THE UNITED REPUBLIC OF TANZANIA
DODOMA REGION
FORM FOUR MOCK EXAMINATION AUGUST, 2023
033/1 BIOLOGY 1- MARKING SCHEME

1. @1 mark=10 marks

I	Ii	Iii	Iv	v	Vi	vii	Viii	ix	X
C	A	A	B	C	D	C	A	B	C

2. @1mark=6 marks

LIST A	I	Ii	iii	iv	V	Vi
LIST B	E	G	J	F	H	I

Total=16 marks

3. (a) Homologous structures –structures with common origin but modified for different functions for example pentadactyl limbs mammals

Analogous structures – structures with no common origin but have evolved to perform same function

@1.5 =03 marks

(b) (i) divergent evolution

(ii) Convergent evolution

(iii) Divergent evolution

(iv) Convergent evolution

@1.5 = 06 marks total =9marks

4. (a) Factor that aid in ultrafiltration

i. Afferent vessels is wider than efferent vessels
ii. Blood enter glomerular at high pressure
iii. Glomerular is made up of thin capillary wall for easy diffusion

@1mark=3marks

(b) Explain the following

(i) Plasma proteins are large molecules which cannot pass through the small pores of the glomerulus.

(ii) All glucose is re-absorbed at the proximal convoluted tubules.

(iii) In cold days, one does not produce sweat, so all the excess water is lost as urine.

@1mark=3marks

(c) Adaptations of proximal convoluted tubules.

. Has thin epithelial lining.

. Have microvillus to increase the surface area for re-absorption.

. Coiled to reduce speed of flow of glomerulus filtrate.

@ 1mark=3marks

5(a) (i) mitosis is the type of cell division which produces two daughter cell with the same number of chromosomes as the parental cell.@ 1mark

(ii) significance of mitosis

cell replacement

growth

regeneration

asexual reproduction

genetics @1mark=5marks

(b) (i) Complete metamorphosis, is the type of growth process in which an insect develops through four stages namely;

Egg-larvae-pupa-adult (imago) eg. Butterfly

(ii) Incomplete metamorphosis is the type of growth process in which an insect develops through three stages namely;

Egg-nymph-adult (imago) e.g. Cockroach

(iii) Ecdysis, is the shading of the outer exoskeleton of an insect exposing new soft exoskeleton.eg cockroach@1mark=3marks total=9marks

6 (a) 3 Adaptations of the leaf for photosynthesis

has stomata to increase surface area for gaseous exchange

broad lamina for maximum absorption of light

has cuticle to act as water proof

Presence of palisade and mesophyll cells which have high number of chloroplast for maximum absorption of sunlight.

(any 3 @ 1mark=3marks)

(b) Effect of the following in the rate of photosynthesis

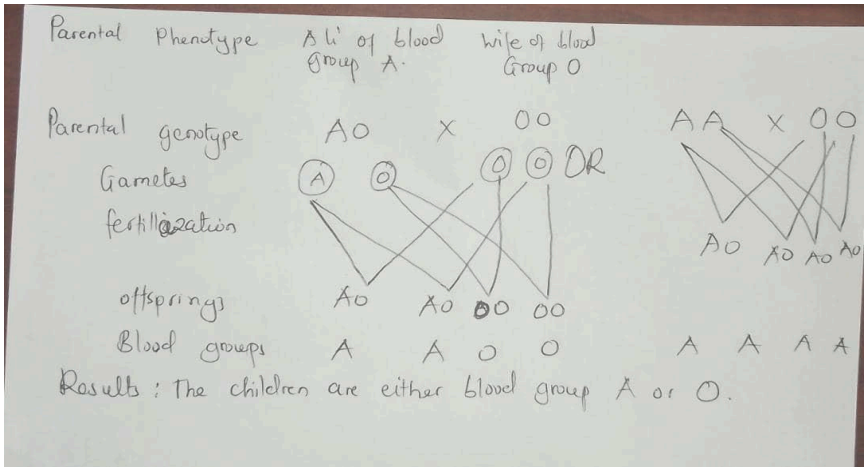
(i) Chlorophyll the higher the number of chlorophyll the higher the rate of photosynthesis since much light will be absorbed by chlorophyll.

(ii) Sunlight, the higher the light intensity the higher the rate of photosynthesis since photolysis will take place in higher rate.

(iii) Carbon dioxide, the higher the concentration of carbon dioxide in the atmosphere the higher the rate of photosynthesis.@ 2marks=6marks

7. Possibility of Ali's family being the parent of Leila

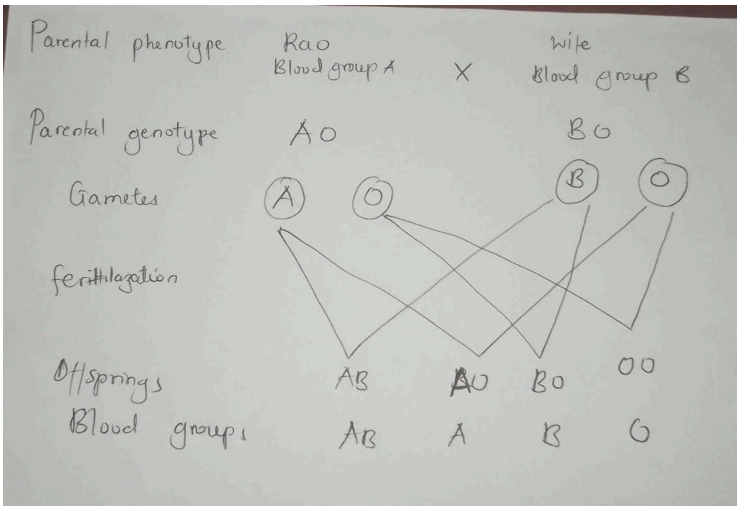
Ali can either have genotype AA or AO. If the wife has blood group O then there is no way they can sire the child with blood group AB.



@ 04 marks

Possibility of Rao pinto being the father of the child

- Rao can have genotype AA or AO. The wife can have genotype BB or BO.
- Possibility of them producing child with blood group AB is shown below.
- Assume they were both heterozygous



@04 marks

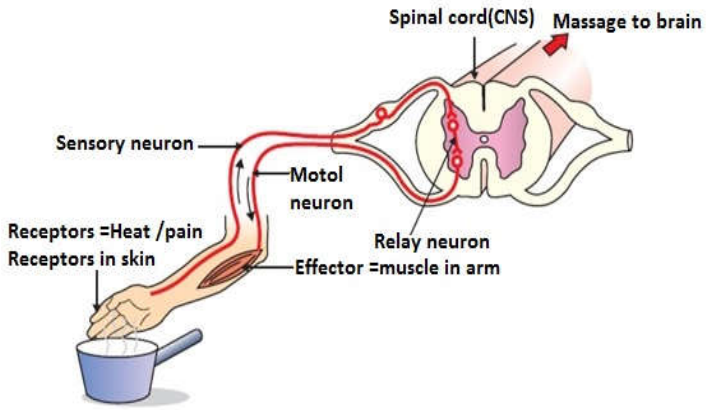
The likely biological parent of Leila are Pinto and his Wife. 01 marks

8. (a) (i) Reflex action

(ii) Reflex arc @ 1.5 = 3

(b) Caption =01

Any four labeling 04 marks



SECTION C (30 MARKS)

9. Mechanism of gaseous exchange on alveolus with the aid of diagram

Actual gaseous exchange on of oxygen and carbon dioxide occurs in the alveolus

The alveoli are surrounded by the network of blood capillaries. When breathing in air with high concentration of oxygen gas accumulates in the alveoli than in the blood stream; this causes oxygen gas to diffuse out of the alveoli into the blood in the capillaries where if combine with hemoglobin to form Oxyhemoglobin complex which the transport oxygen gas to the tissue 02 mark

At the tissues the oxyhemoglobin breaks and release oxygen and hemoglobin. The tissues uses oxygen and release carbon dioxide gas 02 mark

Production of CO_2 (g) by the tissues causes the rise in the level of CO_2 (g) in the tissues than in the blood 02 mark

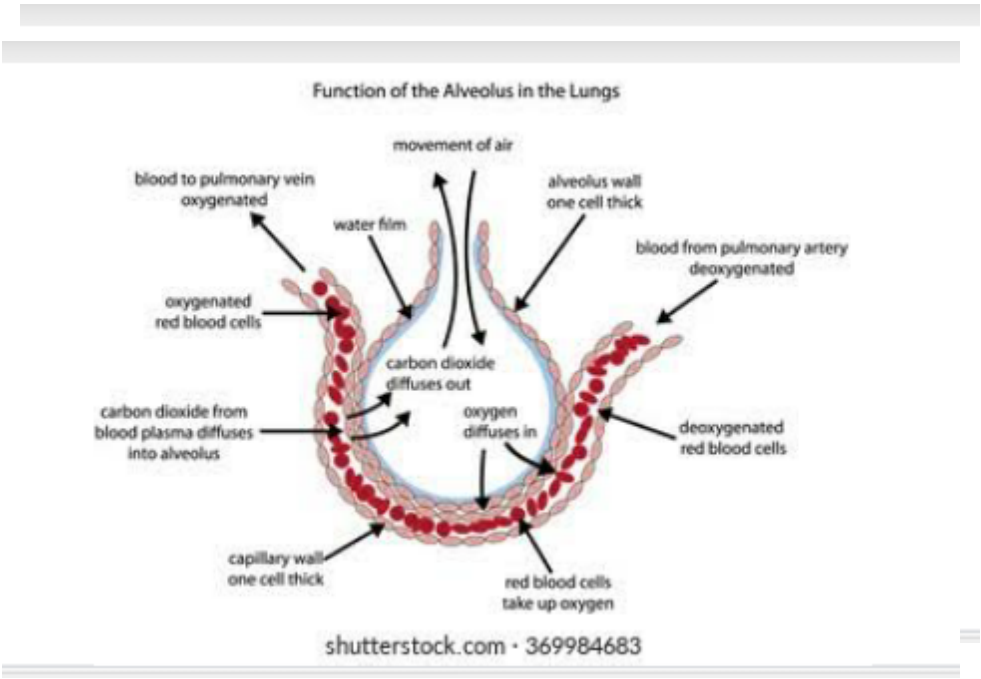
CO_2 (g) then diffuses into the blood stream where it combines with hemoglobin to form carbomino haemoglobin 02 mark

The capillaries transport CO_2 (g) in this form to the alveoli.

The concentration of CO2(g) higher I the blood at this movement than in the air in the alveoli and hence cause diffusion of CO_2 (g) from the blood into the alveoli. CO_2 (g) is then transported to the atmosphere through bronchioles, glottis, pharynx and finally nostrils. 02

marks.

Diagram of alveolus showing O2(g) and Co2(g) exchanges (05mark for drawings 04 marks for the sketch



10. (Any relevant introduction 2marks)

Advantages of coniferophyte

-conifers are source of timber

-source of pulp in the manufacture of papers

-some used for decoration at home

-pine leaves are source of food for some animals

-they produce good smell during winter (@ 1.5marks=7.5 marks)

. Disadvantages of conifers

-Pines have extensive roots that dry the soil and affect the growth of other plants

-They have high concentrations of resins which cause forest fires to spread fast.

-They have needle like leaves that can cause pain and injury. (@ 1.5 marks=4.5 marks)

(Any relevant conclusion@ 1 mark) Total=15marks

11. Any relevant introduction (1.5)

(a) Implants

- These are medical devices that are used to prevent pregnancy by preventing ovulation, and hindering implantation hence the embryo cannot be implanted.

(b) Rhythm (calendar) method

-This is the form of natural family planning. Is used to track the menstrual history to predict when one will ovulate. This helps to determine when conception is mostly to occur hence a person uses other pre-Cautions or abstain from sex.

(c) Coitus interruption (withdraw)

-This is done when a man removes his penis from the vagina before he ejaculates, This when well used it prevents conception in 70%.

(d) Condom

-This is the thin rubber sheath, which prevents sperm from entering the female tract. Hence conception is prevented.

(e) Diaphragm

-This is circular dome made of thin soft silicone that is inserted into the vagina before sex It covers the cervix so sperm cannot get into the womb (uterus) to fertilize an egg. When used with spermicides, diaphragm is 92-96% effective at preventing pregnancy.

(@2.5 marks=12.5 marks)

(any relevant conclusion @ 1marks Total =15marks