NATIONAL SENIOR CERTIFICATE EXAMINATION
NOVEMBER 2018

LIFE SCIENCES: PAPER III

INSTRUCTIONS TO TEACHERS AND LABORATORY TECHNICIANS

IT IS IMPORTANT THAT TEACHERS READ THROUGH **THIS ENTIRE SET** OF INSTRUCTIONS CAREFULLY, WELL AHEAD OF THE EXAMINATION.

This examination begins at 10:00 on 18 September 2018. It is essential that all workstations and equipment are tested and ready ahead of candidates entering the venue.

This is an open-ended practical, and as such, results can be HIGHLY variable from one school to another and also from one candidate to another. There is no CORRECT result for this investigation. It is imperative that candidates write up and discuss EXACTLY the results they get. They MUST NOT try to guess the result and make their data "fit" the expected result.

- Do **NOT** share any of this information with your candidates. It is considered an irregularity, if you do.
- Do **NOT** open the examination packs before the day that the examination is to be written.
- Do **NOT** try the experiments out first or adjust any of the instructions or volumes/ amounts of chemicals.

You may **NOT** run successive sessions in order to accommodate all the candidates on an individual basis. This examination must run at the same time for **all** candidates. It is designed so that it can be carried out in any venue and MUST BE invigilated by staff members who **do not have a Life Sciences background**. Invigilators are to be carefully briefed before the examination on how to complete the grid for procedural and manipulative skills.

SPECIAL ATTENTION IS DRAWN TO THE INSTRUCTIONS (AT THE END OF THIS DOCUMENT) TO BE GIVEN TO INVIGILATORS SO THAT THEY CAN PERFORM THEIR DUTY ON THE DAY.

The following equipment is to be laid out for EACH candidate at each individual workstation.

This must be done by the morning of 18 September 2018 so that the venue(s) is/are completely ready for the candidates.

The security bag containing the scripts will be opened by the chief invigilator 45 minutes before the commencement of the examination. This will give the Life Sciences teacher enough time to prepare the invigilator(s).

- Four identical test tubes in a test tube rack
- Solution A (75 ml) in a beaker labelled "Solution A"
- Solution B (20 ml) in a dropper bottle labelled "Solution B" (can be shared)
- Pipette or dropper
- 5 ml syringe
- 20 ml syringe
- 50 ml of Sample J in a beaker or cup labelled "Sample J"
- 50 ml of Sample K in a beaker or cup labelled "Sample K"
- 50 ml of Sample L in a beaker or cup labelled "Sample L"
- 50 ml of distilled water in a beaker or cup labelled "Distilled Water"
- Polystyrene cup or beaker containing 100 ml tap water for rinsing labelled "Rinsing Water"
- Glass rod or kebab stick for stirring
- Paper towel
- Permanent marker
- Sheet of A4 plain white paper

NOTES ABOUT THE APPARATUS AND MATERIALS

The items listed below are to be set out for **each** candidate at a dedicated workstation.

Test tube rack – make sure that the test tubes fit properly in the holes. If you do not have a sufficient amount, a large beaker or other container which will be able to support the test tubes may be used.

Test tubes – four identical test tubes. Must each be able to hold 40 ml of liquid.

Solution A:

To be made fresh the day before the practical

Concentrated Starch solution made as follows:

- In a beaker place a tablespoon of corn starch.
- Add 2 tablespoons of distilled water and mix to form a smooth paste.
- Add 250 ml distilled water to the paste.
- Heat over a Bunsen burner/stove/hot plate while stirring.
- The starch solution will become clearer just before boiling point. Remove from heat just before the solution boils and is still liquid.
- Note: this concentrated starch solution will be sufficient for 100 candidates.

To dilute (for each candidate) in a separate beaker:

- Immediately add 25 ml of the concentrated starch solution you have just made to 975 ml distilled water.
- Stir the solution (the solution may be cloudy and form a precipitate – this is normal).
- Note: each candidate must receive 75 ml Solution A in a beaker labelled Solution A.

Solution B:

To make a 2% Iodine Solution:

- Purchase 0,1 N (equivalent to 0,5 M) Iodine Solution (equivalent to 20% Iodine Solution) from your chemical supplier.
- Dilute this as follows: 10 ml Iodine Solution in 100 ml distilled water. This will be sufficient for 50 candidates.
- Place in a dropper bottle/small vial/similar container labelled "Solution B".
- Each candidate will use approximately 2 ml Solution B, so dropper bottles can be shared.

Pipette or dropper – each candidate must have a pipette or dropper for use with Solution B.

5 ml and 20 ml syringes – these can be obtained cheaply from your local pharmacy or chemical supplier. Have some spares available in case some are problematic. Each candidate must have a 5 ml and 20 ml syringe.

50 ml of distilled water in a beaker or cup labelled "distilled water". Each candidate requires 50 ml distilled water.

100 ml tap water – 100 ml of tap water in a cup or beaker clearly marked "rinsing water".

Candidates should also have access to other water which can be used to clean apparatus. This could be in a large beaker, basin or laboratory sink.

Glass rod or kebab stick for stirring.

Paper towel – have spare towels available in the venue.

Sheet of A4 plain white paper

Permanent marker – any brand of marker. The candidate may be asked to bring their own.

Technician to make up Samples J, K and L a day before the practical.

Lemon Juice required – any brand of bottled lemon juice available at your local supermarket.

Maizena or corn flour or corn starch required – available at your local supermarket.

Small bag of potting soil or soil/sand from the garden – available at your local nursery/garden centre or any sand/soil from the garden.

Sample J (sufficient for 10 candidates):

In a large beaker add 500 ml tap water.

Add one teaspoon soil.

Stir well.

Let the solution stand for 30 minutes and decant liquid portion into a beaker or cup labelled "Sample J". A bit of cloudiness or precipitate is not problematic. Filtration is not required.

Each candidate requires 50 ml of Sample J in a beaker or cup labelled "Sample J".

Sample K (sufficient for 10 candidates):

In a large beaker add 500 ml tap water.

Add one teaspoon soil.

Add 2,5 ml lemon juice.

Stir well.

Let the solution stand for 30 minutes and decant liquid portion into a beaker or cup labelled "Sample K". A bit of cloudiness or precipitate is not problematic. Filtration is not required.

Each candidate requires 50 ml of Sample K in a beaker or cup labelled "Sample K".

Sample L (sufficient for 10 candidates):

In a large beaker add 450 ml tap water.

Add one teaspoon soil.

Add 50 ml lemon juice.

Stir well.

Let the solution stand for 30 minutes and decant liquid portion into a beaker or cup labelled "Sample L". A bit of cloudiness or precipitate is not problematic. Filtration is not required.

Each candidate requires 50 ml of Sample L in a beaker or cup labelled "Sample L".

Storage: Samples J, K and L can be left covered in the refrigerator overnight and taken out at least an hour before the start of the examination. All other solutions can be left at room temperature until the start of the examination.

GENERAL INSTRUCTIONS

Candidates must supply their own pen, sharp HB pencil, metric ruler, eraser and calculator.

Several skills are to be assessed during this examination. The observations to be marked by invigilator(s) must be discussed between the invigilator(s) and the Life Sciences teacher in the 45 minutes **before** the examination commences. The venue/s must be fully prepared by this time.

Attached is a suitable grid which can be photocopied and used on clipboards by the invigilator(s) during the examination. Make sure that sufficient copies of the grid are made for each venue before the examination commences.

The information contained in these grids **MUST** be transposed by the invigilator (in blue or black pen) to the front cover of EACH candidate's script after the completion of the examination. This needs to be checked by the Chief Invigilator at the school, not only by the invigilator(s).

If a script does not have the marks written on the front cover of the examination, the candidate will lose these assessment marks.

The completed original grids MUST be sent back to the IEB in an envelope, together with the completed scripts.

There must be no candidate names, names of schools or red pen marks on any of the scripts.

The completed scripts must be arranged in the examination number order (in packs of 20). Absentees must be clearly recorded on the forms supplied.

Invigilators are asked to please transfer this after the examination onto the front of the script in blue or black pen.

EXAMINATION NUMBER:		
CRITERIA		
Following instructions	0	1
Procedural skills	0	1
Manipulative skills	0	1
TOTAL		**(3)**

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CRITERIA		
Following instructions	0	1
Procedural skills	0	1
Manipulative skills	0	1
TOTAL		**(3)**

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TOTAL		**(3)**

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CRITERIA		
Following instructions	0	1
Procedural skills	0	1
Manipulative skills	0	1
TOTAL		**(3)**

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CRITERIA		
Following instructions	0	1
Procedural skills	0	1
Manipulative skills	0	1
TOTAL		**(3)**

An alternate method

Invigilators are asked to please transfer this after the examination onto the front of the script in blue or black pen.

EXAMINATION NUMBER	**Following instructions (1)**	**Procedural skills (1)**	**Manipulative skills (1)**	**Total (max 3)**