1. The diagram below shows an experimental set up to investigate an aspect of germination. *TRZ*

   ![Diagram of experimental setup]

   (i) Why are the following used in this experiment?
   (ii) Moist cotton wool?

   (b) (i) With reference to points x and y state the direction the dye would move towards during the experiment.
   (ii) Give reasons for your answer in (b) (i)

2. An experiment was carried out to determine the rate of transpiration in three plants R, S and T. Plant S and T belong to different species while plants R and T belong to the same species. Plant R had all its leaves removed. The three plants were of similar size and were exposed to the same environmental conditions. The results are represented by the graphs below.

   ![Graphs showing weight of plants over time]

   (a) Suggest possible environmental conditions under which the experiment was carried between O and 40 minutes.
   (b) Account for the results obtained for plant R.
   (c) Giving reasons, suggest the habitats for plant.
   (i) S. Reason
   (ii) T. Reason

3. The diagram below shows a section of the functional unit of a mammalian kidney. *TRZ*
a) Identify the structure drawn. 1mk
b) Name the parts labeled J and M.
   i) J
   ii) M 2mks
c) What causes the process that occurs in structure L? 1mk
d) What is the difference in the composition of fluids in structure K and O? 1mk
e) State three adaptations of part N to its function. 2mks
f) State two adaptations that desert animals have to reduce water loss through urine. 2mks

4. The diagram below shows two internal sections of the human intestines

   a) Name the part of the intestines represented by
      i) Fig P 2mks
      ii) Fig Q
   b) What observable structural feature forms the basis of identifying the figures P and Q? 1mk
   c) State two functions of the part represented by Fig. P 2mks
   d) State four adaptations possessed by the part represented by Fig. P for its functions. 4mks
   e) State one function of the part represented by Fig. Q. 1mk

5. The chart below shows a feeding relationship in a certain ecosystem.

   a) Construct a food chain ending with snakes as
      i) Secondary consumer 1mk
      ii) Tertiary consumer 1mk
b) Which organism in the food-web has
(i) the highest variety of predators 1mk
(ii) the highest variety of preys. 1mk

c) Name the organisms that will be directly affected if:
(i) there was prolonged drought. 1mk
(ii) the area was sprayed with insecticides 1mk

SECTION B (40 MARKS)

6. The following data represents the development in dry mass of seedlings for a period of 18 weeks.

<table>
<thead>
<tr>
<th>Time in weeks</th>
<th>0</th>
<th>2</th>
<th>4</th>
<th>6</th>
<th>8</th>
<th>10</th>
<th>12</th>
<th>14</th>
<th>16</th>
<th>18</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry mass in g</td>
<td>2.8</td>
<td>4.0</td>
<td>6.0</td>
<td>10</td>
<td>18</td>
<td>32</td>
<td>44</td>
<td>46</td>
<td>44</td>
<td>40</td>
</tr>
</tbody>
</table>

a) Using a suitable scale, plot a graph of dry mass against time. 6mks
b) With reference to growth explain the changes in dry mass between
(i) Week 0 and week 4. 2mks
(ii) Week 6 and week 12 2mks
(iii) Week 14 and week 18 2mks

c) With a reason state the difference in results that would be expected from the above if the experiment started with the seeds. 2mks

d) Describe how you would carry out the procedure to obtain dry mass in the respective weeks. 4mks

e) State one advantage and one disadvantage of using mass instead of fresh weight in estimating growth of an organism. 2mks

7. a) Explain how blood is involved in transport. Stating the constituents of blood involved. 14mks

b) Describe how blood protects the body. 4mks

c) Identify two sites in the mammalian body where blood is manufactured. 2mks

8. Explain how
(a) Fresh water fishes are adapted to overcome the problem of osmoregulation. 4mks
(b) Predators are adapted to apprehend their prey. 4mks
© Xerophytes are adapted to their habitat. 12mks