

Name: ..... Index No.:.....  
School: ..... Candidate's Sign:.....  
Date:.....

231/1  
BIOLOGY  
PAPER 1  
(THEORY)  
JULY/AUGUST - 2015  
TIME: 2 HOURS

**TRANS-NZOIA COUNTY JOINT EVALUATION EXAM – 2015**  
*Kenya Certificate of Secondary Education (K.C.S.E)*

**BIOLOGY**  
**PAPER 1**  
**2 HOURS**

**INSTRUCTIONS TO THE CANDIDATES**

- Write your *name* and *index number* in the spaces provided above.
- *Sign* and write the *date* of examination in the spaces provided.
- Answer *all* questions in the spaces provided in the question paper.
- Additional pages **must not** be inserted.

**For Examiner's Use Only:-**

QUESTION	MAXIMUM SCORE	CANDIDATE'S SCORE
1 - 28	80	

*This paper consists of 8 printed pages.  
Candidates should check the question paper to ascertain that all pages are printed as indicated.  
And that no questions are missing.*

1. (a) Explain the **importance** of gradual release of heat energy in a cell during respiration. (1 mk)

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(b) Name the products of glycolysis. (2 mks)

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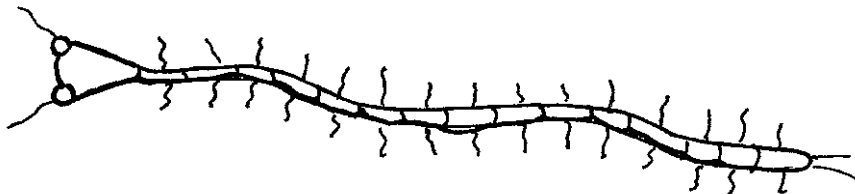
2. (a) Differentiate between **essential** and **non-essential** amino acids. (2 mk)

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(b) Name **two** constituents of food that are absorbed without digestion. (2 mks)

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3. Study the diagram below.

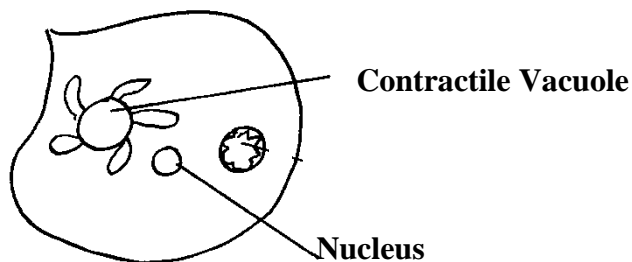


(a) Identify the class to which the organism belongs. (1 mk)

(b) Give a reason for your answer in (a) above. (1 mk)

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4. The diagram below shows a process in amoeba.

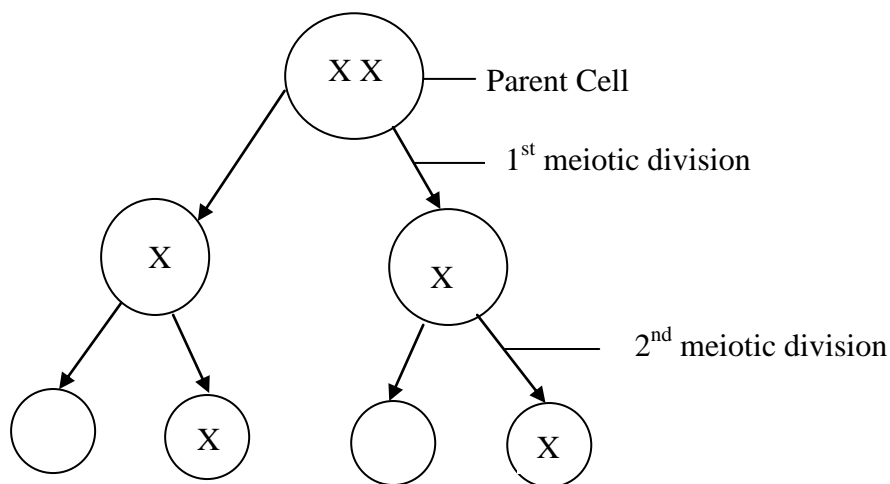


(a) State the habitat of the organism. (1 mk)

(b) Explain how the contractile vacuole functions in the organism drawn above. (2 mks)

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5. The illustration below shows a type of chromosomal mutation. Use it to answer the questions that follow:



- (a) Identify the type of chromosomal mutation illustrated above. (1 mk)

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- (b) Name **one** disorder in humans caused by the above named chromosomal mutation characterized by presence of an extra chromosome on chromosome number 21. (1 mk)

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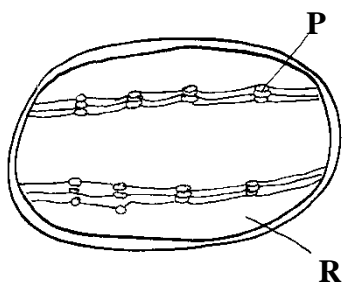
- (c) (i) What is polyploidy? (1 mk)

.....  
 .....

- (ii) State **one** beneficial effect of polyploidy in plants. (1 mk)

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6. The diagram below shows and organelle in a plant cell.



- (a) Identify the organelle. (1 mk)

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- (b) (i) Name the structure labelled P. (1 mk)

.....

- (ii) Write a word equation of the reaction taking place in R. (1 mk)

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7. The flippers of whales and fins of fish adapt these organisms to aquatic habitat.  
(a) Name the evolutionary process that may have given rise to these structures. (1 mk)

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.....

(b) What is the name given to such structures? (1 mk)

.....

(c) In the view of modern genetics, explain why the Lamarckian theory is unacceptable. (1mk)

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8. What characteristics of living organisms is represented by the following:-

(a) A cat producing kittens. (1 mk)

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(b) A girl dropping a hot pan. (1 mk)

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9. (a) Name the strengthening tissue found in woody plants deposited with;

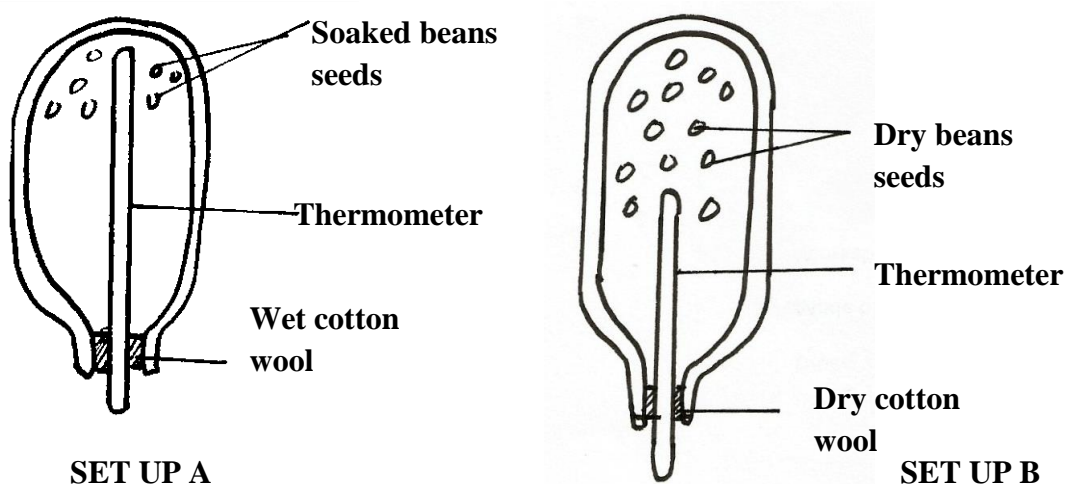
(i) Cellulose and Pectin. (1 mk)

.....  
(ii) Lignin (1mk)

(b) State a reason why xylem vessels are regarded to be more efficient in transport of water and dissolved mineral salts up the plant than the tracheids. (1 mk)

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10. Form 2 students set up an experiment as shown below.



(a) State the **aim** of their experiment. (1 mk)

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.....

(b) State **one** observation made in set up **A** after some times. (1 mk)

.....

(c) Account for the observation made in **B** above. (2 mks)

.....

.....

(d) What is the **role** of set up **B**? (1 mk)

.....

**11.** The diagram below shows a bone of the hind limb. Study it and answer the questions that follow:-

**Q**

**R**

**Z**

(a) Name the bone. (1 mk)

.....

(b) Name the parts labelled **Q** and **R**. (2 mks)

**Q** .....

**R** .....

(c) Name the structure that articulates with the part labelled **Z** and the joint formed. (2 mks)

Structure .....

Joint .....

**12.** (a) What is peristalsis?. (1 mk)

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(b) State **one** component in the animal diet which promotes peristalsis. (1 mk)

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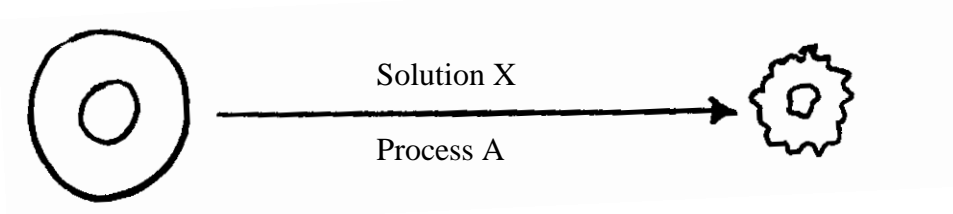
**13.** State a characteristic of Red blood cells which enables them to squeeze through blood capillaries.

(1 mk)

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.....

14. The diagram below illustrates the behavior of a red blood cell when placed in solution X.



(a) Suggest the nature of solution X. (1 mk)

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(a) Name process A. (1 mk)

.....

(b) Account for the appearance of the red blood cell. (3 mks)

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15. The table below shows the percentage composition of carbon (IV) oxide and oxygen in inhaled and exhaled air.

Gases	Inhaled air	Exhaled air
Oxygen	20%	17%
Carbon (iv) oxide	0.04%	4.0%

(a) Explain the differences in percentages of the two gases in inhaled and exhaled air.

(i) Oxygen (2 mks)

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(ii) Carbon (iv) oxide (2 mks)

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16. State the functions of the following parts of the mammalian ear.

(i) Tympanic membrane (1 mk)

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(ii) Eustachian tube (1 mk)

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(iii) Vestibular apparatus (1 mk)

17. What is parthenocarpy? (1 mk)

18. Differentiate between interspecific and intraspecific competition. (2 mks)

19. (a) What is organic evolution? (1 mk)

(b) List **three** limitations of fossil records as an evidence of organic evolution. (3 mks)

20. Name the type of response shown by:-

(a) Leaves of *Mimosa pudica* when they fold after being touched. (1 mk)

(b) Euglena when it swims towards light. (1 mk)

21. Name the micro-organism found in the root nodules of leguminous plants. (1 mk)

22. In a certain bird species black colour of feather is dominant over white colour. A heterozygous black bird was crossed with a homozygous white bird.

(a) State the genotype of the two parents.

(Use letter **B** to represent gene for black colour and **b** for white colour). (2 mks)

(b) Using the genetic crosses work out the F<sub>1</sub> generation. (4 mks)

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23. (a) Name the hard body covering found in organisms in phylum Arthropoda. (1 mk)

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(b) State **three** uses of the structure named in (a) above. (3 mks)

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24. State **two** organelles absent in members of kingdom Monera but present in members of kingdom Protoctista. (2 mks)

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25. Name the substance produced during anaerobic respiration in animals and state why it should be got rid of immediately. (2 mks)

Substance .....

Reason .....

26. What is the significance of chiasma formation during meiotic cell division. (1 mk)

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27. Distinguish between **continuous** and **discontinuous** variation. (2 mks)

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28. State how the palisade cell is specialized to carry out its function. (1 mk)

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