

WAKISSHA JOINT MOCK EXAMINATIONS

JULY/AUGUST: _____

CANDIDATE'S NAME: INDEX No.....

SUBJECT: PAPER: SIGNATURE.....

O&A

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2023 - MARKING GUIDE FOR WAKISSHA - UCE BIOLOGY

BY WASSWA ENOCK

0701300439 / 0762867639

SECTION A

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

SECTION B (40 marks)

Reject wrong titles against

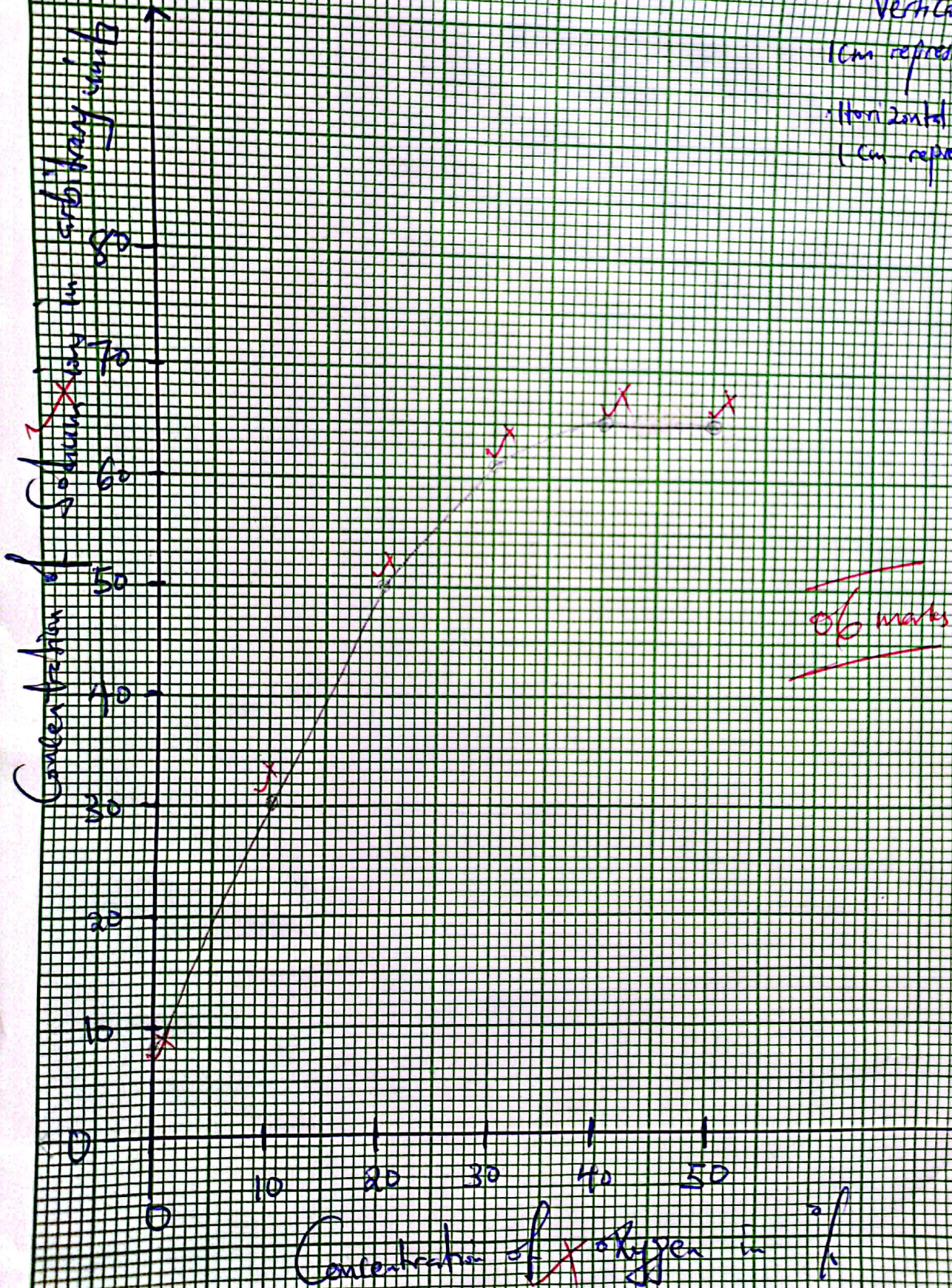
A graph showing the variation of Concentration of Sodium ions with Concentration of oxygen in Culture Solution

Vertical Scale

1 cm represents 5 units

Horizontal Scale

1 cm represents 5%



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(b) Describe the shape of the graph you have plotted (3 marks)

From 0% to 20%, Concentration of Sodium ions increases rapidly.

From 20% to 40%, Concentration of Sodium ions increases gradually.

From 40% to 50%, Concentration of Sodium ions remains constant.

(c) Explain the effect oxygen concentration on the absorption of Sodium ions by the plant.

Rapid increase; Oxygen is used to oxidize sugars/glucose during aerobic respiration forming energy, used during active pumping of Sodium ions into the root hair from the soil particles.

Gradual increase, This is due to reduction/decrease in amount of energy required for active pumping of Sodium ions, as result of decrease in sugar concentration in the root hair cells, also may be due to inhibition of some respiratory enzymes by excess Carbon dioxide formed. Also some enzymes were poisoned by too much oxygen.

Constant Concentration of Sodium ions, this is due to depletion of energy for active pumping, as most of the enzymes have been inhibited by accumulated Carbon dioxide. Some were poisoned by too much oxygen. Sugars also got depleted.

Total = 07 marks

(d) High Sugar Concentration / Glucose Concentration / Substrate Concentration ✓
High Enzyme Concentration ✓
Optimum temperature ✓
Total = 03 marks(e) Active transport ✓
Reject Diffusion, Facilitated diffusion.

(f) (i) Across the cell membrane ✓

(ii) At the proximal convoluted tubule of kidney nephron

(iii) In the internal lining of the small intestine / ileum

Total = 02 marks



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N032

(a)

$$\frac{20 + 06 + 13}{3} \quad \checkmark$$

$$= 13\% \quad \checkmark$$

(ol mark)

(b)

Soil type A Sand soil ✓

Reason

This is because it has large spaces existing between the particles

Soil type B Clay soil ✓

It has small spaces existing between soil particles

Soil type C Loam soil ✓

~~It moderately~~ It has moderate spaces between particles.

(ol mark)



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(c)

Soil type A ✓

Reason; Presence of large spaces existing
between particles. ✓
0/1 mark)

(d)

Loam soil ✓

Reason; Has Moderate aeration, and drainage,
Capillarity ✓ and this promotes plant growth. ✓
0/2 marks

NO33 (a)

(i)

Cell wall ✓

(ii)

Food vacuole ✓

(iii)

Cell membrane ✓

(iv)

Cytoplasm ✓

~~(v)~~

~~Nucleus~~

0/2 marks

(b)

Palisade mesophyll layer ✓



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NO 33(C)

- Numerous chloroplasts with chlorophyll - this increases surface area for trapping sunlight

- Thin cell wall, which enables exchange of materials for example diffusion of Carbon dioxide

- Has a nucleus

- Presence of a nucleus, which controls the cell activities

Award for any two structural features 4 marks

NO 33(Cd)

Athlet Athet

NO 33(Cd)

Athletic activities for example running, sprinting involves use of energy. Therefore he/she should double intake of Carbohydrate to ensure adequate supply of energy for continuous contraction and relaxation of muscles.

Total 03 marks



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SECTION C

NO 34 a)

- The trachea, made up of incomplete rings of cartilage which resist collapse during inhalation and exhalation.

- The inner lining of trachea, has cilia which produce mucus that traps and filters microorganism preventing them from reaching lungs.

- The trachea branches into two tubes called bronchi which penetrate further into the lungs.

- The bronchi divides into small tubes called bronchioles which increases surface area for movement of air into lungs.

- The bronchioles lack cartilage increasing surface area for movement of air into alveoli.

- ~~Has the inter~~ Presence of intercostal muscles in between the ribs which contracts and relaxes enabling inhalation and exhalation activities.

- Presence of diaphragm which moves upwards and downwards enabling movements of air.

~~Not~~ Award only

Total = 6 marks



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No 34
(b)

Outline the mechanism of Ventilation in Man.

- During inhalation / Inspiration / breathing in
- The external intercostal Muscles Contract while the internal intercostal muscles relax. ✓
 - This makes the rib cage to move outwards and upwards.
 - The diaphragm Contracts and flattens. ✓
 - This increases the Volume of the thoracic cavity and reduces the pressure in it below that of the atmosphere. ✓
 - Then Air moves into the lungs, through the nostril, trachea, bronchi, and bronchioles until it reaches the alveoli. ✓

During exhalation / expiration / breathing out.

- The external intercostal muscles relax, while the internal intercostal muscles Contract. ✓
- This makes the rib cage to move downwards and inwards. ✓
- The diaphragm muscles relax and the diaphragm returns to its dome shape. ✓
- The Volume of the thoracic cavity reduces and pressure increases beyond the atmospheric pressure. ✓
- This forces the lungs to Contract and release air out of the lungs through the bronchi, trachea and nostrils. ✓

Total 09 marks



N035 (a)

In Hypogeal germination, the Cotyledons remain underground ✓ while in Epigeal germination, the Cotyledons appear above the ground.

award only for stated difference

Reject it wrong difference stated This is because during hypogeal germination, the epicotyls grows faster than hypocotyls (hypocotyle)

But for Epigeal germination, the hypocotyls grow rapidly making the Cotyledons appear above the ground.

total 2 off marks

(b)

Conditions for germination -

- (i) Water ✓
- (ii) Oxygen ✓
- (iii) Warmth ✓

(c)

total 2 off marks

Series of events that lead to germination of a maize seed

- During germination, a seed takes in water from the soil, by imbibition ✓ through the micophyle. This makes the Cotyledons swell and the testa split ✓
- The absorbed water activates enzymes ✓ responsible for hydrolysis, ~~for example the~~ this leads to breaking of food materials eg starch, proteins and lipids ✓, which are stored in the endosperm.



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The soluble food materials are trapped to the growing points of the ~~can~~ embryo where they are used to provide energy and making of new cells.

- The radical is the first to ~~emerge~~ emerge, it grows downwards between soil particles and the root hair develop

- Absorption of water from the soil results into increase in the size of the seed and growth of radicles and plumule.

Max = 9 1/2 marks)
Award only 08 marks

No 36

(a)
Soil degradation is the physical, chemical and biological decline in soil quality.

(b)

Deforestation

- Cutting of trees, and vegetation, leaves the soil bare, exposed to wind and rain. This makes soil vulnerable to being away; and prone to soil erosion; ~~reducing~~

- Results into soil infertility as top fertile soil nutrients are washed away by running water.

Award only correct 02 marks



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(i) Over application of ~~inorganic~~ fertilizers.

— Disrupt the natural balance of ~~nutrients~~ in the soil, leading to nutrient imbalances and ~~reduced~~ soil fertility

total 5 marks

(c)

— By ~~mulching~~, that involves covering the top soil by using dry ^{Plant} material

— By ^(Afforestation) ~~Planting~~ Vegetation, this involves planting crops with deep roots that can hold the soil in place

— ~~Contour~~ ^{ploughing}; Ploughing along Contours

— Terracing, ~~Cultivation~~ along Contours in horizontal strips supported by stones

— Strip ^{P.} ~~Cropping~~, consists of alternate bands of Cultivated and uncultivated soil, following Contours.

total only correct 5 marks

total 20 marks



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36(d)

Effects of Soil Erosion

- Nutrients and soil organisms are carried away in the top soil. ✓
- The soil left behind is unproductive. ✓
- Fields may be cut into irregular pieces by rill and gully erosion. ✓
- Floods carry away crops and soil organisms. ✓
- It also decreases the soil's ability to hold water. ✓

Ans = 5 marks



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No 37(a)

~~Allele is~~ An allele refers to alternative form of the same gene.

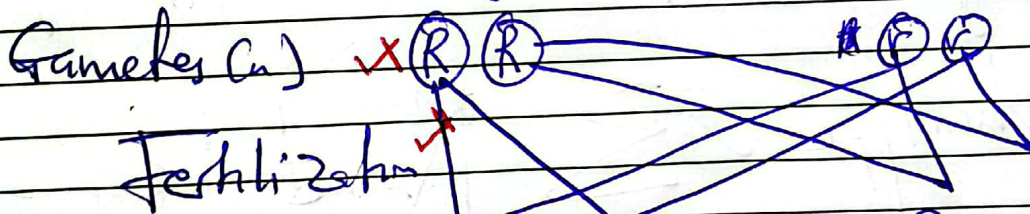
No 37(b)(i)

let R be the allele for round seed shape

let r be the allele for wrinkled seed shape

Parental phenotype; ~~RR~~ Round seed shaped plant X wrinkled pea seed shaped plant

Parental genotype RR X rr



F1 genotype Rr Rr Rr Rr

F1 phenotypes, All round pea seed shaped plant

Total 205 marks



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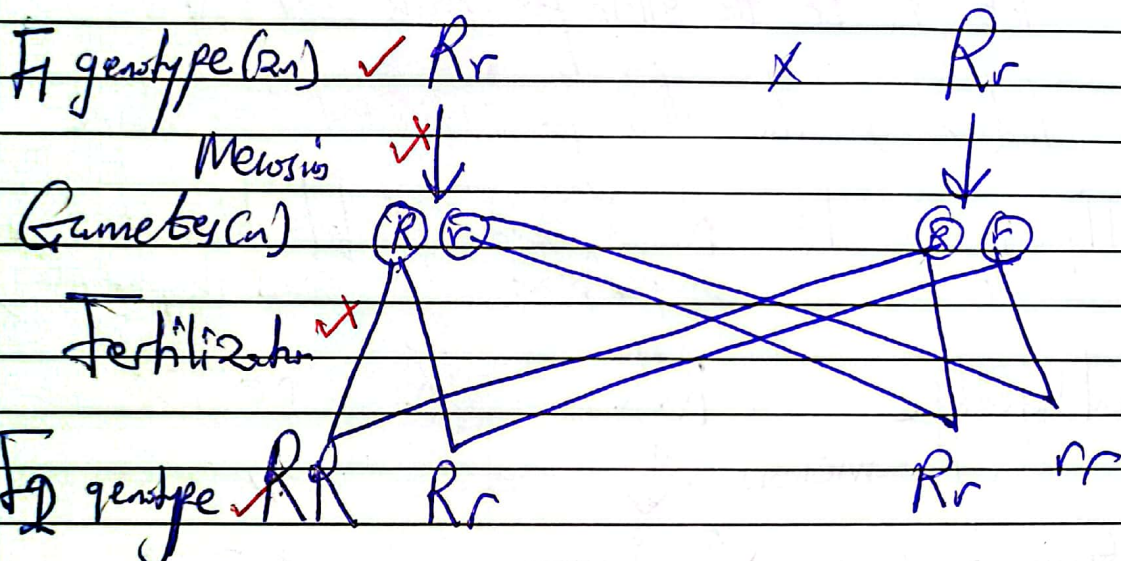
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Cii)

In generation, this is done by selfing
Selfing F_1 generation.

F_1 phenotype; ✓ Round pea seed shaped plant ✗ Wrinkled pea seed shaped plant



F_2 phenotype ✓ 3 Round pea seed shaped plant

1 Wrinkled pea seed shaped plant

Ratio = 3 : 1 ✓



Total 06 marks

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(C) Application of genetics

- The study of genetics encourages breeding of animals with good characteristics to improve livestock
- It helps to eliminate or reduce harmful characteristics through the study of genetics
- Through genetic Counseling and advice individuals may be advised on the possibility of their offsprings
- It helps in prediction of offspring from two mating individuals and solves problems like Fraternal uncertainty.

03 marks

"WASSWA ENOCK" Always