**END OF TERM TWO 2021 EXAMINATIONS**

**FORM FOUR BIOLOGY PAPER 2MARKING SCHEME**

1. (a)Osmosis; (1mk)

(b) (i) Isotonic solution; (1mk)

(ii) Hypotonic solution; (1mk)

(c)Feeding in insectivorous plants;

- Absorption of water from the soil;

-Support;

- Opening and closing of stomata;

(3mks) mark 1st three

(d) (i) Possession of electric charges /polarity; 1mk

9ii)Semi-permiability;1mk

2 (a)Moist surfaces;Rj moist alone

Numerous to increase surface area for gaseous exchange.

Highly vascularised;OWTTE.

Large surface area /enlongated;

Thin membrane /one cell thick; 2mks (mark 1st two)

(b)(i) From contaminated surfaces then transferred to mouth /nose/eyes;(through hands)

-Inhaling air contaminated with droplets and small particles containing the virus; 1 mk

(ii) (a)Filter out particles containing the virus from inhaled /exhaled air reducing infection; 1mk OWTEE

-Limit the volume and travel distance of expiratory droplets when talking or breathing ; OWTTE 1mk

(b)Kill the virus /soap dissolve virus lipid coat hence killing it ;1 mk

(c) (i)Medulla oblongata; (1mk

(ii)Mycobacterium tuberculosis; 1mk

3.(ii) Presence of abscisic acid /germination inhibators;

Embryo not fully developed;

Impermeamble seed coat;

-Embryo destroyed by pest;

Absence of growth promoters/

Enzymes that control germination;

Mark 1st three 3mks

(ii)Hydrolysis of stored food;

Transport medium ;

Soften seed coat;

Unfavourable temperature 2mks mark 1st two

(iii) The tip of the shoot containing auxin was removed ;apical growth takes place only at the tip under influence of auxin; Hence apical dorminance removed 3mks

4 . (a) (i)Anlogous structure; 1mk

(ii)convergent evolution; 1mk

(b)This is the process where nature selects organisms with favourable characteristics /traits well adapted to prevailing environmental conditions survive; reach adulthood and reproduce giving forth offsprings that inherit the favourable characteristics ;while those with unfavourable characteristics do not survive the competition die young and their genes are eliminated from nature; 3 mks

(c) (i)The malaria parasite (plasmodium) mutated and become resistant to the drug. This characteristics are transmitted to the offspring ;(survive in presence of the drug) 2mks

(iii)Erect posture/upright /bipedal gait;

-Enlarged brain capacity /higher intellectual capacity.

-Communication through speech /language

-Prehensible fore limb

-Binocular vision;

Mark 1sttwo 2mks

5.(a) (i)Mode -:Herbivory Rj herbivore

Reasons-:Lack of upper incisors/presence of a horny pad

-Presence of diastema;1mk

(ii)horny pad;1mk

b.(i) (paucreatic )Amylase;

(ii)trypsin;1mk

6.(a)Scale 2mks

Axis 2mks

Plotting 2mks

Curve 1mk

Labeling 1mk

8mks



(b)June ;rainfall highest so productivity per plant species highest / abundant food; so mammals eats its most favourable plant species only;3mks

(c)The number of plant species eaten is highest /high ;There is less rain during the months so less amount of food available /less productivity per plant species ;forcing the animals to eat a number of different species to meet its food requirement; (3mks)

(c)The animal is able to obtain its dairy fopod requirements irrespective of seasonal charges; 1mk

(d)Observe and record plant species eaten /Analyse the animals dropping ;Fistulation; 2mks

7..applicationof geneticknowledge today.

(i)Inbloodtransfusion.;

Bloodtyping ABantigenandrhesusantigen isnecessarytoensurecompatibility ofrecipient'sand donor's bloodtoprevent agglutination.;

ii)Geneticcounselling.:

Where couplesareadvisedonchancesofoffspring's inheriting hereditary disease~e.g. Sicklecell anemia, hemophilia, albinism etc.;

Alsosomehereditary disordersarescientifically explainecd e.g.hemolytic diseaseofthe newborn,

turners' syndrome andDownsyndrome. J

iii)Insolvingdisputed parentage.;

Theknowledge ofbloodgroupsinheritance andDNAmatching arebeingusedassupportive evidencein courtswhere parentage isdisputed.:,-

iv)Inplantsandanimal breeding.\_;

Bettercropsandlivestockareselectedthencrossedrespectively toproduce individuals with better . performance/ higherheterozygozity/ higherhybrid.;

v)Inmediciner

*I*

Inmedicine anorganismcalledEscherichiacoliE.coli hasbeenmodified toproduce a hormone called

somatotrophin forthetreatment ofdwarflsrn.z

/ .

Thefungus(yeast)hasbeenmodified toproduceanti-hepatitis-B vaccine.;

Insheepthere hasbeenmodification toproducemilkwith medicinal proteins torelief h~mophilia and

emphysema.; "

Ingenetherapy wherefaulty genesarereplacedwith normalonestocorrect genetic disorders'e.g. Lung

cysticfibrosis. ; '

vi)lntheenvironment.;

Agenetically modified pseudomonous bacterium capableofbreakingdown synthetic hydrocarbon has beendeveloped tocontrol pollution.;

vii)Incrimedetection.z

DNA/finger printing fromthesceneofcrimeandsuspectshairsorbloodsamplesorsemenfrom thesuspectshasbeenusedtoidentify criminals.;

viii) Incloning.;

Ithasbeenusedtoasexually(without fertilization) producing genetically identical offsprings e.gdolly thesheep.;Clonescan beusedtoproduce humanspareparts.;

ix)Inagriculture;

Intissueculture newvarieties ofpyrethrum, bananahasbeenproduced.

x]Ingenetic engineering.;

Desirable genes are identified,altered,isolated and transferred; (to another organism)

8.Xerophytes

-Roots extensively developed /superficial roots ;to provide large surface area;

Roots grow deep/long roots;to reach water source deep in the ground;

-Sacculent /fleshy/possession of water storage tissues ;to store water /to survive drought;

-possession of thick waxy cuticle;

-hairly leaves;sunken stomata;

Reduced leaf size /spines /scales/thorns/reduced number of stomata/needle shaped leaves;

Rolled leaves Acc folded leaves; shedding of leaves;

-rolled leaves Acc folded leaves;s hedding of leaves;

Reversed stomatal rhythm; to reduce rate of transpiration;

-short life cycle /quick growth after rain; to make use of available water quickly; 16mks max 13

Hydrophytes

Aerenchyma/air spaces /large intercellular spaces/long fibrous roots ;for bouyency/floating in water;

Poorly developed conducting tissue /xylem and phloem;plants obtain water by diffusion ;

Poorly developed supportive tissue (schlerenchyma;because water provide necessary support;

Upper epidermis of leaves have more stomata than the lower epidermis;for gaseous exchange /for increased rate of transpiration;

ACCb all stomata on the upper side 8mks.