



Cambridge Technicals Level 3

Laboratory Skills

05847-05849, 05874 & 05879

Unit 1 Science Fundamentals

OCR Report to Centres June 2018

About this Examiner Report to Centres

This report on the 2018 Summer assessments aims to highlight:

- areas where students were more successful
- main areas where students may need additional support and some reflection
- points of advice for future examinations

It is intended to be constructive and informative and to promote better understanding of the specification content, of the operation of the scheme of assessment and of the application of assessment criteria.

Reports should be read in conjunction with the published question papers and mark schemes for the examination.

The report also includes links and brief information on:

- A reminder of our **post-results services** including **reviews of results**
- Link to **grade boundaries**
- **Further support that you can expect from OCR**, such as our CPD programme

Reviews of results

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Grade boundaries

Grade boundaries for this, and all other assessments, can be found on the [OCR website](#).

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Unit 1 Science Fundamentals

1. General Comments:

The feedback provided by centres in respect of earlier papers was noted and considered in preparation for the current paper. The inclusion of more objective-style items enhanced the accessibility for candidates and enabled them to demonstrate their skills of factual recall and application of knowledge. In addition, candidates were well prepared for a wide range of themes/topics covered within the specification. The final question focussed on learning outcome (LO) 6 and the topic covered was clearly much more familiar to candidates. This was encouraging. However, as for earlier papers, a number of candidates struggled with items relating to cell and tissue structure and function. Many candidates were able to respond to all questions in the time available, and relatively few did not attempt to answer the questions. The additional page was rarely used by candidates.

2. Comments on Individual Questions:

1(a) The majority of candidates were able to correctly identify the number of protons, electrons and neutrons for potassium. The most common error was the assumption that the neutron number was 39, rather than 20.

1(b)(i)(ii) Almost all candidates were able to select the correct group and period for potassium within the periodic table. No pattern was noted for alternative responses.

1(c)(i) Some candidates cope well with this item and successfully calculated the nuclear radius of a potassium atom. Some were unable to include $39^{1/3}$ within their calculations.

1(c)(ii) This item presented some difficulty for a number of candidates. It seemed that the features of strong nuclear force and the attraction between protons and neutrons were not fully appreciated. Some included references to gravitational forces out of context.

1(c)(iii) This item also was challenging for many candidates. The key features expected included the greater increase in proton numbers and the greater attraction from the nucleus to the electrons. Common responses referring to the numbers of electron shells failed to achieve the marking points.

1(d) The majority of candidates recognised that isotopes have different number of neutrons. No clear pattern of alternative responses was apparent.

2(a)(i) Candidates were familiar with the symbols for hydrochloric acid and sodium chloride. The addition of numbers, in an attempt to balance the equation, was not credited.

2(a)(ii) Most candidates correctly retained the left hand side of the nitrosamine structure but were unable to complete the –N-NO property.

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2(a)(iii) This question was answered well by most candidates. Candidates were able to list options such as reduction, addition and polymerisation. Common errors included condensation.

2(b) Candidates struggled with this question with very few candidates successfully reconstructing the oxidation of ascorbic acid. The loss of the double bond between the carbon atoms and the removal of H ions generally were not considered. A wide range of incorrect, alternative responses was observed.

2(c)(i) Some candidates obtained full marks for recognising the features of the four factors listed, affecting the rate of reactions. However, many responses displayed correct links only for solvent and enzyme.

2(c)(ii) Candidates answered this question well. They readily listed two other factors known to affect the rate of reactions, ranging from temperature and light intensity to concentration and physical state.

3(a)(i) The image shown in Fig.3.1 showed a number of nuclei. Muscle cells/fibres are multinucleate. Many candidates considered that these organelles were mitochondria. The identification of label A as the plasma membrane was demonstrated by most candidates. A few incorrectly identified this feature as the cell wall, which is not present in animal cells.

3(a)(ii) It was encouraging to see the successful attempts at drawing the Golgi apparatus and the lysosome. Most were able to recall that lysosomes are simple, spherical organelles but struggled to show the features of the Golgi body. No clear pattern of alternative responses was identified.

3(a)(iii) This question was answered well. Most candidates were aware that the ribosome is the site of protein synthesis. A few candidates incorrectly identified the process of respiration.

3(b)(i) Most candidates correctly identified the function of the mitochondrion as (cellular) respiration. Some referred to aerobic respiration and others to ATP production. References to the 'production of energy' negated this marking point. Many linked the correct response to the use of energy for the contraction of muscle cells.

3(b)(ii) This question on the topic of sarcoplasmic reticulum was not answered well. The role and context of this structure is linked to the movement/storage of calcium ions to enable the muscle cells to contract or, more specifically, to the sliding of muscle fibrils within the cells.

3(c)(i) Most candidates realised that the connective tissue binds the bundles of muscle fibres together and/or gives support. This feature was expressed in number of different ways but the key role was apparent.

3(c)(ii) For this question, it was pleasing to see candidates successfully comparing the features of the two images of normal and diseased muscle tissues. The image for diseased muscle was challenging to interpret but this did not affect the accreditation of relevant marking points. Most correct responses focussed on the shapes of muscle fibre bundles and the depth of connective tissue/endomysium.

3(c)(iii) Many candidates were able to recognise the components of connective tissue to include collagen, elastic fibres and matrix. Incorrect responses included blood plasma and gametes.

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4(a)(i) Ketone was the correct response for the type of compound. This was identified by most candidates but a few incorrectly considered that the molecule was an ester.

4(a)(ii) The majority of candidates identified C=O as the functional group in heptan-2-one.

4(a)(iii) It was encouraging to note that most candidates recalled that two other forms of isomer are structural and geometric. A clear pattern of alternative responses could not be identified.

4(a)(iv) Many candidates were aware that features of isomers included the similarity of molecular formulae with a different arrangement of atoms.

4(b) Table 4.1 enabled candidates to demonstrate their level of recall for functional groups. Most were successful and listed four or five of the groups. However, some considered that the ester (for isoamyl acetate) was a carboxylic acid.

4(c)(i) Many candidates struggled to recognise the ester bond in the triglyceride shown in Fig. 4.2. No clear pattern of alternative responses was identified.

4(c)(ii) Most candidates named the molecule as a phospholipid but some ticked the sterol lipid option.

5(a) The biological functions of the metal ions listed in Table 5.1 are seen within the specification. Many candidates struggled with this question. A few obtained full marks but others were unable to make the correct links.

5(b) The objective format within the table enabled many candidates to draw the correct conclusions about the true or false statements. The candidates are familiar with this format.

5(c) Most sentences were completed successfully by many candidates in this question. However, some candidates incorrectly considered that peroxides are produced as a result of the metabolism of carbohydrates. The liver was correctly recalled as the site for the break down of peroxides.

5(d) A wide range of descriptions was accredited for this open-response question. However, it was not possible to give marks for repeat statements for the same feature shown in Table 5.2. The downward trend was correctly noted by most. However, the 20 deaths linked to the period 1953 – 1992 was often incorrectly seen to be an increase but this was not the case because the period was much longer than others listed.

6 Some candidates did very well with this free response (level of response) question and functioned at level 3, obtaining 5 or 6 marks out of 6. Others were more challenged with this topic and failed to compare the crosslinking shown in method 1 with the addition of plasticising agents shown in method 2. Some candidates were aware of the outcome of the two methods in relation to differences in strength but other features were not considered fully.

7(a)(i) It was most encouraging to see that, with the appropriate scaffolding provided within this question, many candidates were able to successfully complete the calculation. The units were already provided so they was not an issue in this question No clear pattern of errors was identified.

7(a)(ii) Many candidates answered this question well. The provision of the equation enabled many candidates to achieve a correct value for power. However, some failed to obtain the mark for the units since they referred to joules (J) rather than joules per second.

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7(b) Some candidates obtained full marks for this question. Others were able to rearrange the equation for the calculation but struggled to obtain the correct answer due to the inclusion of incorrect values. Others failed to express the answer to two decimal places.

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