INSTRUCTIONS TO CANDIDATES

1. Write your name, index and ADM Numbers in the spaces provided above.
2. Sign and write date of examination in the spaces provided above.
3. Answer ALL questions in the spaces provided.
4. All workings MUST be clearly shown where necessary.
5. This paper consists of 11 (Eleven) Printed pages.
6. Candidates should check the question paper to ensure that all the papers are printed as indicated and no questions are missing

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1. The diagram below represents a cross-section of the stem of a certain plant.

(a) Name the structures labeled M and N.  

M  
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N  
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(b) State the class to which the plant above belongs.  

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

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2. The diagram below represents a germinating seedling.

(a) Name the parts labeled B.  

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(b) Name the type of germination represented by the diagram above. (1 mk)

(c) Give two functions of the part labeled A. (2 mks)

3. The diagram below shows the structure of an organelle that is involved in aerobic respiration.

(a) State the function of the organelle. (1 mk)

(b) Outline two adaptations of the above organelle. (2 mks)

4. Name an instrument used to measure the following environmental factors:
   (a) Light penetration in water. (1 mk)
   (b) Strength and direction of wind at the same time. (1 mk)

5. Distinguish between continuous and discontinuous variation. (2 mks)

6. Name a hormone that is responsible for the following processes in arthropods:
   (a) Moulting. (1 mk)
   (b) Formation of cuticle. (1 mk)
7. (a) Name a hormone involved in ionic balance in the human body.  
……………………………………………………………………………………………………………………………………………………..
(b) Njoka was found to be passing out large amount of urine which also had a lot of glucose in it.  
Name the disease he was likely to be suffering from.  
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8. The diagram below represents a certain organism.

(a) Name the division to which the organism belongs.  
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(b) Give two functions of the part labeled E.  
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9. The diagram below represents a section of a certain strand.

| C | G | U | A | C | A |
(a) Identify the type of strand represented above.  
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(b) Give a reason for your answer in (a) above.  
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(c) Write down the base sequence of the complementary strand from which the section was obtained.  
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10. State two differences between class chilopoda and class diplopoda.  
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11. Give two reasons why Mendel chose to use garden pea plant in his experiment.  
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12. The diagram below represents a stage of cell division.

(a) Identify the stage of cell division represented above.  
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(b) State two differences between meiosis and mitosis.  
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13. Peter was using a light microscope to view onion cells with lens combination of eye piece lens X10 and objective lens X20.
   (a) Calculate the total magnification. 
       
   (b) If he changed the objective lens magnification to X40, would the cells appear bigger or smaller? Explain.

14. A sheep was found to be heavily infested with tapeworms.
   (a) Write down a food chain to represent energy flow in the above relationship.
   (b) What is the trophic level of tapeworms in the above relationship?

15. State two characteristics of the cell membrane.

16. State the mode of asexual reproduction exhibited by the following organisms:
   (a) Yeast.
   (b) Mushroom.
   (c) Name the causal organism that cause the following diseases:
       i. Amoebiasis.
ii. Syphilis. (1 mk)

17. Which term is given to the condition of:
   (a) A plant cell when the protoplasm is pressing outwards on the cell wall on the absorption of water by osmosis. (1 mk)

   (b) Partial collapse of cell due to water loss by osmosis. (1 mk)

18. The diagram below represents an embryo sac.

   a) Name the parts labeled J and K. (2 mks)

   J

   K

   b) Differentiate between protandry and protogyny. (2 mks)

19. Which organelle would be abundant in:
   (a) Skeletal muscle. (1 mk)
20. What is parthenocarpy?  

21. State **two** factors that affect the rate of active transport.  

22. Differentiate between interspecific and intraspecific competition.  

23. Below is a structure found in plants.  

a) Name the organelle.  

b) What is the role of the organelle you have named in (a) above.  

c) Name the parts labeled **J** and **L**.  

**J**
24. Name **two** forces involved in the movement of water and mineral salts.  

25. What characteristics of living organisms is represented by the following characteristics:  
   a) A cat producing kittens.  
   b) A girl dropping a hot pan.  
   c) The exhalation of carbon (IV) oxide.

26. The diagram below represents the alveolus.  

   (a) Identify O, P and Q.  

   (b) Identify gas Y.
27. Sigei set up the following experiment to investigate an aspect of germination.

Flask A
- Vacuum flask
- Germinating seeds
- Wet cotton wool
- Thermometers

Flask B
- Vacuum flask
- Boiled seeds

a) What was Sigei investigating? 
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b) State the purpose of the vacuum flasks used in this experiment instead of an ordinary flasks. 
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28. Besides excretion give one functions of the liver. 
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29. The diagram below represents a transverse section of a maize grain.

(a) Name the parts labeled H and I.  

H ……………………………………………………………………………………………………………………………………………..  
I ……………………………………………………………………………………………………………………………………………..  

(b) If a drop of iodine was placed on the section, which part would stain blue-black?  

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