MARKING GUIDE
BIOLOGY F IV

1.

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

(10)

2

LIST A	i	ii	iii	iv	v	vi
LIST B	G	A	D	E	C	I

(06)

SECTION B (54 marks)

3 Biology should not be ~~to~~ taken as an optional subject at O'level because

(i) It helps us to understand ourselves better
(ii) It help us to understand and take care of our environment.
(iii) It help us to understand and take care of other organisms
(iv) It help us to understand symptoms, causes, mode of transmission and treatment of diseases
(v) It help us to get proffessional skills in medicine, nursing and pharmacy. (09)
(vi) It help us to improve varieties of plants and animals. 1½ (a)

4. (a) (i) Camels have the longest loop of Henle which enables it to conserve salt ions, this in turn increase the rate of water reabsorption in the kidney tubule hence making it to live and stay longer without drinking water. (02½)

(ii) It is healthier to breath through your nose instead of your mouth because in the nose there are hairs/cilia that filter out dust particles. In the mouth there are no cilia, hence most of the particles can enter the body along with air hence can (02½)

4 effect of lungs

(a) Components
- Amino acids
- Water
- Urea (02) (1/2)
- Uric acid

5 (a) There are three types of neurons:

(i) Afferent neurons.
→ Only transmit sensory information from the tissues to neural nuclei and ganglia (where they make connections with interneurons or effector neurons) (02)

(ii) Efferent neurons
→ Transmitt commands to tasks performed in several parts of the body (02)

(iii) Interneurons
→ Also known as association or relay neurons, (02) serve as connection between two other neurons

(b) Afference is the conduction of sensory impulses and efference is the conduction of effector impulses (03)

6 (a) When a plant cell is placed in hypertonic solution in absorbs water by osmosis, entering water Creates turgor pressure and the cell wall Creates wall pressure which when they (03) reach at equilibrium the cell becomes turgid and does not burst

(b) The effect in the recipients blood when he has been transfused incompatible blood from the donor (03)
→ The recipients blood undergo agglutination

UBH COOPERATION

6 (b) Which lead to death.

(c) - Blood transfusion should be done only when necessary
- Blood from the donor should be well screened for compatibility
- Donor's blood should be free from any infections
- Transfused blood should be kept in a special bag and stored in refrigerator for not more than 21 days
- Blood transfusion should be done by a qualified person. (03) any three

7 (a) " A pair of trait segregate independtly of another pair during gamete formation " (01)

(b) let R for red seed coat
r for white seed coat

Parent phenotype Red seed coat × White seed coat

Parent Genotype RR rr

Meiosis

Gamete R R r r (02)

Fertilization

F1 generation Rr Rr Rr Rr

(c) F1 phenotype: All heterozygous red

F2 Generation is obtained by selfing F_1 generation

Parent phenotype Red seed Red seed

Parent genotype Rr Rr

Meiosis R r R r (02)

fertilization

F2 generation Rr Rr RR rr

UBM COOPERATION

7 (b) (i) Genotype of F1 generation = All are red
Genotypic ratio of F2 generation = 1:2:1 (01)
(ii) Total number of seeds (No of seeds)
3/4 × 7324 seeds = 5493 seeds (01)
(iii) Percentage of white seeds
1/4 × 7324 seeds = 1831 white seeds
$\frac{\text{number of white seeds}}{\text{Total number of seeds}} \times 100\% = \text{Percentage of white seeds}$
$\frac{1831}{7324} \times 100\% = 25\%$ (01)

Percentage of red seeds
$\frac{\text{Number of red seeds}}{\text{Total number of seeds}} \times 100\%$
$= \frac{5493}{7324} \times 100\%$
$= 75\%$ (01)

8 (a) Importance of photosynthesis
(i) Production of oxygen
(ii) Production of carbon dioxide from the atmosphere
(iii) Production of food to living things (04)
(iv) Conversion of solar energy to chemical energy
(v) Production of fuel.

(b) (i) It is very long about six metres for maximum absorption.
(ii) Have finger like projections (villi) to maximize absorption of food (05)
(iii) It is supplied with many blood capilaries for transportation of absorbed food

8 (b) (iv) Very thin to allow diffusion of digested food

(v) Folded and coiled to increase time for the passage of food for maximum absorption of food.

SECTION B (30 Marks)

9 (a) (i) Cartilage (01)

→ Main type of connective tissue found throughout the body

Functions:

→ Cover the tip of bones and protect the bones from friction. (1½)

→ Make the skeleton of all vertebrates embryos.

(ii) Bones. (01)

→ Are rigid tissues consisting of cells tightly embeded in the hard intercellular material.

Functions:

→ Make the complex network of blood vessels in bone marrow. (1½)

→ Provide a framework for the body support

(iii) Ligaments (01)

→ A band of tough fibrous connective tissue

Function — They support internal organs. (1½)

— Hold one bone to another at joints.

(iv) Tendons. (01)

→ Are tough connective tissues (1½)

→ Connect muscle to bones.

(b) Functions of human skeleton.

① Support (0½)

→ It provide a strong framework that maintain the shape of the body (0½)

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→ Provide attachment for ... any organs (½)
→ Raises the body above the ground for effici ient movement. (½)

(ii) Protection. (½)
→ Protects the delicate organs of the body against mechanical damage (½)
(iii) → eg Protects the spinal cord (½)

(iii) Locomotion. (½)
→ The skeleton provides attachment for the muscle of the body (½)
→ They operate as levers to enhance locomotion (½)

10 (a) Distinctive features of division filicinophyta
→ Leaves have spore producing structures called sori.
→ Leaves are arranged in a clump called fronds (3)
→ Have simple vascular tissue.

(b) General features
→ Live in moist, damp and shady areas
→ Are less dependent on water for survival and reproduction (6)
→ Have true roots, stems and leaves
→ Have vascular tissues
→ Reproduce by means of spores
→ Do not produce flowers and seeds.

(c) (i) They constitute ground cover in moist area.
(ii) Are primary producers
(iii) Are used for decoration in homes and offices
(iv) Are a major component of coal, a fossil fuel
(v) Are used as biological organic fertilizers (6)
(vi) Produce oxygen by photosynthesis, which is needed by animals for respiration

UBN COOPERATION

11 @(i) Anaerobic respiration. The type of respiration that occur in absence of oxygen. (02)

(ii) In animals: Anaerobic respiration results to formation of lactic acid (02)

In plants: Anaerobic respiration cause formation of alcohol. (02)

(b) Economic importance of anaerobic respiration

- → Production of ethanol (alcohol) due to fermentation
- → Production of biogas
- → Production of butter milk, yogurt and cheese
- → Production of lactic acid for food preservation
- → Digestion of organic matter in ruminant
- → Cultivation and waste treatment
- → Generating electricity in microbial fuel cells.

OR 1½ @