**Name……………………………………………………… Index No………………………..**

231/2

BIOLOGY **Date……………………………**

(Theory)

YEAR 2020 **Sign……………………………**

**2 hours**

KENYA NATIONAL EXAMINATIONS COUNCIL

(*Kenya Certificate of Secondary education*)

***INSTRUCTIONS TO CANDIDATES***

a) The paper has 2 sections A and B

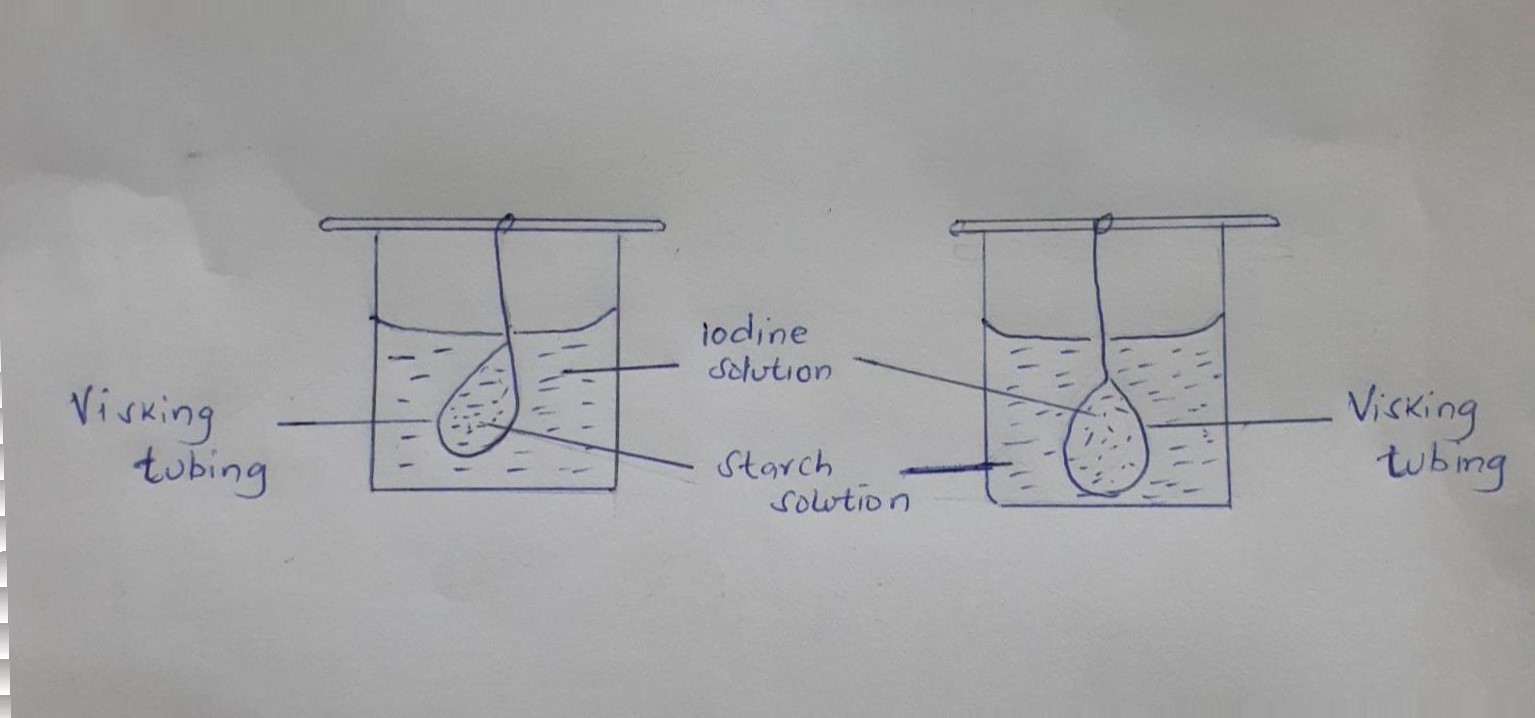
b) Answer all questions in section A in the spaces provided

c) In section B answer question 6 (compulsory) and either question 7 or 8 in the spaces provided after question 8

**FOR EXAMINERS USE ONLY**

|  |  |  |  |
| --- | --- | --- | --- |
| **SECTION** | **QUESTION** | **MAXIMUM SCORE** | **CANDIDATE’S SCORE** |
| **A** | **1** | **8** |  |
| **A** | **2** | **8** |  |
| **A** | **3** | **8** |  |
| **A** | **4** | **8** |  |
| **A** | **5** | **8** |  |
| **B** | **6** | **20** |  |
| **B** | **7** | **20** |  |
| **B** | **8** | **20** |  |
|  | **TOTAL SCORE** | **80** |  |

1. To demonstrate a certain physiological process, the following set of apparatus were assembled

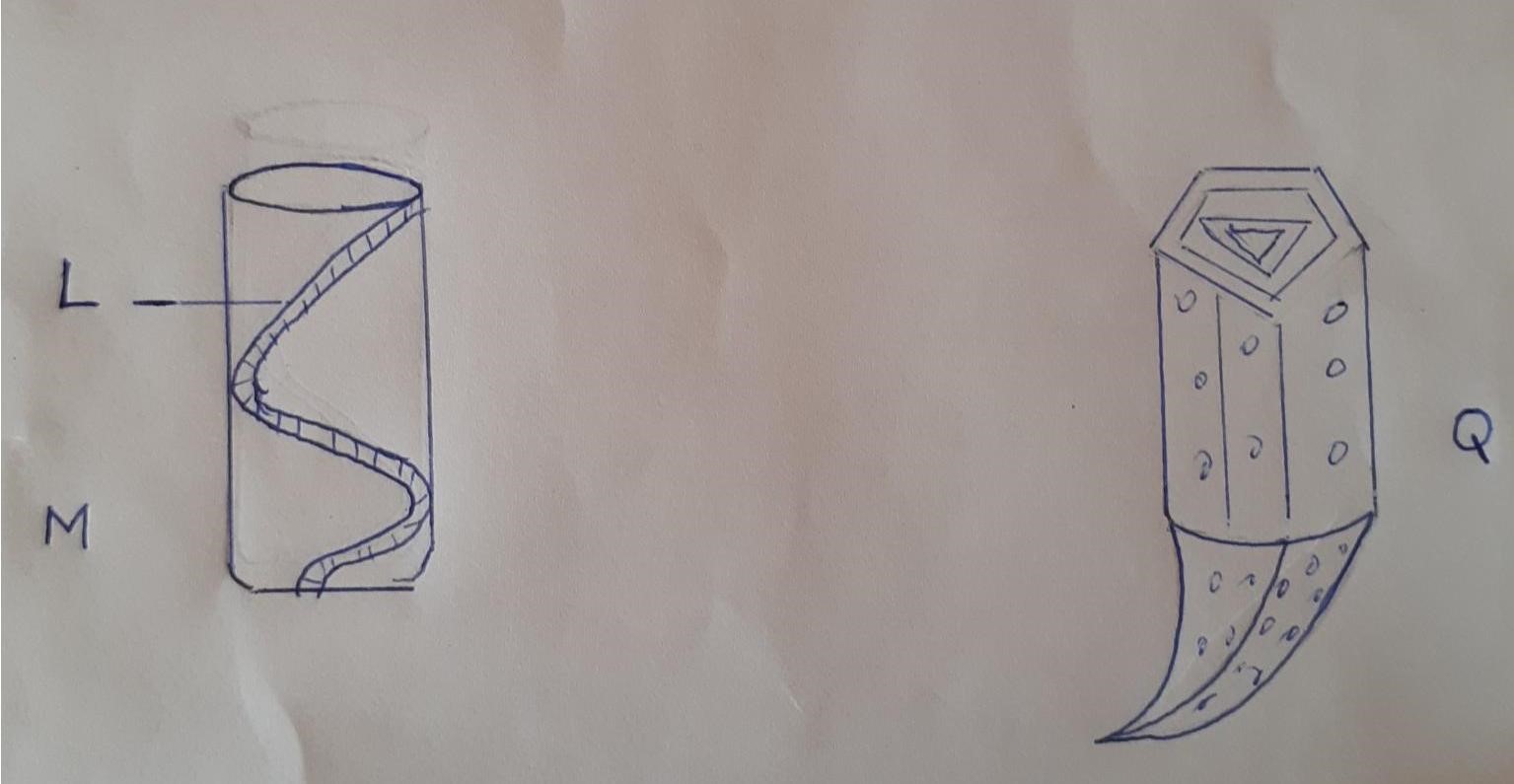


After 20 minutes observation were made and recorded as follows

|  |  |  |
| --- | --- | --- |
| Experiment | Observation | |
|  | Inside tubing | Outside the tubing |
| I | Blue black colour | No colour change |
| II | No colour change | Blue –black colour |

1. Name the physiological process being investigated. [1mk]
2. Account for the results as recorded in the above table in experiment. [2mks]

5. What would have been the result if experiment l was repeated using starch that had been boiled with dilute hydrochloric acid, explain your results. [3mks]
6. Below are diagrams of water conducting tissues found in plants;



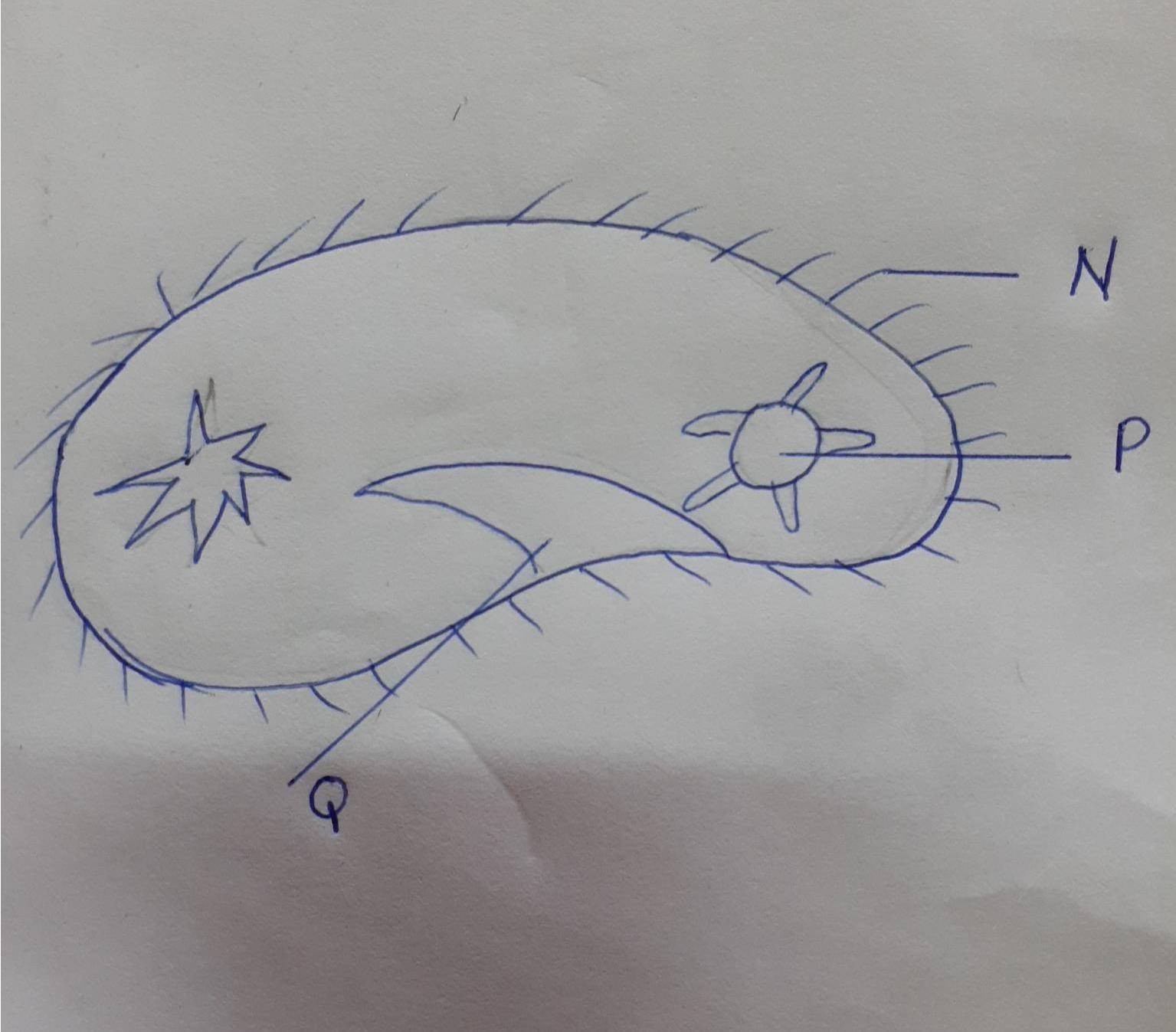
1. Name the plant tissues labelled. [2mks]

M

Q

1. Name the material that thickens the part labeled L. [1mk]
2. State three adaptations of the tissue labelled M. [3mks]

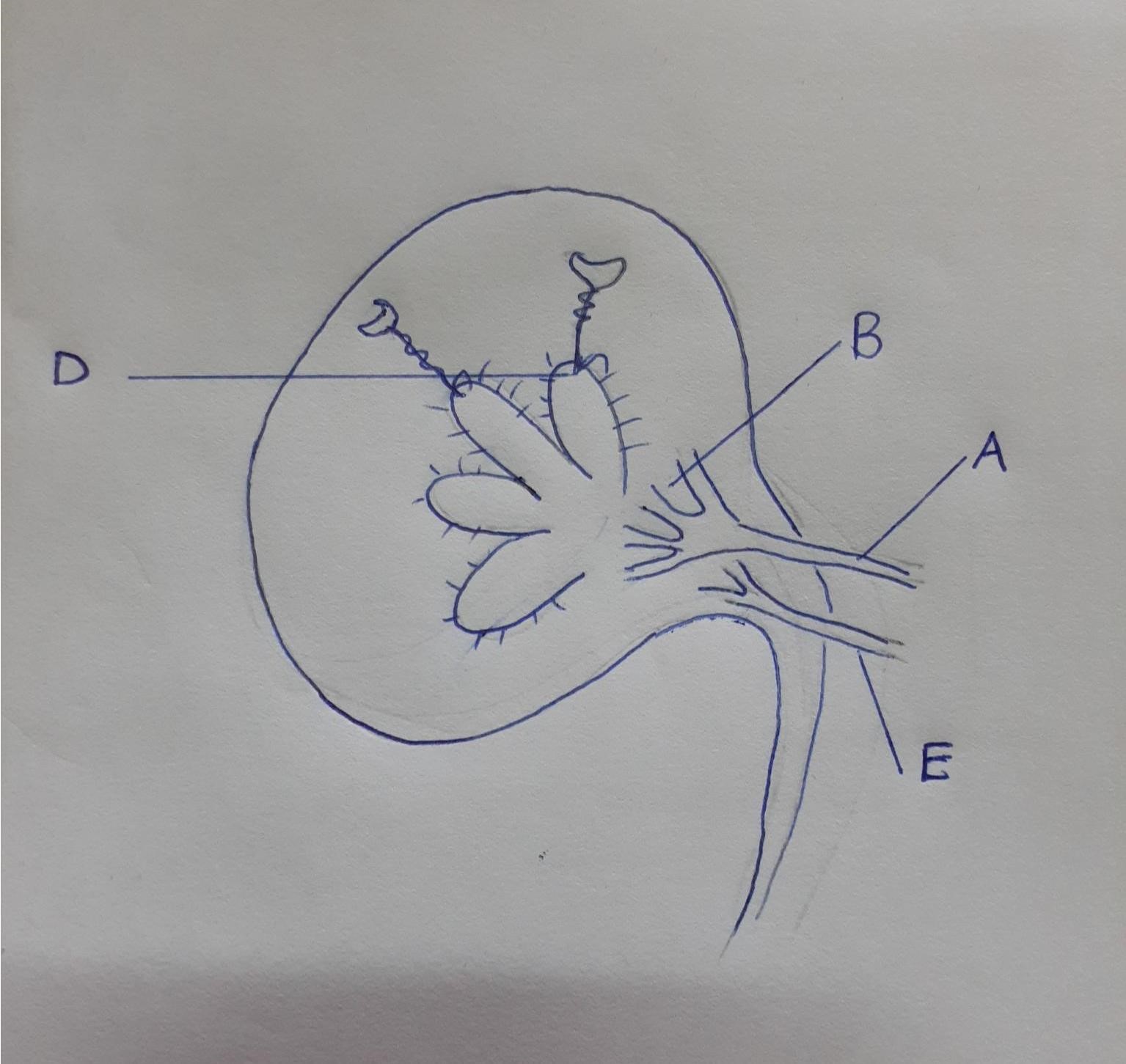
1. Tissue Q is less efficient in conduction than M; Explain [1mk]
2. Name one other pattern of lignification that occurs in the tissue labelled M. [1mk]



1. i. Name the kingdom to which the organism belongs. [1mk]
2. Give a reason for your answer in a [i] above. [1mk]

Name the structures labeled N P and Q. [3mks]

1. State one observable features that enable the organism to move fast. [1mk]
2. State two economic importance of the kingdom in a [i] above. [2mks]
3. The figure below represents a mammalian organ.



1. State the name of the part labeled. [2mks]
2. A
3. B
4. State how the part labeled D would vary in a desert rat and fresh water fish. [2mks]
5. State two differences in composition of blood between A and E. [2mks]
6. State two functions of the above organ. [2mks]
7. a. What is meant by the term linked genes. [1mk]

b. Hemophilia is a genetic condition transmitted through a recessive gene linked to the **x** chromosome the normal gene may be represented by **xh**

1. What is the genotype of a hemophiliac female? [1mk]

A woman who is a carrier for the hemophilia gene marries a normal man. Work out the phenotypic for their offspring. [4mks]

* 1. Hemophilia is more common in males than in females. Explain this phenomenon.[2mks]

**SECTION B [40 MARKS], Qn. 6 is compulsory and either Qn. 7 or 8**

1. In an experiment to investigate certain processes in a given plant species, the rates of carbon [IV] oxide released and intake were measured over a long period of time. The results of the investigation were as shown below

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Time of the day [hours] | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 |
| Volume of CO2 consumed in mm3 | 10 | 43 | 69 | 91 | 91 | 50 | 18 | 0 | 0 | 0 |
| Volume of CO2 released in mm3 | 38 | 22 | 10 | 3 | 3 | 6 | 31 | 48 | 48 | 48 |

1. On the same axes draw graphs of volume of carbon [IV] oxide consumed and released against time. [7mk)
2. Name the process that lead to:
3. Carbon [IV] oxide consumption. [1mk]
4. Carbon [IV] oxide production. [1mk]

1. Account for the shape of the curve for;
2. Carbon [IV] oxide consumed. [3mks]
3. Carbon [IV] oxide released. [3mks]
4. What is meant by compensation point. [1mk]
5. From the graph, find the times of the day when the plants attained compensation point. [2mks]
6. Explain how temperature affects the rate of carbon [IV] oxide consumption in the plant. [2mks]
7. Describe the process of protein digestion absorption and assimilation in human beings. [20mks]
8. Describe how fruits and seeds are adapted to water and wind dispersal. [10mks]

Describe two roles in each of the following hormones in growth and development of plants. [10mks]

* 1. Auxin
  2. Ethylene
  3. Cytokinins
  4. Gibberellins
  5. Abscicic acid