Eldoret East Inter-Schools Test - 2013
Kenya Certificate of Secondary Education (K.C.S.E.)
Form Four.

Candidate Instructions.
- Answer all the questions in the spaces provided after each question.
- Answers must be written in the spaces provided in the question paper.

For Examiners Use Only

<table>
<thead>
<tr>
<th>Question</th>
<th>Maximum Score</th>
<th>Candidates Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-29</td>
<td>80</td>
<td></td>
</tr>
</tbody>
</table>

Candidates Total

This paper consists of 8 printed pages.
Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no question is missing.
1. State **two** main branches of biology. (2 marks)

_______________________________________________________________________________

_______________________________________________________________________________

2. Name the cell organelle which perform the following function:-
   i) Formation of spindle fibres during cell division (1 mark)
   ________________________________________________________________
   ii) Other than the function given in (i) above, state other function of the organelle. (1 mark)
   ________________________________________________________________

3 a) An electron microscope has a much greater resolving power than a light microscope. Explain the meaning of the term resolving power. (1 mark)
   ________________________________________________________________
   ________________________________________________________________

b) Give a reason why an electron microscope cannot be used to study life specimen. (1 mark)
   ________________________________________________________________

4 The following is the dental formula of a mammal.
   \[ i^{2/1} c^{0/0} pm^{3/2} m^{3/3} \]
   a) State the mode of nutrition of the animal. (1 mark)
   ________________________________________________________________

b) Calculate the number of teeth in the animal. (1 mark)
   ________________________________________________________________

5 The diagram below illustrates a process in a given species of organism

   ![Diagram of cell division](Parent cell --> Child cell)

   a) Name the organism (1 mark)
   ________________________________________________________________

   b) Suggest the kingdom to which the organism belong giving one reason (2 marks)
   ________________________________________________________________
   ________________________________________________________________
   Reason ____________________________________________________________
   ________________________________________________________________
6. a) Explain **two** characteristics of arthropoda that make them most successful of invertebrates. (2 marks)

b) State any **two** economic importance of fungi. (2 marks)

7. State the importance of the following features in gaseous exchange.
   a) Presence of cartilage in trachea. (1 mark)
   b) Large surface area of the lungs. (1 mark)

8. State **two** roles played by active transport in animals. (2 marks)

9. Distinguish between test cross and back cross as used in genetics. (2 marks)

   **Test cross**                          **Back cross**

10. Explain how the rate of transpiration is affected by the following factors.
    a) Size of leaf (1 mark)
    b) The relative humidity (1 mark)

11. An experiment set-up shown below were to investigate a certain process:

    ![Experimental setup diagram](image)
After 20 minutes; a student tested the sample from the beaker for starch and glucose. The results were recorded in the table below.

<table>
<thead>
<tr>
<th>Time</th>
<th>Start</th>
<th>after 20 minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Starch</td>
<td>Absent</td>
<td>Absent</td>
</tr>
<tr>
<td>Glucose</td>
<td>Absent</td>
<td>Present</td>
</tr>
</tbody>
</table>

a) Explain the presence of glucose in the water sample. (1 mark)

b) What change occurred in volume of liquid in:-
   i) Beaker
      (1 mark)
   ii) Visking tubing
      (1 mark)

12. Write the sequence of messenger RNA (M-RNA) that would be coded from the DNA strand shown below. (1 mark)
   _____C_____A______T_____G______A_______A_____G_____T
   Sequence of RNA.

13. Give the role of the following parts of the male reproductive system. (3 marks)
   a) Epididymis
      ______________________________________________________
      ______________________________________________________
   b) Prostrate gland
      ______________________________________________________
      ______________________________________________________
   c) Urethra
      ______________________________________________________
      ______________________________________________________
14. Fill the blanks in the table below.

<table>
<thead>
<tr>
<th>ORGAN</th>
<th>HORMONE</th>
<th>FUNCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>PITUITARY</td>
<td></td>
<td>i) Causes ovulation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ii) Stimulate production of progesterone</td>
</tr>
<tr>
<td>OVARIAN TISSUE</td>
<td>OESTROGEN</td>
<td></td>
</tr>
<tr>
<td>PITUITARY</td>
<td>FOLLICLE STIMULATING</td>
<td></td>
</tr>
<tr>
<td></td>
<td>HORMONE</td>
<td></td>
</tr>
</tbody>
</table>

15. The diagram below shows stages in mitotic cell division.

i) Name stages A and B. (2 marks)

A_______________________________________________________________________
B_______________________________________________________________________

ii) What is the significance of mitosis in living organisms. (2 marks)

_______________________________________________________________________
_______________________________________________________________________

16. State the importance of each of the following features in animals

a) Solid food being broken into small pieces. (1 mark)

_______________________________________________________________________

b) Presence of caecum in herbivorous mammals. (1 mark)

_______________________________________________________________________

c) Long ileum in man. (1 mark)

_______________________________________________________________________

17. Name two structures for gaseous exchange in aquatic plants. (2 marks)

_______________________________________________________________________

_______________________________________________________________________
18. State one of each of the following plant excretory products. (2 marks)
   a) Tannin__________________________________________________________
   b) Papain_________________________________________________________

19. Name the method by which excess water is excreted from plants leaf surface in liquid form. (1 mark)

20. Name the fluid that is produced by sebaceous glands. (1 mark)

   i) State two roles of the fluid stated above. (2 marks)

21. The diagram below shows a pollen tube as it develops down in the style.

   M

   N

   a) Name the part labelled M and N. (2 marks)

      M_____________________________________________________________________

      N_____________________________________________________________________

   b) State the functions of the part labelled M (1 mark)

      ________________________________________________________________

22. Distinguish between (2 marks)
   a) Protandry and protogyny

      Protandry                     Protogyny
      ________________________________________________________________

   b) What is the importance of metamorphosis (2 marks)

      ________________________________________________________________

23. a) Name one end products of anaerobic respiration in plants. (1 mark)

   b) $C_6H_{12}O_6 \rightarrow \text{Substrate R + } 2\text{CO}_2 + 210\text{ KJ}$
i) Give the identity of substance R. (1 mark)

ii) Give an equivalent of substrate R in animals produced in a similar process. (1 mark)

c) Explain the term obligate anaerobes. (1 mark)

24. Briefly describe how the belt transect can be used in estimating the population of a shrub in a grassland. (3 marks)

25. Explain the following terms in reference to its members
   a) Order (1 mark)
   b) Genus (1 mark)

26. Name two end products from light reaction that are used in dark reaction. (2 marks)
   i) ___________________________________________________________________
   ii) ___________________________________________________________________

b) Name the structural units of lipids. (1 mark)

   c) State two important functions of lipids in living organisms. (2 marks)

27. a) State the function of tricuspid valves of a mammalian heart. (1 mark)

b) Explain why the heart muscles are said to be myogenic. (1 mark)

   c) Name the blood vessel that supply blood to
   i) Head (1 mark)
28 a) What is seed dormancy

b) Define the term apical Dominance.

29. Explain the following concepts as used in evolution
a) Adaptive radiation.

b) State two advantages of natural selection to organisms.

c) Explain how biology is an evidence to organic evolution.