NATIONAL SENIOR CERTIFICATE EXAMINATION
NOVEMBER 2017

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.

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PART 1 INVESTIGATION

1.14 Suitable heading.
Columns correct with a column for Before and a column for After heating.
Three samples plus water shown.
Results given correctly for D – blue colour for before and after.

1.15 Samples of urine provided.

1.16 Colour change when indicator added **or** amount of glucose present.

1.17 Control, to compare results of investigation samples against.

1.18 Same volume of sample in each test tube – 20 ml in each measured. Amount of indicator added the same – 3 ml added to each test tube. All heated at the same temperature in water/boiling water bath.
Time in the water bath the same – 1 to 2 minutes **for all** to be in the water bath.

1.19 Tube A – (colour change to green/light orange) – glucose is present – possibly diabetic.
Tube B – (colour change to bright orange) – lots of glucose is present – diabetic.
Tube C – (very slight colour change to green/yellow) – small amount of glucose is present – may have had a high carb meal.
Tube D – (no colour change) – is pure water/control so no glucose as indicator stays blue /is not urine.

1.20 Excess glucose build-up/cannot be absorbed by the body cells/kidney and so is excreted into the bladder with urine.

1.21 1.21.1 Tom

1.21.2 330–340 mg/dl

1.21.3 Suzy additional peak shown after lunch.

1.21.4 Quantitative – as numerical values being given.

1.22 magnified length/magnification
= 44 mm /300
= 0,15 mm

PART 2 EXPERIMENTAL DESIGN

2.1 Benedict's solution in the presence of glucose at a concentration of 30 mg/litre will change from blue to a brick red colour. Statement

2.2 To investigate that the only simple sugar that is detected by Benedict's solution is glucose.

2.3 Types of sugar being tested with Benedict's.

2.4
(1) Label four identical test tubes A to D.
(2) Into test tube A, using a syringe, add 20 ml of water.
(3) Into test tube B, using a syringe, add 20 ml of 30 mg/l of glucose.
(4) Into test tube C, using a syringe, add 20 ml of 30 mg/l of sucrose.
(5) Into test tube D, using a syringe, add 20 ml of 30 mg/l of lactose.
(6) Using a syringe add 3 ml of Benedict's solution to each of the four test tubes.
(7) Place all four test tubes into a water bath of boiling water and wait two minutes.
(8) Observe any colour changes in the test tubes.
(9) Record observations in a table.
(10) Repeat the investigation to check for validity/reliability of your result.

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Use the attached rubric for assessment for Question 2.4.

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.

Total: 50 marks

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