour** –Contains oxygen and nutrients, which nourish the cornea and the lens. It is under pressure thus helping to maintain the shape of the anterior chambers of the eye. It also plays a part in the refraction of light rays enabling them to be focused on the retina.
-**The Iris is heavily** pigment, to prevent entry of light into the eye except through its central aperture called the pupil. It contains circular and radial muscles which constrict or dilate the pupil depending on the intensity of light.
-**The lens** is elastic, therefore allows changes in its shape depending on the tension exerted through the suspensory ligaments. This enables it to bring light rays coming from either near or far objects into sharp focus on the forea.
-The ciliary's body Contains the ciliary muscles whose contraction and relaxation alters the tension exerted on the suspensory ligaments.
-This in turn alters the shape of the lens enabling it to focus for both near and distant objects.
-**The eyelids** which are movable and opaque structures can be closed through a reflex action to protect the eye from too much light or from foreign objects.
- **The eye muscles** help to move the eye ball within the orbit. The lateral rectus muscles move the eye up and down whole the oblique muscles, move the eyeball in its up and down movement.
-**The lachrymal gland** which continuously secretes a watery, saline and antiseptic fluid called tears. The tears moisten the cornea and wash foreign particles out of the eye.
-**The eyelashes,** which are many hairs, protect the eye from the entry of small foreign particles.
-**The eyebrows** raised portion of the skin above the eye, thickly covered with hair, whose functions are to prevent sweat and dust from entering the eye.