MWALIMU EXAMINATIONS BUREAU

UCE RESOURCE MOCK EXAMINATIONS 2019

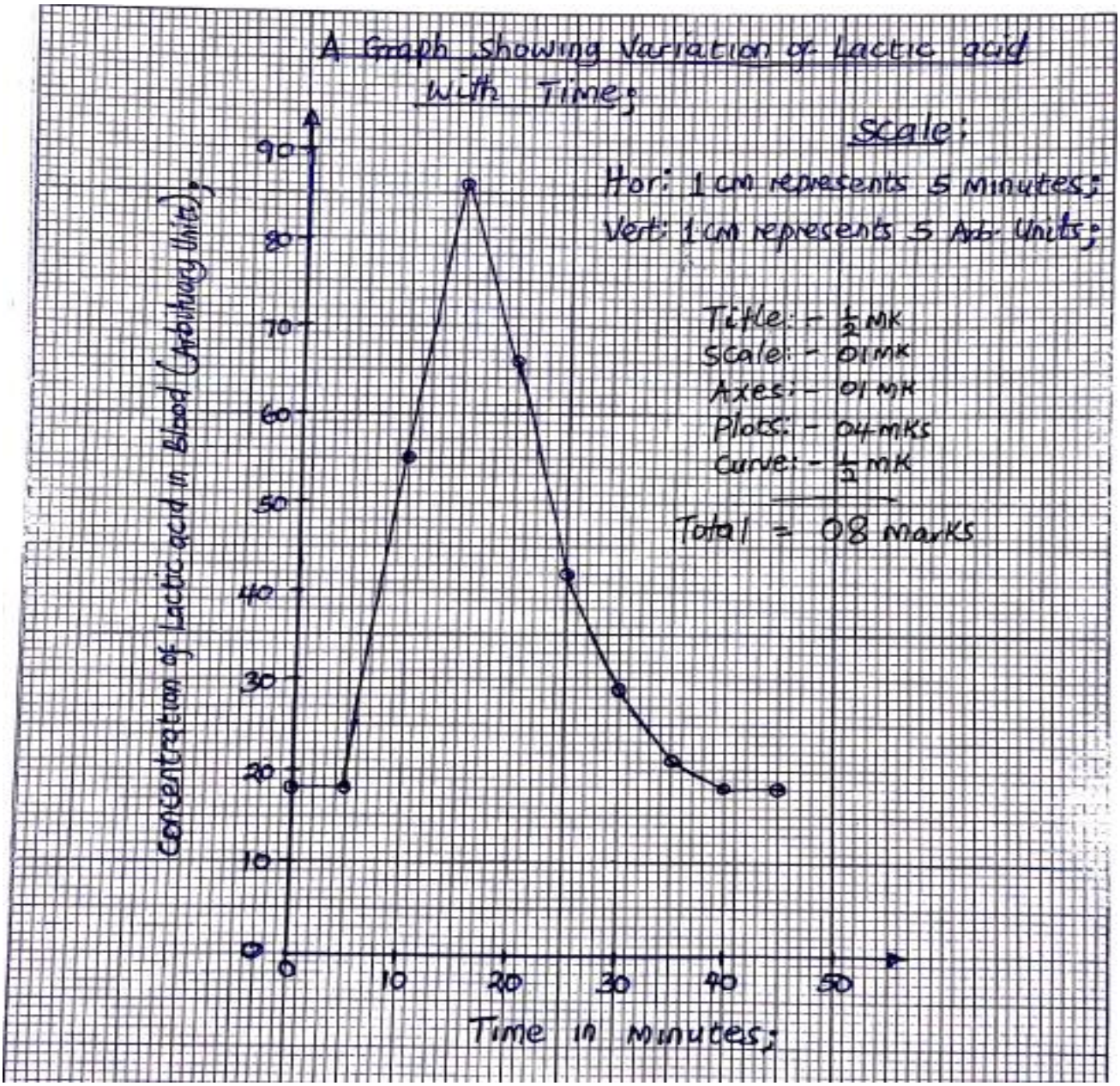
553/1 BIOLOGY GUIDE

SECTION A (30 MARKS)

1.	A	11.	C	21.	A
2.	B	12	A	22.	D
3.	D	13	B	23.	B
4.	B	14.	C	24.	C
5.	D	15.	B	25.	D
6.	B	16	A	26.	C
7.	C	17.	C	27.	B
8.	A	18.	C	28.	D
9.	C	19.	A	29.	D
10.	C	20	A	30.	C

SECTION B

31. (a) A GRAPH SHOWING VARIATION OF LACTIC ACID



(b) (i) - From 0 to 5 minutes**;** the concentration of lactic acid is constant**;**

- From 5 to 15 minutes**;** the concentration of lactic acid increases rapidly**;** up to a max of 86 units
- From 15 to 30 minutes**;** the concentration of lactic acid decreases rapidly**;**

- From 30 to 45 minutes**;** the concentration lactic acid decreases gradually**;** (04 Mks)

(ii) From 0 to 5 minutes the concentration of lactic acid remains constant because the athlete is carrying out aerobic respiration**;** then from 5 to 15 minutes the concentration of lactic acid increases rapidly because vigorous exercise leads to anaerobic respiration**;** due to high energy demand than oxygen supply**;** from 15 to 25 minutes**,** the concentration of lactic acid decrease gradually because active exercise has ended and rapid breathing occurs to supply oxygen for rapid breakdown of lactic acid**;** (01 Mk)

(c) (i) (40-45) = 25 minutes**;** (01 Mk)

(ii) -It rises to pump more blood (faster) to supply oxygen and nutrients to respiring cells for energy production**;** (01 Mk)

- The heart rate remains high due to oxygen debt in order to supply oxygen required to oxidized lactic acid**;** and drive blood rich in carbon dioxide from the tissues to large for re-oxygenation**;** (03 Mks)

(d) -More energy/ATP molecules are released**;**

- Complete breakdown of substrate /glucose**;**
- No/less toxic products are formed as opposed to anaerobic respiration which results to Ethanol, Lactic acid. Any one (01 Mk)

32. (a) (i) Active transport is the movement of molecules against a concentration gradient using energy**;** (inform of ATP) (01 Mk)

(ii)- Diffusion**;**

- Osmosis**;**
- Active transport**;** (01 Mk)

(b) (i) **W** - Cell wall**;**

X - Cytoplasm**;**

Y - Cell vacuole**;**

Z - Cell membrane**;** (02 Mks)

(ii) **W**- Is freely/fully permeable**;** to allow diffusion of various substances through it**;** (01Mk)

Y- It's filled up cell sap having high solute concentration; which creates osmotic pressure leading to absorption of solvent molecules by osmosis**;** (01Mk)

(c) (i) The root hair cells would lose/ water molecules to the concentrated solution**;** (01Mk)

(ii) The sodium chloride will exert a higher osmotic pressure**;** causing solvent molecules to more from the root hair cell by ex-osmosis**;** (01Mk)

(d) It's the difference in concentration of molecules between region of low concentration/dilute solution and region of high concentration/ conc. Solution**;** (01 Mk)

33. (a) (i) Nitrites**;** (½ Mk)

(ii) **A**- Atmospheric fixation**;** (1 ½ Mks)

B- Denitrifixation**;**

K- Decay/Decomposition**;**

(iii) Rhizabium**;** (01 Mk)

(b) (i) -Through leaching to deeper layers**;**

- Through Erosion**;**
- Vitalization**;**
- Absorption**;** Any two (01 Mk)

(c) -Manufacture of protein**;**

- Synthesis of chlorophyll**;**
- Manufacture of plant structures**;**
- Improves quality of leafy plant**;** Any three (01 Mk)
- Consistent of

SECTION C

34. (a) (i) Mutation is a sudden change in the genetic makeup/ constitution of an organism**;**

(01 Mk)

(ii) Bivalent is a pair of homologous chromosomes joined together at the chiasmata**;** (01Mk)

(b) (i) – The genes for spear shape and round shape are codominant**;** resulting into an intermediate which is oval shape (02 Mks)

(ii) Let S represent allele for spear shape leaves;

Let R represent allele for round shapes leaves;

Parent phenotype**:** Spear shape X**;** Round shape**;**

Parental genotype **:** S S X R R**;**

Meiosis**:** ;

Garmetes**:** S S R R ;

Rndom fertilization**:** ;

F_1 Genotypes **:** RS RS RS RS ;

F_1 Phenotypes **:** All oval shaped**;**

½ Mk @ (05 Mks)

(c) Selfing the F_1

Parent phenotype: Oval Shap X Oval shape;

Parental genotype : R S X ; R S;

Meiosis: ;

Garmetes: R S R S ;

Rndom fertilization: ;

F_2 Genotypes : RR; RS RS; SS ;

F_2 Phenotypes : Round shape; Oval shape; Spear shape;

Ratio : 1 : 2 : 1

½ Mk @ (06 Mks)

35. (a)- Pollution is the addition of substance/energy to the environment to such levels that cause harm to life;/lower quality of life (01 Mk)

(b) – Discharge of untreated sewage; cause entrophication; leading to reduced oxygen; light penetration and death of aquatic organisms

- Discharge of hot water/ industrial effluent; kill aquatic organisms;
- Excess use of fertilizers; changes P^H of the water/causes rapid algal growth; suffocating fish
- Excessive application of agrochemicals/ insecticides/ fungicides; pesticides; poison aquatic organisms;
- Dumping of domestic waste/garbage; cuts off oxygen supply; leading to death of aquatic organisms
- Oil spillage; cuts off oxygen supply;
- Use of detergents; leads to algal blooms; which kills aquatic organisms.
- Dumping of soil/silt; cuts off light penetration; hence reducing photosynthesis and vision;

Any 05 Points (10 Mks)

(c)- Treatment of sewage/industrial wastes before discharge;

- Control soil erosion by afforestation, contour ploughing; **Any four** (04 Mks)

- Use biological control of pests rather than chemicals;
- Sensitization/education of the masses;
- Enact street lows and regulations against water pollution;
- Deployment of persons around water bodies to patrol/ prevent dumping of waste;

36. (a) Disease transmitted — Mosquito

- Malaria; — Female Anopheles;
- Filariasis/Elephantiasis; — Culex;
- Yellow/Dengue fever; — Aedes/tiger; (03 Mks)

(b) – Has a proboscis; for piercing; sucking; and injecting saliva;

- Has salivary tube/ hypopharynx; for introducing saliava containing parasites into the host;
- Has wings; for fast flight/movement;
- Has antennae/ is highly sensitive to carbon dioxide/ heat from host; to easily locate the host;
- Has anticoagulant in saliva; to prevent clotting of blood as it sucks;
- Feeds at night; when host is less alert/asleep;
- Has sharp stylets; for cutting through host's skin;
- Is a secondary host; to complete the cycle of the parasite;
- It is light; to land on the host unnoticed;
- Has labrum/front lip; sucking blood; **Any 8 points ½mk@**

(c) – By sleeping under treated mosquito nets;

- Use of mosquito repellants;
- Use of anti malarial drugs;
- Removing empty containers around homesteads;
- Sensitization of the population;
- Spraying mosquitoes with insecticides;
- Clearing bushes around homesteads;
- Biological control/introducing fish in ponds;

- Pouring oil on stagnant water**;**
- Closing doors and windows early enough**;**
- Draining away stagnant water**;**
- Putting wire mesh in ventilators, windows, doors**;**
- Wearing clothes covering most/all body parts**;**
- Painting houses with white/bright colours**;** **Any four** (04 Mks)

37. (a)- Homeostasis is the maintenance of a constant**;** internal environment of an organisms**;** (02Mks)

(b) The liver is a metabolic centre performing many metabolic reactions**;** and so generates much heat**;** which is distributed to various parts by blood**;** for maintaining a constant body temperature**;** (02 Mks)

(c) – When the sugar level raises above the normal (about 90mg/100cc)**;** the anterior lobe of the pituitary gland**;** stimulates the islets of langerhans**;** to create insulin**;** which causes rapid oxidation of glucose to generate energy**;** conversion of excess glucose to glycogen**;** stored in the liver cells and skeletal muscles**;**

When the sugar level drops below normal**;** the pituitary gland stimulates the islets of langerhans**;** which causes a reduction in the metabolic rate**;** and conversion of stored glycogen/fats to glucose**;** then sugar level raises back to normal**;**

End