

**BONDO SUB-COUNTY JOINT EVALUATION EXAMINATION.**  
**231/1 BIOLOGY PAPER 1(THEORY)**  
**JULY 2024.**  
**MARKING SCHEME.**

1. Biotic factors;  
Abiotic factors;
2. a) Nitrogen; Acc. Phosphorus and Sulphur  
b) Formation of tissues/Component of plasma membrane;  
Formation of enzymes and hormones;  
Source of energy during starvation; **MARK 1<sup>ST</sup> TWO.**
3. Used to identify (and name) unknown living organisms;
4. Cell sap of potato cells is hypotonic/Salt solution is hypertonic; the cells loss water by Osmosis to the sugar solution; Cell membrane detaches from cell wall/cells become flaccid;
5. i) (Selective) reabsorption of glucose and amino acids;  
ii) Reabsorption of salt and water;
6. a)

<b>Structure</b>	<b>Wind pollinated</b>	<b>Insect pollinated</b>
Anther	Large/loosely attached to the filament	Small/firmly attached to the filament;
Pollen grains	Small/smooth/light	Large/rough/sticky/heavier;
Stigma	Feathery/hang outside the flower	Sticky/ located inside flower;

**MARK AS A WHOLE**

- b) Leads to variation;
7. i) Has a moist inner lining to dissolve respiratory gases;  
ii) Thin epithelium for rapid diffusion of respiratory gases;  
iii) Highly vascularised to transport respiratory gases; **Rej. Numerous**
8. a) Transpiration/guttation;  
b) Deposited/stored in fruits/leaves;
9. a) Pisces; **Rej. If starts with small letter p.**  
b) - Have fins for locomotion in water;  
- Body covered with scales;  
- Streamlined body shape;  
- Has operculum which implies presence of gills for gaseous exchange;  
**MARK 1<sup>ST</sup> TWO.**
10. a) Tuberculosis;  
Polio/Poliomyelitis;  
b) - Prevent excessive loss of blood/loss of nutrients in blood;  
- Prevent entry of pathogens;
11. Trap light for photosynthesis and manufacture food used by consumers;
12. - Store air for buoyancy;  
- For gaseous exchange;
13. i) External intercostal muscles relax while internal intercostal muscles contract;  
ii) Diaphragm muscles contract and it flattens;

14.

Mitosis	Meiosis
Daughter cells are diploid	Daughter cells are haploid;
Two daughter cells formed	Four daughter cells formed;
Takes place in somatic cells	Takes place in sex cells;
No chiasma formation	Chiasma formation occurs;
Takes place in one nuclear/cell division	Takes place in two nuclear/cell divisions;
Leads to growth and repair	Leads to gamete formation;

MARK AS A WHOLE; 1<sup>ST</sup> THREE.

15. - Gaseous exchange;

- Translocation;

- Absorption of mineral ions; MARK 1<sup>ST</sup> TWO.

16. Mark the boundaries of the study area/Football field. Capture as many grass hoppers as possible within the study area using a sweep net and mark all of them with a quick drying paint; record the number of the marked grass hoppers as First Captured(FC) before releasing them back to the environment; Return to the study area after 24 hours/One day and capture another sample of grasshoppers. Record the total number as Second Captured (SC); Identify those bearing marks and record their number as Marked Recaptured (MR);

Estimate the population using the formula:  $P = \frac{FC \times SC}{MR}$ ;

Ttl...5mks

Max...4mks

17. a) Adenosine Triphosphate; Acc. ATP

b) Glucose  $\longrightarrow$  Ethanol + Carbon (IV) Oxide + Energy;

c) - They requires more oxygen to oxidized;

- They are insoluble in water hence difficult to transport to the sites of respiration;

18. i) Positively phototropism;

ii) Unidirectional light causes lateral migration/diffusion of auxins to the dark side; higher concentration of auxins on the dark side stimulates rapid growth causing a curvature towards light;

19. a) Parental phenotype Spotted(Male) Plain feathers(Female)

Parental genotype Bb X bb ;

Gametes B b b b ;

Fusion ;

F1 generation      Bb      Bb      bb      bb      ;

- b) i) - Down's syndrome;  
 - Klinefelter's syndrome;  
 - Turner's syndrome;

MARK 1<sup>ST</sup> ONE

- (ii) - Albinism;  
 - Sickle Cell Anaemia;  
 - Haemophilia;  
 - Colour blindness;  
 - Chondrodystrophic dwarfism/Achondroplasia;

20.

MARK 1<sup>ST</sup> ONE

Blood entering the liver	Blood leaving the liver
i) More nutrients/glucose/amino acids	Less nutrients/glucose/amino acids;
ii) Less Carbon (IV) Oxide concentration	More Carbon (IV) Oxide concentration;
ii) More Oxygen	less Oxygen;

MARK AS A WHOLE; 1<sup>ST</sup> TWO

21. a) Name: Olecranon process;

Significance: -Has a sigmoid notch for articulation with humerus bone;

- Prevents overstretching of the elbow joint;

MARK ANY ONE FUNCTION

- b) Tricep muscles contract; bicep muscles relax;

22. a) - Oxygen concentration;

- Glucose concentration;

- pH;

- Presence of Enzyme inhibitor; MARK 1<sup>ST</sup> TWO.

- b) *Temperature* - The rate of active transport increases with increase in temperature up to the optimum temperature; further increase in temperature slows down the rate of active transport until it stops because enzymes get denatured;

23. a) Remains of ancestral forms of living organisms that were accidentally preserved in naturally occurring material; (e.g. sedimentary rock)

- b) Divergent evolution;

- c) Case of Peppered moth in Britain; resistance to malaria by sickle cell trait individuals; resistance to insecticides by insects; resistance to antibiotics by bacteria; resistance to herbicides by some weeds; resistance to acaricides by ticks; resistance to anti-malarial drugs by *Plasmodium* spp.; MARK 1<sup>ST</sup> TWO

24. i) - Its cells contain melanin that protects the skin against ultra-violet light from the sun;

- Have actively dividing cells that form new epidermis;

MARK ANY ONE

- ii) - Produce sweat through which body excretes water/salts/traces of urea;

- Produce sweat that evaporates from the body (using latent heat of vaporization) thus cooling the body in hot conditions;

MARK ANY ONE

25. a) Vascular cambium; Acc. Cambium alone & Cork cambium.  
b) Egg, Nymph, Adult/Egg → Nymph → Adult;
26. a) Ciliary muscles contract and the suspensory ligaments relax; the lens bulges/become thicker/lens curvature increases; (causing light from the close object/diagram to be greatly refracted onto the retina/fovea centralis)  
b) Cerebellum;
27. a) Pancreas secrete more insulin; which stimulates liver cells to convert excess glucose into glycogen for storage; some glucose is converted into fats and stored beneath the skin; and increased oxidation of glucose to release energy; Ttl 4mks, Max 3mks.  
b) Glucagon;
28. - Expose leaves to light for photosynthesis;  
- Expose flowers to agents of pollination;  
- Expose fruits and seeds to agents of dispersal;  
- Support the weight of the shoot;  
- Reduce/resist breakage due to forces in the environment such as wind;

MARK 1<sup>ST</sup> TWO

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