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## FORM 4 ENTRANCE EXAMS 2024

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NAME \_\_\_\_\_ ADM NO \_\_\_\_\_

DATE \_\_\_\_\_ SIGNATURE \_\_\_\_\_

INDEX NUMBER: \_\_\_\_\_

**BIOLOGY**  
**231/1**  
**Paper 1**  
**TIME: 2HRS**

**Kenya Certificate of Secondary Education**

**231/1**  
**BIOLOGY**  
**PAPER 1**  
**TIME: 2HRS**

**INSTRUCTIONS:**

- (a) Write your **name, class, admission number** and **index number** on the space provided.
- (b) Answer all the questions in the spaces provided
- (c) Candidates should check to ensure that all the pages are printed as indicated and that no questions are missing.
- (d) This paper consists of **10 pages**.

1. Name the part of a flower that develops into:

[i] Seed

[1 mark]

.....

[ii] Fruit

[1 mark]

.....

2. State **two** ways in which floating leaves of aquatic plants are adapted to gaseous exchange.

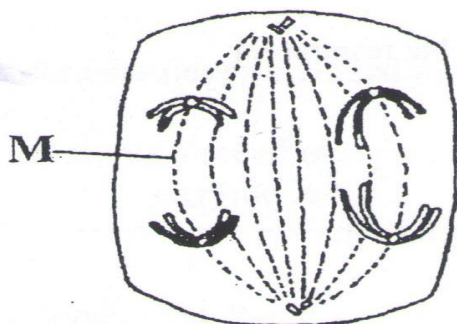
[2 marks]

.....

.....

.....

3. The diagram below represents a stage during cell division



[a] [i] Identify the stage of cell division

[1 mark]

.....  
[ii] Give **two** reasons for your answer in [a] [i] above

[2 marks]  
.....  
.....  
.....

[b] Name the structure labeled M

[1 mark]  
.....

4. [a] Distinguish between the terms

[2 marks]

Homodont and heterodont

.....  
.....  
.....  
.....

[b] What is the function of the carnassial teeth

[2 marks]

.....  
.....  
.....

5. A patient with blood group A was involved in a road accident and required urgent blood transfusion. His relatives were invited to donate blood.

[a] Name the compatible blood groups

[2 marks]

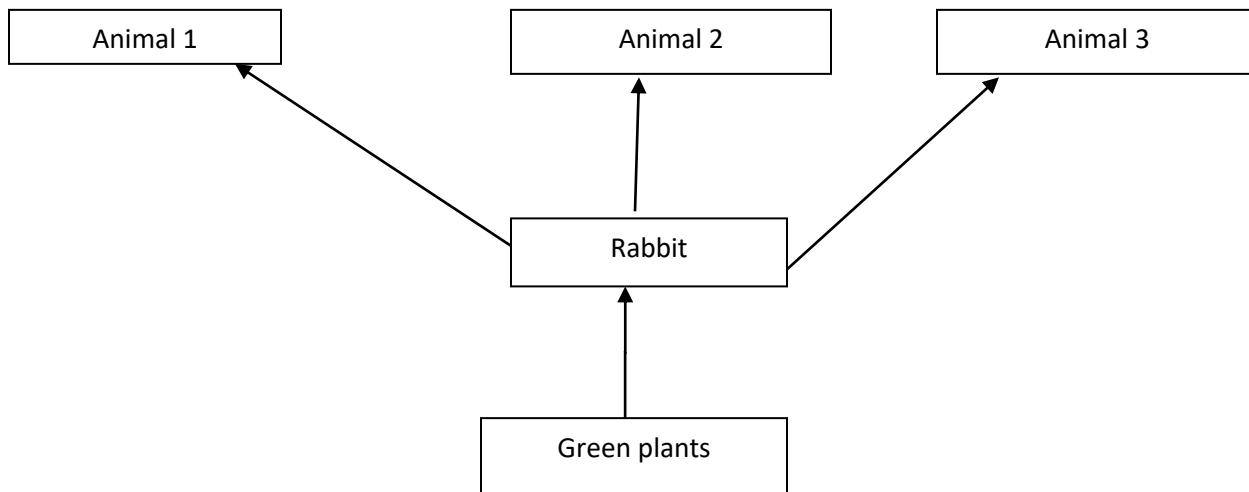
.....  
.....  
.....

[b] State why other blood groups were not compatible

[2 marks]

.....  
.....  
.....

6. The flow chart shows a part of a food relationship in an ecosystem



[a] [i] Name the food relationship shown [1 mark]

.....  
.....

[ii] How many trophic levels are shown in the diagram [1 mark]

.....  
.....

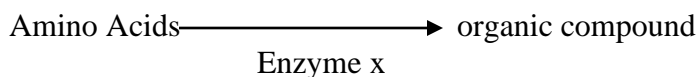
[b] What is the main source of energy in the ecosystem [1 mark]

.....  
.....

7. Name the only epidermal cell in plants that contain chloroplast [1 mark]

.....  
.....

8. The equation below represents a metabolic process that occurs in the mammalian lives



[a] Name the process that represents the above equation [1 mark]

.....  
.....

[b] Identify the enzyme represented by x [1 mark]

.....

.....  
[c] What is the importance of the process to the mammal [1 mark]  
.....  
.....

9. [a] Name the carbohydrate that is stored in mammalian muscle [1 mark]  
.....  
.....

[b] What name is used to describe removal of indigestible and undigested food material from the alimentary canal [1 mark]  
.....  
.....  
.....

10. [a] Carl Linnaeus developed the taxonomic units of classification

[i] What is taxonomy [1mark]  
.....  
.....

[ii] Why was the system of classification by Carl Linnaeus described as natural system of classification [2 marks]  
.....  
.....  
.....

11. Phagocytes also called granulocytes or polymorphs are cells found in the blood that ingest pathogens and cell debris

[i] Why are they called polymorphs. [1 mark]  
.....  
.....

[ii] Name the cell organelle most abundant in phagocytes that enable them function effectively. [1 mark]  
.....  
.....

12. Name the:

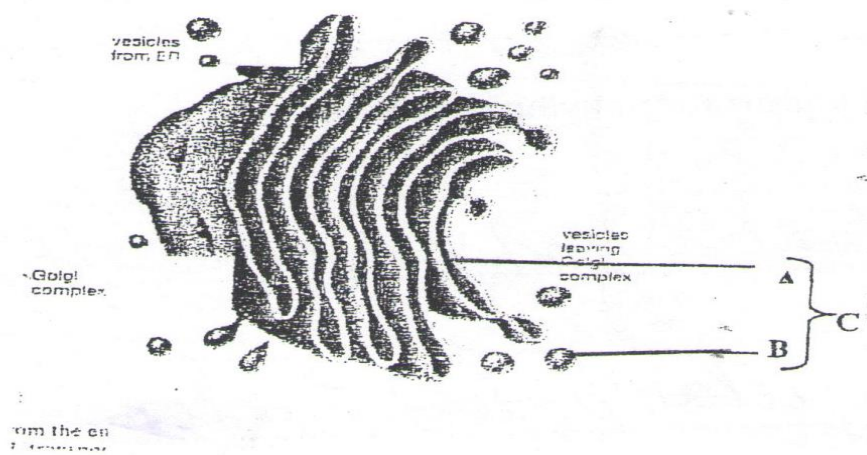
[a] Material that strengthens xylem tissue [1 mark]

.....  
.....

[b] Tissue that is removed when the part of a plant is ringed [1 mark]

.....  
.....

13. The diagram below represents a cell organelle.



[i] State the function of this organelle [1 mark]

.....  
.....

[ii] Name each of the parts A and B

A ..... [1 mark]

B ..... [1 mark]

14. In which two ways do guard cells differ from other epidermal cells [2 marks]

.....  
.....  
.....

15. [a] Through cellular respiration, the chemical energy stored in glucose molecule is converted into which specific molecule [3 marks]

.....  
.....  
.....

[b] Name the substance that speed up biochemical reaction [1 mark]

.....

.....

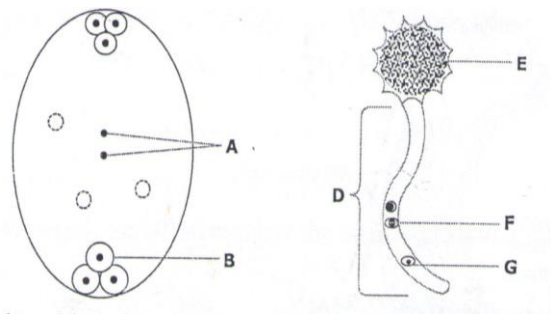
16. During germination and early growth, the dry weight of endosperm decreases while that of embryo increase explain. [2 marks]

.....

.....

.....

17. The diagrams below show changes in the life cycle of flowering plants.



[i] Complete the table below by choosing the letters from the diagram which refers to each of the stages given. [4 marks]

STAGE OF LIFE CYCLE	LETTER
Male gametophyte	
Tube nucleus	
Female gamete	
Male gamete	

18. State **two** characteristics of kingdom Monera that are not found in other kingdoms. [2 marks]

.....

.....

.....

19.State **three** ways by which plants compensate for lack of the ability to move from one place to another. [3 marks]

.....

.....

.....

.....  
.....

20. State **three** physiological processes that are involved in movements of substances across the cell membrane. [3 marks]

.....  
.....  
.....  
.....

21. If the human pancrease is not functional:

[a] Name the hormone which will be deficient. [1 mark]

.....  
.....

[b] Name the disease the human is likely to suffer from. [1 mark]

.....  
.....

22. The oxidation state of a certain food is represented below by a chemical equation.



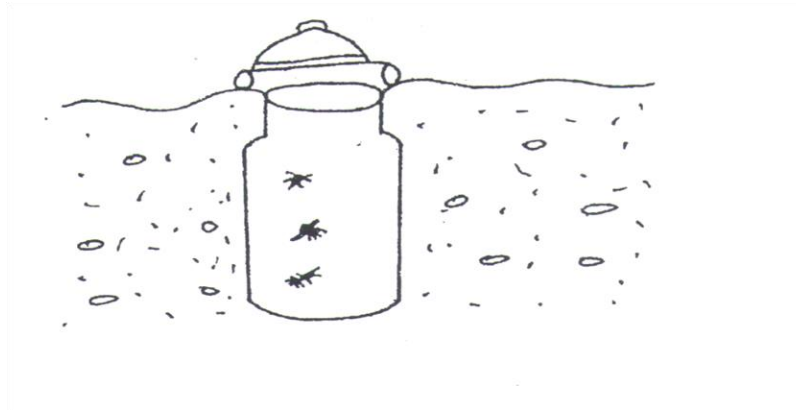
[a] Calculate the respiratory quotients [RQ] of the food substance. [2 marks]

[b] Identify the food substrate [1 mark]

.....  
.....



23. The diagram below shows an apparatus used during collection of specimen.



[a] Identify the apparatus [1 mark]

.....  
.....

[b] What is the use of the apparatus named above [1 mark]

.....  
.....

24. State **two** physical factors in an ecosystem that affect the distribution of organisms. [2 marks]

.....  
.....  
.....  
.....

25. A DNA strand has the following base sequence G C C T A G A T C A C.

What is the sequence of the

[i] Complementary DNA strand [1 mark]

.....  
.....

[ii] M-RNA strand copied from this DNA strand. [1 mark]

.....  
.....

26. State **three** limitations of fossil records as evidence of organic evolution [3 marks]

.....  
.....  
.....

.....

.....

27. Explain the term “Resistance” as used in evolution of living organisms [2 marks]

.....

.....

.....

.....

28.State the function of the following parts of a light microscope .

[ i] Body tube [1 mark]

.....

.....

[ii] Diaphragm [1 mark]

.....

.....

29. The table below shows analogies of gene mutations. [3 marks]

	Intended message	Actual message
A	Buy me a skirt	Buy me a shirt
B	This is my team	This is my mate
C	Auntie is staying	Auntie is straying

Identify the type of gene mutation illustrated

A .....

B.....

C .....

30. State **two** sources of variations. [2 marks]

.....

.....

.....

31. Name the diseases caused by each of the following [2 marks]

(a) *Plasmodium falciparum*

.....

.....  
.....  
(b) *Entamoeba histolytica*  
.....  
.....  
.....

*FORM 4 ENTRANCE EXAMS 2024*

**BIOLOGY 231/1 MARKING SCHEME**

1.[a]Ovule

[b]Ovary

2. Aerenchyma tissue with large air spaces to store air.

Large stomata found on the upper surface of the leaf

3.[a] (i)Anaphase1

(ii) -Homologous chromosomes separate towards the poles

b -Spindle fibres contract separating the homologous chromosomes

b) Spindle fibre

4.[a] –Homodont –teeth of the same size and shape

– Heterodont –teeth of different size and shape

[b]Special pre-molars with smooth sides and sharp edges to slice through flesh and crush bones

5 [a] -B

-AB'

[b] O –Universal donor since they have no antigens

A – Same blood group hence no agglutination

6.[a]-[i] Food web

-[ii] Three

[b] Sun

7. Guard cells

8.[a] Deamination

[b] Enzyme aminase

[c] Removal of the excess amino acids

9.[a] Glycogen

[b] Egestion

10.[a]-[i] Science of classification

-[ii] Uses evolutionary relationship between organism and their ancestor

11.[a]-[i] They have lobed nuclei

-[ii] Lysosomes

12.[a] Lignin

[b] Phloem

13. [i] –Packing and transport in vesicles of material such as enzyme

– Secretion of synthesized proteins, carbohydrates

– Process of cisternae

– Involved in lysosome formation

[ii] A. Golgi Apparatus

B. Golgi vesicles/ bodies

14 – Guard cells have chloroplast hence photosynthesis, epidermal cells are transparent

–Have thicker inner walls and thin outer walls for differential expansion to facilitate opening and closing of the stomata.

–Are bean shaped

-Epidermal cells have uniformly thickened walls

-Epidermal cells are rectangular flattened cells

15.[a] ATP-Adenosine triphosphate

CO<sub>2</sub>-Carbon [IV] oxide

H<sub>2</sub>O-Water

[b] Enzymes

16. Food stored in the endosperm was oxidized to form energy for the process and also form new material for growth in the embryo.

17. Embryo grows and develops forming new issues that result in increase in weight

STAGE OF LIFE CYCLE	LETTER
Male gametophyte	D
Tube nucleus	G
Female gamete	B
Male gamete	F

18. -Their nuclear material is not enclosed within a nuclear membrane so the genetic material is not separated from the rest of the cell/Prokaryotic

- They do not have membrane bound organelles

19.-Plants are able to synthesize their own food.

-Plants are able to use pollination rather than moving to seek mating partners.

-Plants use seed and fruits dispersed to colonize new habitats.

20.-Diffusion

-Osmosis

-Active transport

21.[a]Insulin, glucagon

[b]Diabetes mellitus, Hypoglycaemia

22.[a]  $RQ = \frac{\text{volume of carbon[IV] oxide produced}}{\text{Volume of oxygen consumed}}$

$$5/6 = 0.83$$

[b] Proteins

23.[a]Pitfall trap

[b] For catching crawling animals

24.-Temperature; Humidity

-Light ; Atmospheric pressure

25.[i] CGGATCTAGTG

[ii]CGGTUCUTGUG

26.-Several missing links

-Most organisms especially soft-bodied ones do not form fossils

-Exposed fossils are usually destroyed by physical and chemical weathering

-Most animals are preyed upon.

27.Some individuals in a population possess genes that have undergone mutations resulting in resistance against some chemicals. The mutations establish a population of resistant forms

28. [i]Holds the eyepiece and the revolving nosepiece

[ii]An aperture that regulates the amount of light passing through the condenser to illuminate the specimen.

29.-Substitution

-Inversion

-insertion

30.-Mutation

-Crossing over during prophase of meiosis

-Sexual reproduction [fertilization]

-Independent assortment of chromosomes during metaphase of meiosis 1

31. (a) Malaria

(b) Amoebic dysentery

