PRESIDENTS OFFICE		
MWANZA CITY COUNCIL		
MAHINA, MUHANDU, MBUGANI JOINT EXAMINATION, MAY 2025		
SUBJECT	**CODE**	**TIME**
BIOLOGY	033	3:00 HOURS

Instructions:

1. This paper consists of section A, B and C with a total of eleven (11) questions.
2. Answer all question in section A and B and two (2) questions from section C
3. Section A carries sixteen (16 Marks), section B fifty – four (54 Marks) and Section C carries thirty (30 Marks)
4. Write your Examination Number on every page of your answer sheet (s)

SECTION A: (16 Marks)

Answer all questions in this section

1. For each of the items (i) – (x), choose the correct answer from the given alternatives and write its letter besides the item number in the answer sheet provided

   i. What is the main respiratory surface for gaseous exchange in a tadpole during its aquatic stage?

   A. Lungs C. Book lungs E. spiracles
   B. Gills D. Skin

   ii. Which combination of environmental conditions is most suitable for the germination of maize seeds in a school laboratory experiment?

   A. Water, temperature and food
   B. Water and carbon-dioxide
   C. Soil, oxygen and water
   D. Temperature, soil and water
   E. Water, temperature and oxygen

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   iii. Which one is the feature of ageing in human being?

   A. Strong bones D. Body increase in size
   B. Strong muscles E. Clear eye vision
   C. Wrinkling of the skin

   iv. Which of the following shows correct chemical composition of deoxyribonucleic Acid DNA?

   A. Deoxyribose, Uracil, guanine and phosphate group
   B. Phosphate group, Deoxyribose, Themine and Uracil
   C. Deoxyribose, Adenine, Ribose and phosphate group
   D. Uracil, phosphate group, cytosine and Deoxyribose
   E. Phosphate group, Deoxyribose, cytosine and adenine

v. Why is it important to construct an incinerator at every hospital and health centre?
   A. To store medical waste safely
   B. To prevent spread of infection from medical waste
   C. To dispose of water waste effectively
   D. To recycle used hospital equipment
   E. To preserve surgical materials

vi. Why are skeletal muscles usually found in opposing pairs?
   A. One muscle alone can not extend a joint
   B. Muscles can only work by contraction
   C. One muscle alone can not flex a joint
   D. Paired muscles are stronger
   E. Muscle normally work in antagonistic fashion

vii. Hypertonic and hypotonic solution differs in that
   A. Hypertonic has high water potential and hypotonic has low water
   B. Hypertonic loses water and hypotonic solution absorbs water
   C. Hypertonic has low water and hypotonic has high water potential
   D. Both hypertonic and hypotonic solution has equal water potential
   E. Both absorbs water

viii. If a girl has menstruation on 12th August 2025, when would she experience ovulation period, if she has 28-day cycle.
   A. 21st September 2025
   B. 8th September 2025
   C. 31st August 2025
   D. 25th August 2025
   E. 1st September 2025

ix. If you stepped on a thorn barefooted, you would feel share stinging pain. Which of the following would be responsible for the detection of the stimulus?
   A. Afferent neurone
   B. Efferent neurone
   C. Intermediate neurone
   D. Relay neurone
   E. Efferent organ

x. What are the end product of digestion of the food substance resulting from eating sugar cane?
   A. Sucrose and maltose
   B. Maltose and glucose
   C. Fructose and galactose
   D. Glucose and fructose
   E. Galactose and fructose

2. Match the function of component of the skeleton in List A with the corresponding components of the skeleton in List B by writing the letter of correct response beside the item number in the answer sheet

LIST A	LIST B
i) Axial component which protects the delicate internal organs such as lungs and the heart	A. Pivot
ii) Axial component which protects the brain and provides area for attachment of the neck	B. Vertebral column
iii) Appendicular component which provides large surface area for muscle attachment and a base for articulation with hind limbs	C. Lumbar vertebrae
iv) Axial component which protects the spinal cord	D. Pelvic girdle
v) Appendicular component which provides large area for muscle attachment and a base for articulation with upper arms bones	E. Cervical vertebrae
vi) Axial component which supports weight of the upper body and enables a range of movements such as bending and twisting	F. Skull
	G. Pectoral girdle
	H. Ribcage

SECTION B: 54 Marks

Answer all questions in this section

3. a) What hormone is responsible for each of the biological processes in humans?
   i) Development of female sexual characteristics
   ii) Preparing the body to respond quickly (fight or flight response)
   iii) Increasing the concentration of glucose in the blood during stress or fasting.
   iv) Triggering concentrations during childbirth

   b) How does nervous coordination differ from hormonal coordination in the human body? Give five differences with relevant examples.

4. a) During a biology field trip to Mikumi National Park, students observed vultures, antelope, shrubs, cheetah and wildebeest.
   i) Construct a food web
   ii) Construct two food chain using the organisms observed during the trip

   b) Why are the mothers adviced to breast feed their babies instead of using bottle feeding? (5 points)

5. a) What physiological response occur in the human body in the following situations?
   i) When the body is exposed to cold environment (3 points)
   ii) When the body is exposed to high environmental temperature (3 points)

   b) What are the three (3) biological advantages of an organism being homoeothermic?

6. A plant breeder crossed a pure breeding pea plant with round seeds (dominant trait) with a pure – breeding pea plant with wrinkled seeds (recessive trait)
   a) What are the genotypes and phenotypes of the offspring in F1 and F2 generation.
   b) What are the genotypic and phenotypic ratios expected in the F2 generation?
7. a) Mrs. Kidoubs-like structures. Mrs. Kidoubs-like structures. would growing on a loaf of bread left in a cupboard. The mo
   i) Which kind of microorganism is responsible for the mould observed on the bread?
   ii) To which phylum/division does this organism belong?

   b) What are three (3) distinctive features of the Kingdom to which mushrooms belong?

   c) Suggest the Kingdom in which the observed organism (a) (i) above and give three benefits.
8. There is a very big debate to why biology should not be taken as an optional subject like other optional subjects at ordinary secondary school. You as an expert in biology state reasons to why biology should be studied by all o – level students. (6 points)

SECTION C: 30 Marks

Answer only two questions from this section

9. Because evolution occurs a very long period of time in higher animals and plants, many people are not easily convinced that evolution does actually take place. Explain four evidences of the origin of evolution that can make people find the theory of evolution credible.
10. Describe how the following method of family planning works
    a) Implants
    b) Rhythm (calendar) method
    c) Withdraw
    d) Condom
11. The body of the human being is made up of frame work of interconnected bones which play crucial roes to the body. Justify the statement (4 points)

FORM FOUR JOINT EXAMINATION - 2025

BIOLOGY 1

MARKING SCHEME.

01.

i	ii	iii	iv	v	vi	vii	viii	ix	x
B	E	C	E	B	E	C	D	A	D

1 Mark @

2.

i	ii	iii	iv	v	vi
H	F	D	B	G	C

1Mark @

3 a) i) Oestrogen hormone
ii) Adrenaline hormone
iii) Glucagon
iv) Oxytocin

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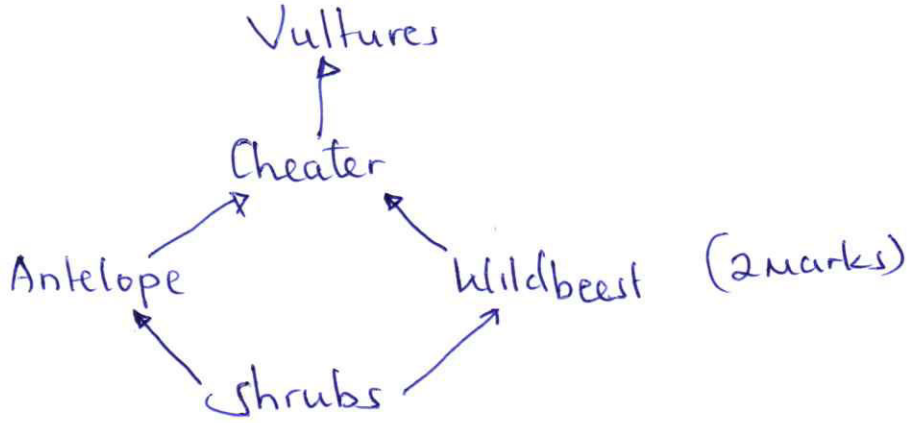
1Marks @

b)

HORMONAL COORDINATION	NERVOURS COORDINATION
- Is slow and the response takes much longer	Is quick and the response is immediate
- Does not require specialised cells	- It involves specialised cells.
- Needs blood stream to transport hormones to different parts of the body.	- Uses nerves cells for conducting nerve impulses
- Transmission of information is of a chemical nature.	- Transmission of information is of electrical nature.
- It involve endocrine glands	- Involve receptors and brain
- Control slow or long term activities such as growth	- Control activities which require fast response

any 5 points = 5 Mark 1@.

4 a) i) FOOD WEB.



(2 Marks)

ii) FOOD CHAINS

Shrubs → Antelope → Cheater → Vulture.
Shrubs → Wildbeest → Cheater → Vulture

(1 mark @).

b) Advantages of breast feeding.

- Protect the body from infections (first breast feeding produces colostrum)
- It is safe and will not introduce infections unless the mother is sick
- Provide a balanced diet for the body
- Have right temperature and does not need preparation
- It create a special bond between mother and baby.
- It protect the body from developing obesity
- It protect a baby from developing allergies.

(1 Marks @)

5 a) i) Shivering
- Increase metabolic rate
- Vasoconstriction

1@

ii) Sweating
- Decrease metabolic rate
- Vasodilation.

1@

b) Advantages of Homoiothermic.

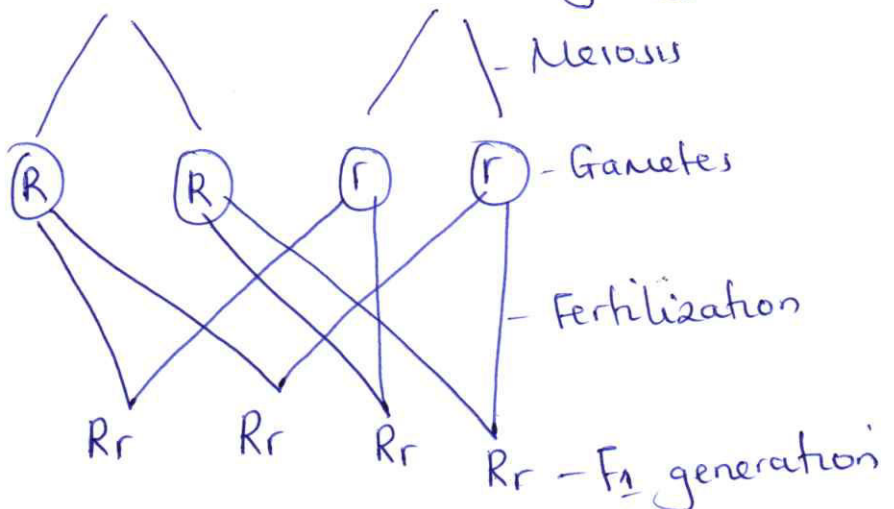
- They have high metabolic rate hence remain active through out their life
- They respond faster to stimuli than poikilotherms
- They are independent from external environmental temperature.

(1@)

6. a)

Let R - represent gene for round seeds
r - represent gene for wrinkled seeds (01 mark)

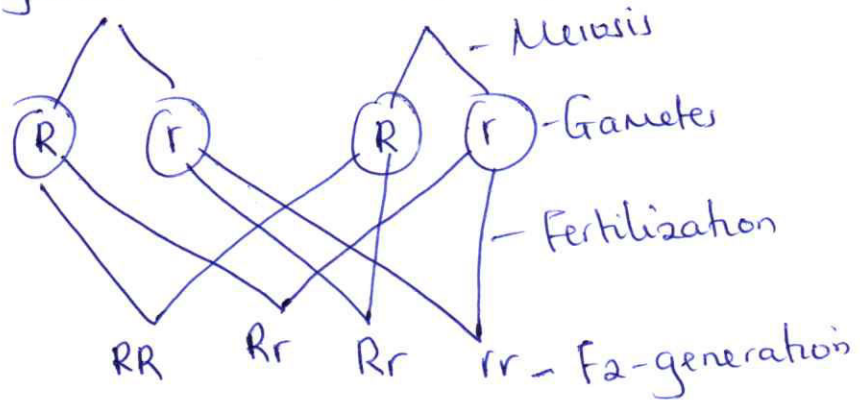
Round × Wrinkled P. Phenotype:
RR × rr - P. genotype



(02 marks)

F1 - phenotype : All are round seeds (0½)
Genotype : Rr (0½ mark)

Cross F1 to get F2.
P. phenotype : Round seeds × Round seeds
P. Genotype; Rr × Rr



(2 marks)

F2 - phenotype : 3 - round seeds (0½ mark)
1 - Wrinkled seeds
Genotype ; RR, Rr, Rr, rr. (0½ mark)

b) Phenotypic ratio : 3 : 1
Genotypic ratio : 1 : 2 : 1 (2 mark 1@)

7 a) i) Bread mould.—(1 mark)

ii) Phylum Zygomycota (1 marks)

b) Features of Kingdom Fungi (Distinctive features)

- They have cell wall made up of chitin
- Their body is made up of a mycelium
- They feed saprophytically

(3 mark)

c) Kingdom Fungi

Benefit of Kingdom Fungi

- Source of food
- Used in food manufacturing industries such as in bakeries
- Yeast is also used to brewing beer by fermenting sugar.
- Used to make lactic acid
- Production of drugs/medicine
- Used in genetic engineering and biological research.

(any three points : 3 marks 1@)

8 Biology should not be taken as an optional subject at O'level because

- It help us to understand ourselves better
- It help us to understand and take care of our environment
- Help us to understand and take care organisms
- Help us to understand causes, symptoms, ~~and~~ mode of transmission and treatment of diseases
- It help us to get professional skills in medicine, nursing and pharmacy.
- It help us to improve varieties of plants and animals.

(1½ mark @ total 9 marks)

SECTION C

9. Introduction (2 marks)

Evidance of the origin of evolution

- Evidence from fossil records
- Evidence from comparative embryology
- Evidence from comparative anatomy.
- Evidence from comparative physiology

- Evidence from cell biology
- Evidence from biogeography
- Genetic variation

Any 4 points @ 3marks = 12).

Conclusion (1marks)

10 Introduction (definition of family planning) (02 marks)

Pt Family planning methods.

Implants: prevent ovulation

Calender methods: to avoid fertile period (3mark @ = 12)

Withdraw: prevent sperm releasing

Conclom: Prevent sperm releasing by collecting

Conclusion (01 mark)

11. Introduction (human skeleton) (2marks)

Function of human skeleton

- It protect internal organs from mechanical damage eg brain by the skull
- It help in production of red blood cell
- They are used for storage of mineral eg calcium
- It help to give the body its shape and support
- It provide the surface area for attachment of muscles.

(@ 3mark = 12)

Conclusion (1marks)