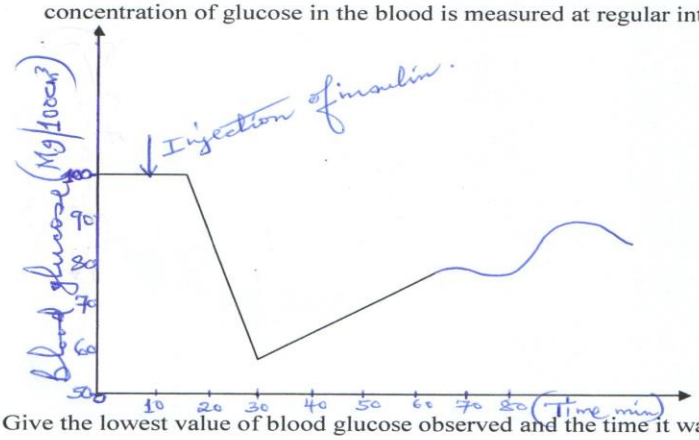
FORM 3 END TERM 2 2020

BIOLOGY PAPER 2

SECTION A(60MKS)

Answer all the questions in this section in the spaces provided.

1. The graph below shows the effect of injecting one unit of insulin into a person. The concentration of glucose in the blood is measured at regular intervals.



a. Give the lowest value of blood glucose observed and the time it was recorded.(1mk)

b. Explain the fall in blood glucose level.(2mks)

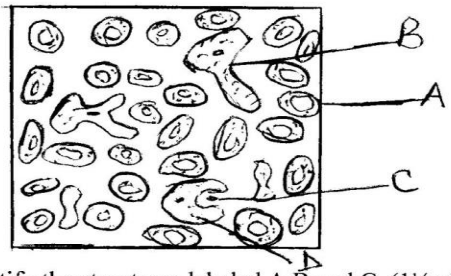
c. Name the mechanism that led to the increase in blood glucose level when it had been falling.(1mk)

d. Name the hormone responsible for the conversion of glycogen to glucose.(½mk)

e. State the effect of each of the following in human beings.
   i. Too much glucose in the blood(1mk)

ii. Very little glucosein the blood(1mk)

2. The diagram below shows a smear of blood on a microscope slide.



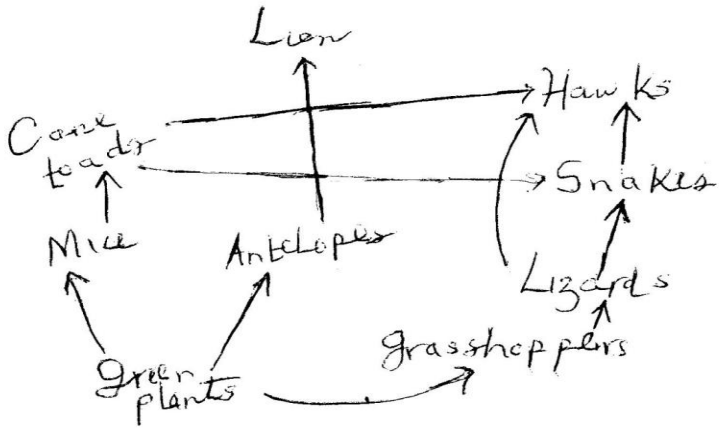
a. Identify the structures labeled A,B and C .(1½mk)
   A-
   B-
   C-

b. State the importance of the large number of structures A in the blood smear.(1mk)

c. Name the process by which structure D would engulf C and state its importance.(1½mks)

d. State one adaptation of the structure labeled A to its function.(1mk)

3. The flow chart below shows a food web in a terrestrial ecosystem.



a. From the food web, construct a food chain with five organisms.(1mk)

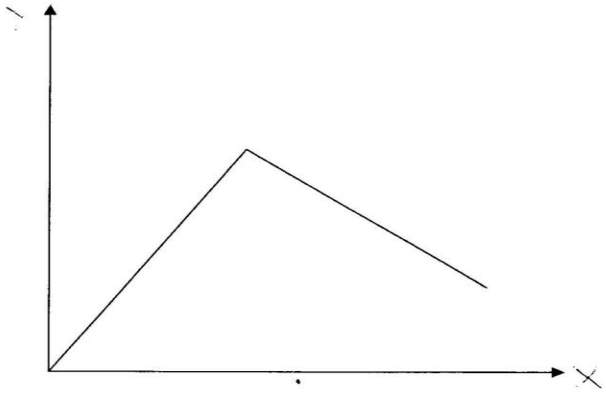
b. Name the trophic level occupied by:
   i. Hawks(½mks)

   ii. Cane toads(½mk)

c. What would happen if leopards were introduced into the ecosystem.(2mks)

4. Describe the processes that occurs in the chest cavity during inspiration.(6mks)

5. The graph below represents the effect of temperature on the rate of photosynthesis.

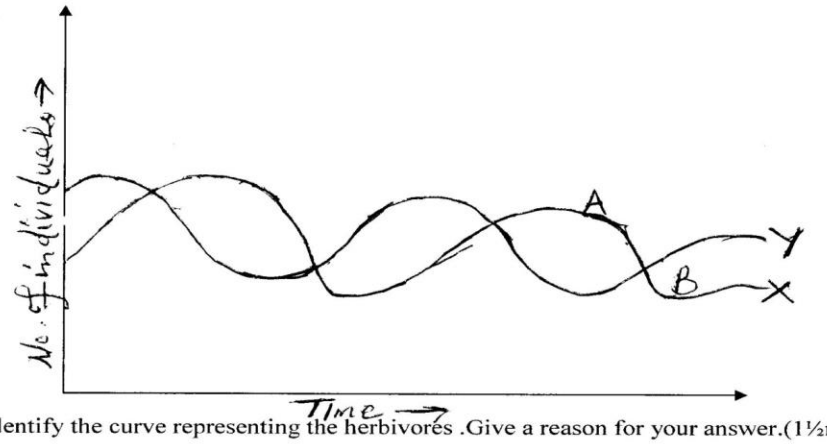


a. On the diagram, label the axes(1mk)

b. Comment on the general trend of the graph.(2mks)

c. List two other factors that may affect the shape of the graph.(2mks)

6. The graph below shows the relationship between number of herbivores and carnivores in a park.



a. Identify the curve representing the herbivores .Give a reason for your answer.(1½mk)

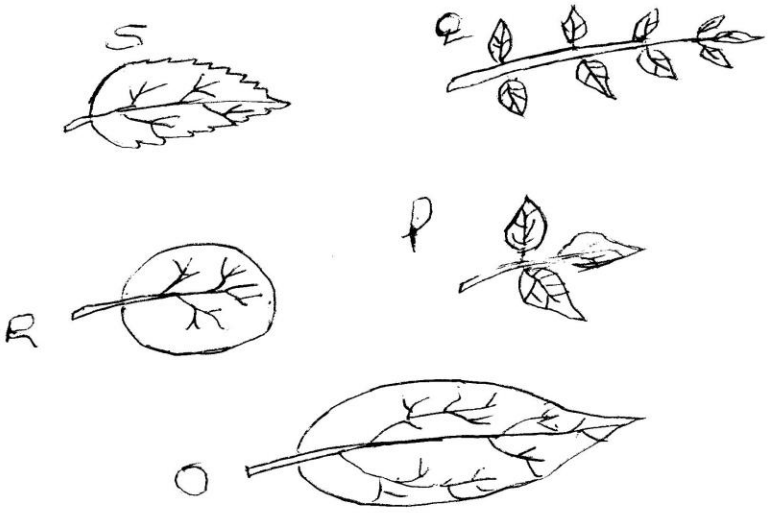
b. Suggest a reason for the slope of graph x between points A and B.(2mks)

c. I)Name the relationship between the two types of organisms as portrayed by the graph.(1mk)

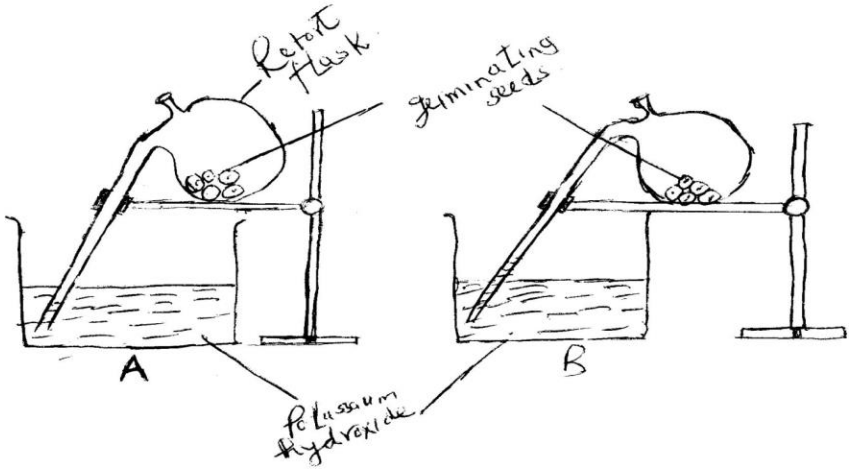
ii)State the significance of the relationship you have stated in (c)(i) above.(1mk)

d. Describe the long-term effect on the parks ecosystem if the species of the carnivores were to become extinct.(2mks)

7. Use the diagrams of leaves below to construct dichotomous keys. Identify the steps you followed to identify leaves O,P,Q and R.(12mks)



8. In an experiment, germinating pea seeds were put in a retort flask which was placed in a beaker containing potassium hydroxide solution as shown in diagram A below. At the end of the experiment, the results were as shown in diagram B.



a. Suggest the aim of the experiment(1mk)

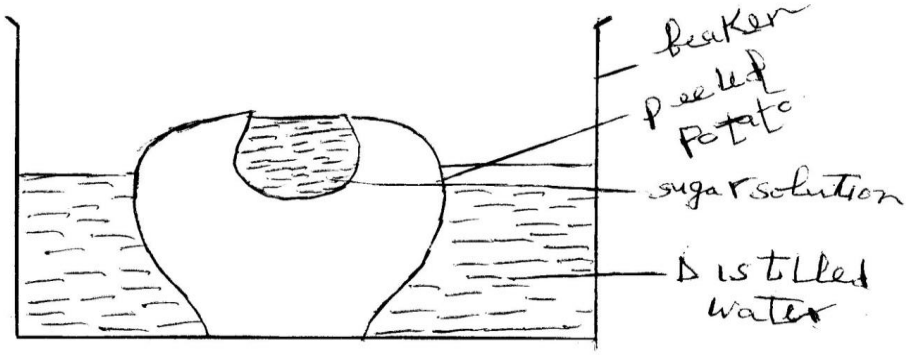
b. State the observable changes that occurred as shown in the diagram .(2mks)

c. Account for the changes noted in (b) above.(3mks)

d. Name the chemical process taking place in the peas.(1mk)

e. How would a control for this experiment be set.(1mk)

9. A group of students set up an experiment to investigate a certain physiological process as shown in the figure below. After some time, the students observed that the level of the sugar solution had risen.



a. What physiological process was being investigated?(1mk)

b. Account for the rise in the sugar solution in the experiment.(2mks)

c. Suggest with a reason the results that the students would obtain if they repeated the experiment using a piece of boiled potato.(1mk)

d. Explain why the cells of the potato above, would not burst when immersed in distilled water and left for some time.(2mks)

SECTION B(20MKS)- Compulsory.

10. Leaves were collected from the plant of a certain species growing in a shaded site and a plant from the same species growing in an open site. The surface area of each leaf was worked out. The results obtained are shown in the table below.

Surface area of leaves(cm^3)	
Shaded site	Open site
21	15
14	17
16	18
18	17
19	17
21	19
19	13
22	14
18	21
16	13
13	16
22	13
21	16
23	12
19	14
18	22
15	20
Mean surface area = x_1	Mean surface =x_2

a. Calculate the mean score x_1 and x_2(2mks)

b. Suggest one reason for the differences in the mean surface areas between the leaves from the two sites. Explain your answer.(2mks)

c. Briefly state the adaptations of plant leaves to a desert habitat.(6mks)

d. The leaves of a plant exposed directly to sunlight are often thicker than leaves found in the shade. Suggest two reasons for this observation.(2mks)

e. How does the observation in (d) improve the efficiency of leaves exposed to direct sunlight?(2mks)

f. Apart from photosynthesis, state two other functions of a leaf.(2mks)

g. State how a leaf is adapted for the functions you have stated in (f) above(3mks)

h. Some plants have rolled leaves. Explain the importance of such leaves to the plant.(1mk)

SECTION C(20MKS)

Select and answer only one questions in this section in the spaces provided.

11. a) Explain how the gills of a fish are adapted to the process of gaseous exchange.(5mks)

b)Describe the mechanism of gaseous exchange in the gills of a bony fish(15mks)