**Name……………………………………………………….......index no:………………………………………**

**School ……………………………………………………Candidate’s Signature …………..…..…………….**

 **Date: ……………………………………………**

**231/1**

**BIOLOGY**

**PAPER 1**

**(THEORY)**

**TIME: 2 HOURS**

***Kenya Certificate of Secondary Education (K.C.S.E.)***

***(FORM FOUR)***

**231/1**

**Biology**

**Paper 1**

**Time: 2 hours**

**INSTRUCTIONS TO CANDIDATES**

* *Write your* ***name, Admission******number and name of your*** ***school*** *in the spaces provided above*
* ***Sign*** *and write the* ***date*** *of examination in the spaces provided.*
* *Answer* ***all*** *the questions in the spaces provided.*
* ***This paper consists of 8printed pages.***
* ***Candidates should check to ascertain that all pages are printed as indicated and that no questions are missing***

**For Examiners Use Only**

|  |  |  |
| --- | --- | --- |
| **Question** | **Maximum score** | **Candidate’s score** |
| **1- 29** |  **80** |  |

1 . a) What is metamorphosis? (1mark)

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2. a)The diagram below shows a certain plant.



1. Name the division in the kingdom Plantae to which the plant belongs. (1mark)

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1. State the functions of structure labelled K and L. (2marks)

**K** .............................................................................................................................................................

 **L**...............................................................................................................................................................

3. State three functions of an exoskeleton in members of the phylum Arthropoda. (3marks)

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4. The diagrams below show embryos of certain vertebrates animals. Study them and answer the question that follows.

1. Mention two observable structural features in these embryos that suggest that they have a common ancestral origin. (2marks)

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1. What phenomenon in organic evolution is exhibited by these diagrams of embryos? (1mark)

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 5. What is meant by the terms? (3marks)

 a) Hypogenous flower

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 b) Gamesepalous ………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………

c) Dichagamy …………………………………………………………………………………………………………………………………….………………………………….………………………………………………………………..

 6. a) Name two salts in bile that aid in emulsification of fats. (2marks)

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 b) In what ways does sex of an individual determine their energy requirements? (1mark)

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 7. What is the main difference between the phloem tissues of subdivisions Gymnospermaphyta and

 Angiospermaphyta. (1mark)

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 8. a) State two ways in which the protection of the heart against mechanical injury is achieved during heartbeat. (2marks)

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9. a) State two functions of aerenchyma tissue in hydrophytes. (2marks)

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 b) State the difference between habitat and ecological niche. (2marks)

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10.Name two type of mutation represented below. (2mks)

 (i) Original strand (ii) Mutated strand

 A B C D E F P B C D E F

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 11. Name the enzyme in the red blood cell that speeds up the conversion of carbonic acid to carbon (IV) oxide. (1mark)

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 12. State **three** ways in which the skin of a frog is adapted for gaseous exchange. (3marks)

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 13. What would be the effect of the following treatments on the nerve transmission?

 (i) Inducing the axon with metabolic inhibitors. (1mark)

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 (ii) Removing myelin sheath from a nerve fibre. (1marks)

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14. a) Under which of the following light microscope magnification would one see a larger part of the

 specimen. $×40 or ×400$ (1mark)

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 b) Give your reason (1mark)

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15. Give two reasons why blood leaving the lungs may not be fully oxygenated (2marks)

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16. The diagram below represents a simple endocrine feedback mechanism in human male.

PITUITARY

 GLAND

 HORMONE HORMONE

 X Y

 TESTES

1. Name the hormone labelled **X** ………………………………………………………………..(1marks)
2. State **two** differences that may be observed between a normal male and one who is incapable of producing hormone labelled **Y**. (2marks)

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17. What is the importance of Retina in vision? (2marks)

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18. State four differences between wind pollinated flower and insect pollinated flower. (4marks)

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19. a) Name the cartilage found between the bones of the vertebral column. (1mark)

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 b) State the function of the cartilage named in (a) above. (1mark)

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20. State the functions of the following organelles

 a) Lysosomes (1mark)

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 b)Golgi apparatus (2marks)

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21. The cells shown below were obtained from two different plant cells which were immersed in 2% and 25% salt solutions.

** A B**

1. Which of the two cells **A** and **B** was immersed in 2% salt solution? (1mark)

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1. Name the substance present in part marked **X**. (1mark)

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1. Comment on the nature of 25% salt solution in relation to the cell sap. (1mark)

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1. What biological phenomenon leads to the observation made in **A**. (1mark)

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22. Name two structures found in the cortex of the kidney (2marks)

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23. State the importance of osmoregulation in organisms (2marks)

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24. State the role of the following hormones in human body. (2marks)

 (i) Insulin……………………………………………………………………………………………………

 (ii) Anti diuretic hormone……………………..……………………………………………………………

25. Explain how high humidity lowers the rate of transpiration. (2marks)

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26. The diagram below shows the internal structure of a leaf

**E**

1. Name the part labelled B. ……………………………………………………………………………………………….. (1mark)
2. State the function of the part labelled **C**. ……………………………………………………………………………………………… (1mark)
3. State the difference between xerophytes and hydrophytic leaves. (2marks)

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27. a) Distinguish between breathing and respiration. (2marks)

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 b) Explain the disadvantages of anaerobic respiration in plant rots. (2marks)

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28. a) Suggest the significance of the following adaptations in bony fish.

 (i) Flexible vertebral column (1mark)

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 (ii) Presence of swim bladder (1mark)

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 b) State two features which reduce resistance in fish during swimming. (2marks)

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29. State three protective functions of human eye. (3marks)

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