



NATIONAL SENIOR CERTIFICATE EXAMINATION
SUPPLEMENTARY EXAMINATION – MARCH 2018

LIFE SCIENCES: PAPER III

MARKING GUIDELINES

Time: 1½ hours

50 marks

These marking guidelines are prepared for use by examiners and sub-examiners, all of whom are required to attend a standardisation meeting to ensure that the guidelines are consistently interpreted and applied in the marking of candidates' scripts.

The IEB will not enter into any discussions or correspondence about any marking guidelines. It is acknowledged that there may be different views about some matters of emphasis or detail in the guidelines. It is also recognised that, without the benefit of attendance at a standardisation meeting, there may be different interpretations of the application of the marking guidelines.

PART 1 INVESTIGATION

13. Temperature value and units. (1)

18. Heading: Table to show the firmness and change in length of potato cylinders in varying salt concentrations

Table neatness, layout of lines and clarity

Column headings: Firmness, lengths before and after

Units (mm)/% in heading not in body of table

Container	Salt concentration %	Firmness and texture	Length before mm	Length after mm
A	40	Very soft, flaccid	20	17
B	20	Soft but firmer than A	20	19
C	10	Firm	20	20
D	5	Firmer than C	20	22
E	2,5	Very firm	20	23
F	0	Very firm	20	24

Concentrations shown correctly (8)

Description of firmness and texture are clear and show degrees of change.

19. Different salt concentrations. (2)

20. Change in length of potato cylinder and or firmness change. (2)

21. Type of potato – all cylinders taken from same potato.
Size of potato cylinder – cut same diameter and length.
Temperature of salt solution – keep the same. (4)

22. Refer to the candidates' own findings when marking.

Mention of firmness/turgidity as a result of water moving in.

Mention of lack of firmness/flaccid nature as a result of water moving out.

Mention no change (length in particular but could also mention appearance) so water potential matches the water potential in the potato vacuoles. (4)

23. Heading: Bar graph to show the initial and final lengths of cylinders A, C and F when placed in different salt concentrations (%).

Y axis: length in mm.

X axis: Cylinder letter or Salt concentration %.

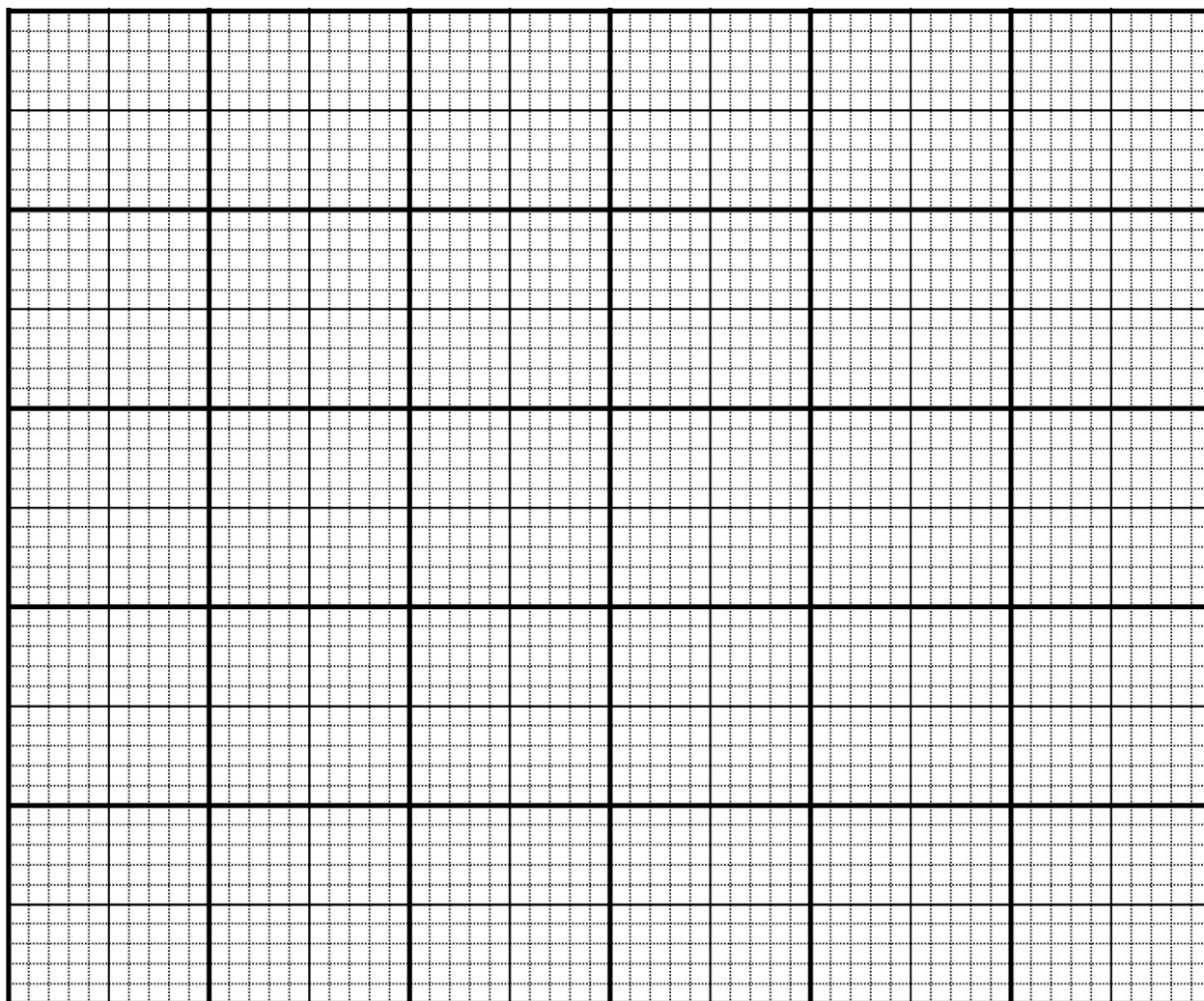
Scale on y axis correct.

Bars for A, C and F (two stacked alongside touching before and after).

Key for before and after.

Space between bars of A, C and F.

Accuracy looking at values from own table.



(10)

24. Quantitative actual values are plotted. (2)
25. Repeat (1)

PART 2 EXPERIMENTAL DESIGN

- 1.1 The greater the surface area of a given length of potato cylinder the greater the change of length will be when placed in a solution of the same salt concentration. Statement. (3)
- 1.2 To investigate the effect of the surface area on the length of two potato cylinders of equal length when placed in a solution of salt. (2)
- 1.3 Method
One way candidates could answer.
- (1) Cut three cylinders of potato using the large or wide cork borer from a potato.
 - (2) Using a sharp knife cut the lengths of these cylinders to measure 20 mm on a chopping board.
 - (3) Using a narrow cork borer cut three cylinders of potato.
 - (4) Using a sharp knife cut the lengths of these cylinders to measure 20 mm on a chopping board.
 - (5) Take three different salt solutions, e.g. 40%, 20% and 0% and place 50 ml in each of the three cups marked A, B and C.
 - (6) Into each cup place one narrow and one wide potato cylinder.
 - (7) Wait 30 minutes.
 - (8) Remove the cylinders from the salt solutions and measure the new **lengths**.
 - (9) Record these final lengths in a table.
 - (10) Calculate the changes in length.
 - (11) Repeat the investigation. (8)

Use the attached rubric for assessment for Question 1.3.

Method Rubric Criteria	5	4	3	2	1	0
L Layout – appearance of method					Layout meets criteria below: neat and tidy and bulleted/numbered.	Layout is untidy and hard to read. OR Method is not formatted correctly with bullet points or numbers.
A Aim – Method relates to prescribed experiment.				Method clearly tests an aim that relates to the prescribed experiment and achieves the required result.	Method relates to the prescribed aim given, but is a little confusing and does not achieve the required result.	Method does not relate to the prescribed aim or achieve the desired result. Method given is the same as the given experiment.
M Method – This needs to be appropriate and relevant to the aim, clearly logical and sequential. If apparatus is given in the examination paper, the method should resemble the one given in the marking guidelines.	All 5 criteria given below are met: 1. An original experiment provided. 2. Equipment is appropriate and used correctly. 3. Measuring of solutions, reagents and marking of equipment are explained and this assists in the control of variables. 4. Instructions are scientifically valid and ordered. 5. Instructions are complete to produce measurable results that are recorded.	An original experiment provided. Plus 3 of 5 criteria are met.	An original experiment provided. Plus 2 of 5 criteria are met.	An original experiment provided. Plus 1 of 5 criteria is met.	An original experiment provided.	None of the 5 criteria are met. OR Method a copy of the original, given experiment.

(8)

Total: 50 marks