

Question A1.1 Based on the measured data you collected in the table above, determine the closest average values at each time point in each condition!

(16 points)

Write the letter of the correct answer in the box!

Treatments	Answer
Control 9:00 a.m.	B
Drought stress 9:00 a.m.	A
Control 10:00 a.m.	C
Drought stress 10:00 a.m.	A
Control 12:00 a.m.	D
Drought stress 12:00 a.m.	B
Control 3:00 p.m.	D
Drought stress 3:00 p.m.	C

Question A1.2 Based on the average values, calculate the actual size (size in real life) of the stomatal pores in control and drought-stressed plants at 9:00 a.m. and 3:00 p.m.!

(4 points)

In case the student used his/her own data, instead of using the values provided in 'Question A.1.1' and the result falls in the range shown in the second column, give only **0.5 point** for each row, **instead of 1 point**.

	Each correct (only exact number can be accepted) answer 1 point	Each answer between the range is 0.5 point
Treatments	Means (μm)	Means (μm)
Control 9:00 a.m.	8.43	6.20-9.45

Drought stress 9:00 a.m.	8.1	5.20-9.20
Control 3:00 p.m.	9.86	7.65-10
Drought stress 3:00 p.m.	4.3	2.50-4.75

Question A1.3 Calculate how much did the stomatal pore size change under 6 hours as an effect of drought stress! Provide the answer in μm !

(2 points)

In case the student used his/her own data, instead of using the values provided in 'Question A.1.1' and the result falls in the range shown in the second column, give only **1 point, instead of 2 points.**

The correct (only exact number can be accepted) answer 2 points	The answer between the range is 1 point
Result (μm)	Result (μm)
3.8	2.1-4.75

Question A1.4 Calculate the stomatal opening of drought-stressed plants at 3:00 p.m. to the control at 3:00 p.m.! Provide the answer in percentage (control plants are 100% open)!

(2 points)

In case the student used his/her own data, instead of using the values provided in 'Question A.1.1' and the result falls in the range shown in the second column, give only **1 point, instead of 2 points.**

The correct (only exact number can be accepted) answer 2 points	The answer between the range is 1 point
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Result (%)	Result (%)
43.61	39.50-49.00

Question A1.5 Based on the experimental results, how is the physiological status in the leaves of drought stress-treated plants at 9:00 a.m. compared to the control?

(2 points)

Write the letter of the correct answer in the box!

A

Question A1.6 Based on the experimental data, what physiological change could be observed in the leaves of drought stress-treated plants at 3:00 p.m. compared to the control?

(3 points)

Write the letter of the correct answer in the box!

D

Question A1.7 In terms of drought stress tolerance the breeding of what types of plant species could be an aim for scientists?

(3 points)

Write the letter of the correct answer in the box!

D

Problem A2

Question A2.1 Identify the photosynthetic pigments in the control sample by numbering from top of the chromatography paper! Write the letter of the appropriate pigment to the corresponding numbers in the field:

(12 points)

Order	Pigment
1.	C
2.	D
3.	A

4.	B
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Question A2.2 Measure the vertical width of each pigment streak with a ruler on the chromatographs and determine which pigments' amount altered due to the prolonged drought stress compared to the control!

(10 points)

Write the letter of the correct answer in the box!

Findings	Answer
The amount of chlorophyll <i>b</i> in the drought stress-treated plants compared to the control:	B
The amount of chlorophyll <i>a</i> upon stress compared to the control:	B
The ratio of chlorophyll <i>a/b</i> as a result of prolonged drought stress:	B
The amount of carotene in the drought stress-treated plants compared to the control:	B
The amount of xanthophylls as a result of prolonged drought stress compared to the control:	B

Question A2.3 Based on the experimental results, what physiological alteration could be detected in the leaves of drought stress-treated plants at 3:00 p.m.?

(6 points)

Write the letter of the correct answer in the box!

C

Question A2.4 In terms of drought stress tolerance the sublimation of what types of plant species could be an aim for breeders?

(4 points)

Write the letter of the correct answer in the box!

C

Problem A3

Question A3.1 Calculate how much absolute ethanol (100%) and distilled water will you need for the solution!

(4 points)

Write the letter of the correct answer in the box!

B

Question A3.2 Calculate how much 80% ethanol and proline stock solution will you need!

(9 points)

Write the letter of the correct answer in the box!

C

Question A3.3 Determine the color reaction of proline on the isatin test paper!

(8 points)

Write the letter of the correct answer in the box!

D

Question A3.4 Calculate the proline concentration of the dilution!

(4 points)

Write the letter of the correct answer in the box!

C

Question A3.5 Determine the color reaction of the extracts of plant samples on the isatin test paper!

(4 points)

Write the letter of the correct answer in the box!

B

Question A3.6 Calculate the proline concentration in the plant samples! Use the previous calibration (A3.4. and A3.5.)!

(3 points)

Write the letter of the correct answer in the box!

B

Question A3.7 What could be the purpose of proline detection?

(4 points)

Write the letter of the correct answer in the box!

D