S2 Biology PLANTS TEST PRACTICE QUESTIONS

**DO NOT WRITE ON THESE SHEETS**

 GRAPH PAPER NEEDED booklet number

1. The diagram below represents part of a cross section through a leaf.

Identify one example of each of the cells described below by using letter from the diagram

a) transparent cells

b) cells which carry out photosynthesis

c) mesophyll cells

d) guard cells



2. The diagrams on the right show four different experiments used in an investigation into the conditions needed for photosynthesis.

a) The results from **which two experiments** should be compared to show that light is needed for photosynthesis?

b) Explain your choice of experiments in question a).

c) Name the two raw materials for photosynthesis.

d) Name the green pigment in plant cells that traps the energy in light for photosynthesis.

e) Name the two products of photosynthesis.

f) One of the products of photosynthesis is stored as starch. Name the chemical used to test for starch.

*REMEMBER TO MARK YOUR WORK REGULARLY*

3. The results below are from an investigation using Elodea (pond weed).

The aim of the investigation was to find out the effect of changing the light intensity on the rate of photosynthesis. The rate of photosynthesis was measured by counting the number of bubbles produced per minute.

a) Why do you think the two results in red have been highlighted?

b) Calculate the average for each of the 10 light intensity % and present the information in a table (DO NOT REWRITE THE DATA FOR THE 5 TRIALS)



c) On graph paper draw a line graph of the **average** results.

4. Plant leaves were placed in tubes as shown below. The tubes where left in bright light.



For each numbered tube state which processes will take place in the leaf. Chose from -

1. Only photosynthesis
2. Only respiration
3. Both
4. Neither

*REMEMBER TO MARK YOUR WORK REGULARLY*

5. The following graph shows the effect of increasing carbon dioxide concentration on the rate of photosynthesis at two different temperatures.



a) Why was it important to keep all factors, other than carbon dioxide concentration, constant in this experiment?

b) From the evidence in the graph, what are the limiting factors at

i) point X?

ii) point Y?

c) Describe how the rate of photosynthesis could be measured.

6. Decide if the following statements are TRUE or FALSE.

For FALSE statements state ***the word(s) that would replace the underlined word(s)*** to make the statement TRUE.

a) Repeating an investigation several times and calculating an average improves the accuracy of the results.

b) To calculate a percentage, add up all the values and divide the total by the number of values.

c) In a fair test there is only one input variable.

*REMEMBER TO MARK YOUR WORK REGULARLY*

7. Two gardeners compared their tomato crops. Both grew 10 plants of the same variety in a greenhouse.

One gardener altered the environmental conditions in his greenhouse to increase the rate of photosynthesis. His plants yielded 720 tomatoes. The other gardener only produced 480 tomatoes.

a) What was the percentage increase in the yield of tomatoes when the rate of photosynthesis was increased? *[show your workings]*

CLUE % change = change / original x 100

b) Describe **two** changes to the environmental conditions in the greenhouse which could have increased the rate of photosynthesis.

8. In An investigation into the effect of temperature on seed germination, six dishes were set up as shown below. Each dish contained 20 seeds.



Each dish was left for five days at a different temperature and then examined to see how many seeds had germinated. The results are shown in the table below.

|  |  |
| --- | --- |
| temperature (oC) | seeds germinated |
| 10 | 2 |
| 15 | 10 |
| 20 | 16 |
| 25 | 12 |
| 30 | 2 |
| 35 | 0 |

a) Calculate the percentage germination for each temperature and present the data as a table

b) What is the input variable in this investigation?

c) List the variable that must be kept the same to make sure it is a fair test.

d) What feature of this test increased the reliability of the results?

e) Use your table from questions a) to draw a line graph.

f) What is the effect of temperature on seed germination?

*REMEMBER TO MARK YOUR WORK REGULARLY*

9. An investigation was carried out into the effect of the concentration of a plant growth substance on shoot growth in seedlings. The length of each shoot was measured at the start of the investigation.

Seven solutions of the plant growth substance, each with a different concentration were prepared. Ten seedling were placed in each solution. A further 10 seedlings were placed in distilled water.



After three days, the shoots were measured again and the results recorded in the table.

|  |  |
| --- | --- |
|  | concentration of plant growth substance (ppm) |
|  | 0 | 0.0001 | 0.001 | 0.01 | 0.1 | 1 | 5 | 10 |
| average length of shoot at start (mm) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| average length of shoot after three days (mm) | 10.0 | 10.0 | 10.4 | 12.3 | 17.0 | 11.6 | 9.6 | 6.3 |

a) For the distilled water (0 ppm) and each concentration of the plant growth substance calculate the average increase in shoot length and present this data in a table.

[NB this is not a calculation of an average! Look carefully at the row headings in the table above]

b) For the plant growth substance concentrations from 0.0001ppm to 10 ppm describe the relationship between the concentration of the plant growth substance and the average increase in shoot length.

c) Suggest why a set of seedlings was grown in distilled water (0 ppm).

10. The graph below shows the effect of carbon dioxide concentration on the growth of plants.

a) How was the growth of plants measure in this investigation?

b) Use data from the graph to describe the relationship between CO2 and the growth of plants.

c) Name TWO limiting factors in photosynthesis other than CO2.

11. Read the following passage carefully and answer the following questions .



a) Name **two** natural causes of increased antioxidant levels in fruit and vegetables.

b) Give **two**  treatmenst carried out by scientists to increase the production of antioxidants in potatoes.

c) State one benefit of antioxidants for plants.

d) Name one antioxidant found in potatoes.

e) Explain how antioxidants reduce the risk of cancer.

f) Give **one** other benefit of antoxidants in our diet.

THE END