**MAGS JOINT EXAM**

**MARCH/APRIL 2020**

**231/1**

**BIOLOGY PAPER 1**

**MARKING SCHEME**

1. These are genes located on the sex chromosomes and are transmitted together with those determine sex. $1 mk$
2. (i) C – G – G – C – T – A – A – A – T – G – C – C $1 mk$

(ii) C – G – G – C – U – A – A – A – U – G – C – C $1 mk$

1.
* The growing and developing regions such as shoots, leaves, flowers, fruits and roots
* Storage organs or tissues such as tubers, corns, bulbs, rhizomes and seeds.
* The secretors organs such as nectar glands in some insect pollinated plants such as bananas

$any 3x1=3 mks$

1. (i) Deoxygenated and oxygenated blood do not mix

(ii) Blood is at a higher pressure once the heart pumps it twice.

 $2x1=2 mks$

1. (a)
* Number of limbs
* Presence and number of antennae
* Number of body parts

$3x1=3mks$

 (b)

 i) Bryophyta

 X – Seta

 Z – Rhizoid rej Rhizoids.

1. A species is a subset of genus i.e. one genus contains several species. $1x1=1 mk$
2. Magnification = $\frac{Length of drawing}{Length of real object}$ √1

= $\frac{3cm}{7cm}$ = 0.429 √1

X 0.43√1

$$1x3=3mks$$

1. Because it involves movement of solvent (water) molecules from their region of high concentration to region of low concentration across a semi permeable membrane.

$$1x1=1mk$$

1. (a) Microscopic algae mosquito larvae small fish large fish crocodile

***NB:*** *mark as a whole*

$1x1=1 mk$

(b)

100

Crocodile

950

Large fish

 $1x1=1 mk$

3,500

Small fish

8,900

Microscopic algae

Mosquito larvae

12,000

(c) i. Body size of the organism increase at each trophic level from the base as their numbers decrease.

 (ii). At each trophic level much of the energy obtained is lost in respiration thus fewer organisms can be supported at the succeeding level. $2 mks$

1. (a) Thin- To reduce distance for diffusion of gases.
* To reduce distance for sunlight to reach the photosynthetic cells.

$$1x1=1 mks$$

Broad – To provide large surface area for maximum light absorption.
$$1x1=1 mks$$

(b) Pepsin – Breaks down proteins into peptides.
 **1x1 =** $1 mks$

 Renin – Digests protein caseinogens in milk to casein (curd)

 $1x1=1mks$

1. (i) Moist o dissolve the diffusing gases across the respiratory surface. $ 2 mks$

(ii) Thin to reduce distance covered by diffusing gases i.e. for the gases to diffuse through short distance. $1mks$

(iii) Many palisade cells in a small area to enable them receive maximum sunlight.$ $

$1x1=1 mk$

1. (a) Water dispersal. $1x1= mk$

(b) i) Has a water proof endocarp for buoyancy. $2mks$**.**

 **ii)M**esocarp is fibrous and spongy to trap air.

1. This is because during humid day, there is low rate of sweating; since less water is lost from the body surface, leading to less heat loss through sweat hence body temperature tend to rise slightly.

$$1x2=2 mks$$

1. a ) i) Tracheoles.

 ii)Thin epithelium for respiratory gas to diffuse through a short distance;

 -Moist to dissolve respiratory gases.

 -numerous to increase surface area for gaseous exchange. **1x1=1 mk**

**b)** To create a steep diffusion gradient after transport of oxygen gas. 1 mk.

1. (i) Helps in the transport of proteins. $1 mk$

(ii) Manufacture of ribosomes $1 mk$

* Stomata;
* Lenticels of woodyplants
* Cuticles $3x1=3 mks$
1. (a) Pitfall trap

(b) For catching crawling animals.

* Distortion of parts of fossils during sedimentation hence can give wrong impression of the structure;
* There was several missing links of fossils records as some parts or whole organism decomposed, some scavenged upon and conditions may not be conducive for fossilization (O.W.T.T.E).
* Destruction of fossils by geological activities like earthquakes, faulting and mass movement.

 $3x1=3 mks$

1. Enzymes cofactors are non-proteinous substances which activate enzymes; while co-enzymes are organic non-protein molecules that work is association with particular enzymes. *(Mark as a whole)*

$2 mks$

* Cells have adjusted to the new environment
* Food and other factors are not limiting hence no competition for resources.
* Rate of cell increase is higher than cell death.
* There is an increase in the number of cells dividing

*First two*$ 1x2=2 mks$

* Latin language was widely spoken and used by scientists during his time;
* Local names used previously could not be understood by everyone thus Latin language enhanced scientific communication worldwide. $1x2=2 mks$
1.
* Excretion of waste products from the body cells.
* Absorption of digested food from alimentary canal of animals in the blood stream.
* Absorption of some minerals salt from soil by plant roots.
* Accumulation of substances into the body to offset osmotic imbalance in arid and saline environment.
* Reabsorption of sugars and some salts by the kidney. $3x1=3 mks$
* Oxygen concentration
* Presence or absence of hormones
* Substrate concentration
* Surface area to volume ratio/body size of an organism. $3x1=3 mks$
1. (a) Mature human ovum $1mk$

(b) X – follicle cell

Y – viteline membrane $1mk$

 W – Plasma membrane $1mk$

1. Some malaria plasmodium developed resistance; to chloroquine drug; through mutation; those resistant individuals transmit the characteristic to their offspring through reproduction thus establishing a new population of resistant forms. $2 mks$
2.
* It is long to provide large surface area for absorption.
* It is numerous to bring digested food into close contact with walls of the ileum for easier absorption.
* Highly coiled to slow down movement of food, allowing more time for absorption.
* Higher surface has large number of villi and micro-villi which increase the surface area for absorption of end products of digestion.
* Presence of thin layer of cells through which digested food diffuses.
* Presence of tense network of blood capillaries in villi into which nutrients are absorbed.
* Presence of lacteals in the villi for absorption of fatty acids and glycerol. $2x1=2 mks$
* Independent assortment
* Crossing over $2x1=2 mks$
1. Damage lead to failure of liver to produce bile; bile carries out emulsification of fats; 2 mks
2. i) Leukemia. 1 mk.

ii)Sickle cell Anaemia. 1 mk.

 30.a) Anaerobic respiration. (1 mk)

 b) Lactic acid. 1 mk.

 31 a) A- Hypogeal germination.

 B- Epigeal germination. 2 mks.

 b)Its used in oxidation of stored food substances in the seedto release energy for growth. (1 mk)

 c)Due to breakdown of stored food to yield energy for growth. (1 mk)

 d) i) It leads to formation of larval cuticle. (1 mk) ii) Corpora allata. (1 mk)