

**Additional Applied Science A
Twenty First Century**

General Certificate of Secondary Education **GCSE J632**

Report on the Components

June 2007

J632/MS/R/07

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This report on the Examination provides information on the performance of candidates which it is hoped will be useful to teachers in their preparation of candidates for future examinations. It is intended to be constructive and informative and to promote better understanding of the syllabus 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.

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A324/01 Life Care – Foundation Tier

General Comments

Overall this was a very fair paper with no suggestion that the candidates had been under any time pressure and no signs that any group had been disadvantaged by the language or any cultural issues. A minority of candidates scored almost full marks, and everyone was able to find something that they were able to tackle.

Comments on Individual Questions

- 1 Part (a) was generally well answered with the majority of candidates scoring at least 2 of the 3 marks. A few failed to score (ii) because they simply repeated the stem of the question, that the restaurant was hot.

In part (b)(i) most of the candidates correctly labelled the diagram of the respiratory system, although a few labelled the diaphragm as the intercostal muscles and some confused the trachea and bronchial tubes. Part (b)(ii) produced some very good answers with reference to gas exchange, the connection between a lack of oxygen and the cessation of respiration, and the possibilities of ensuing death. A few weaker candidates failed to score either mark in this section because they just repeated the question stem and said that Joe was choking.

- 2 The majority of candidates correctly identified the three pieces of information the nurse would need to ask about, with only a few of the lower attaining candidates falling for the marital status distracter.

Far more candidates were distracted in (b)(i) by the box labelled cancer. The most able candidates scored all three marks, but many others picked up one mark for diabetes and glucose, but drew lines at random to the other conditions. Part (b)(ii) produced very good responses from some centres, where the students were obviously familiar with the technique. However, centres need to remind their candidates that they will be heavily penalised for the incorrect use of medical terminology. Likewise, vague references to 'cleaning' the area before taking the sample were not credited. The best answers referred to using an antiseptic and even use of a disinfectant was accepted. In (b)(iii) some candidates easily identified the red and white blood cells, whereas other candidates were totally confused and either left the question blank or even labelled a lobe of the nucleus as a red blood cell.

- 3 The first part of this question was quite poorly answered. The better candidates were able to suggest illness and injury as the two most likely reasons for an unexpected change in training programme. However, a lot of candidates missed the 'unexpected' part of the question and talked about Jaimie deciding to change event, concentrate on another group of muscles or needing to change the programme because it was boring. A few even offered a dental appointment or a heavy night out as alternative suggestions.

Part (b) was generally much higher scoring with most candidates showing evidence of a calculator and scoring most of the available marks.

Report on the Components taken in June 2007

- 4 In part (a) the five qualities were selected by most candidates, with just a few opting for good teeth or good looking instead of tactful.

Part (b) elicited a range of possible health practitioners. Most were accepted, although surgeons, paramedics and cleaners were not deemed to be appropriate health practitioners for a community health centre. Nurses were similarly disallowed because the question required one other example. The final part of this question served to discriminate between candidates. A good answer suggested a possible change in life style, such as drinking less alcohol, and then linked that to a specific health problem, such as, reducing the chances of liver damage. Weaker candidates referred to the need to 'stop drinking' and failed to link it to a health problem. A number seemed to confuse kidney and liver, with too much alcohol resulting in kidney cancer or damage. Once again, a number of candidates did not read the question carefully enough and referred to smoking and the health benefits that arise from no longer smoking.

A324/02 Life Care – Higher Tier

General Comments

The overall performance of the candidates was good. There was no evidence of any candidates having insufficient time to complete the paper. Generally speaking, the candidates were able to demonstrate a good understanding of health care provision, with the more able individuals showing good data handling and comprehension skills. However, a considerable number lost marks through failing to read the questions carefully enough.

Comments on Individual Questions

- 1 There were a surprising number of candidates who did not notice the 'unexpectedly' prompt in the question stem of part (a). Consequently their suggestions ranged from the tedium of the routine through to Jaimie deciding to change event. More carefully considered answers included changes due to injury or illness, or very rarely because of Jaimie's unexpectedly rapid progression.

In part (b) most candidates were able to calculate the correct answer and scored all the available marks. It was pleasing to see that centres have advised candidates to have a calculator with them. The majority were able to use their calculated answer or the diagram of the muscle fibre distribution to work out the best event for Jaimie in (iii).

- 2 Most candidates were able to score full marks for (a)(i), although a few were distracted by the inclusion of cancer. Part (ii) was not very well answered by most candidates. Answers were too vague, with incorrect terminology, and a surprising number focussed on how the blood sample was processed once the sample had been collected. However, (iii) was generally well answered with the majority of candidates able to distinguish between red and white blood cells.

Question (b) was very centre dependent, with a large proportion of candidates able to offer the ECG. However, some clearly had no idea and were left offering worrying suggestions, such as the step or bleep test.

- 3 The majority of candidates scored at least one of the available marks in (a)(i), although a minority merely repeated the stem of the question about a nurse needing to be an effective communicator, without appreciating the need to explain why this was necessary. Only the better candidates appreciated the need to give two distinct reasons. In part (ii) most candidates were able to suggest two qualities a nurse should have, although the lower attaining candidates often gave effective communicator instead of suggesting a different quality.

The majority of candidates were able to suggest an appropriate health practitioner in part (b)(i), although a few did not read the question carefully enough and used a nurse as their example. Most suggestions were accepted, although paramedics, surgeons and cleaners were not deemed to be appropriate health practitioners for a community health centre. There were a large number of vague and woolly answers in (ii) about the need to know whether you are ill or not. Only the most able candidates appreciated the significance of public health information and were able to answer in terms of anti-smoking campaigns or safe sex and the reduction in number of cases of Chlamydia. Very few of these were able to score all three marks because they could not extend the example or link it to saving money or resources.

Report on the Components taken in June 2007

- 4 In part (a)(i) most candidates realised that the scan was to check on the development of the baby and a few related it to establishing the gender. Question (ii) provoked a mixed response. Most candidates scored the mark for appreciating that ultrasound was safe or X-rays could harm the baby. However, very few were able to expand on this to score the second mark. There were also a worrying few who thought that ultrasound enabled one to hear the baby!

In part (b)(i) most candidates associated the use of ultrasound with the need to avoid inadvertently poking the baby; although there was evidence that some did not use the information given and therefore thought that the ultrasound was used to guide the needle into the baby. Answers to (b)(ii) were generally very good with most appreciating that the test could be potentially damaging to the baby or Jasmine. Very few offered the idea that all procedures carry some sort of risk.

Not many candidates scored all three of the available marks in (c)(i). Only the very best were able to provide an appropriate scale and candidates from a number of centres merely copied the numbers onto the axes to give a straight line graph. Centres should instruct their candidates on how to construct graphs, as well as how to interpret them. In part (ii), most candidates appreciated that Jasmine must have been considerably younger and therefore at less risk. Some even worked out her potential age and risk factor. Only a few candidates ignored the information provided and they suggested that the test was not available when she had her first children.

A325/01 Scientific Detection – Foundation Tier

General Comments

The paper was constructed in two parts, with questions 3 and 6 being common with the Higher Tier paper.

Most candidates performed quite well. It was clear that many had been well prepared for the examination and managed to complete all of the questions in the time allowed.

Comments on Individual Questions

- 1 This question was an easy start to the paper and was intended to give candidates confidence in what for many was a new style of questioning. In part (a) most candidates performed well gaining all three of the marks available. However, candidates should know that if they attempt to hedge their bets and draw two lines to or from, one of the boxes, they will score no marks even though one of the two lines may be correct.

Part (b) was marked such that any answer that indicated that data was collected or analysed from a crime scene was credited. Those candidates who simply stated “collect finger prints” gained the mark.

- 2 Part (a) tended to be very centre specific. Most candidates scored the first two marks but candidates from some centres did not score the second two marks. Credit was given for stating that the hole in the stage allowed light to pass through, and the eyepiece lens magnified the specimen that was being examined. Those candidates, who simply stated that the eyepiece was to look through, did not score.

Part (b) was marked leniently and credit was given for stating that both samples contained large and small grains and that they appeared the same in both specimens. This resulted in most candidates scoring both available marks.

- 3 This question was an overlap question with the Higher Tier paper and intended to target C and D grade candidates. Part (a) was new to the specification and candidates did not perform well. Many ignored the clue in the name of the microscope and instead drew rings around the nucleus or one of the particles within the nucleus, with names for the particle ranging from nucleus, atom and even molecule. As centres come to terms with the new specification it is likely that responses to this section will improve in subsequent years.

Surprisingly the quality of answers to part (b) were very varied. Many candidates measured the diameter of the pollen grain by ignoring the spikes and consequently did not score. Others struggled with dividing the diameter they obtained by 0.05 to determine the magnification. Candidates who used the correct method but achieved an incorrect answer were credited with one mark and those candidates who incorrectly measured the diameter of the pollen grain were credited with both calculation marks if their method and calculation was correct.

Part (c) was looking for specific physical differences between the two types of microscope. The advantages and disadvantages of each were credited elsewhere on the paper. Good answers included using light or electrons, less and higher magnification and needs and does not need a vacuum. However in order to score these marks a direct comparison of each point had to be made. Simply stating that an electron microscope had a high magnification did not score.

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- 4 This question was generally well answered. In part (a) most candidates managed to name an indicator, but a common error was to use a pH meter and this was not credited. Marks for parts (ii) and (iii) were awarded based on the answers to part (i) and those candidates who gave the correct colours, but the wrong way round, were awarded one of the two colour marks.

Part (b) was a data interpretation exercise with most candidates performing well. However, weaker candidates tended to struggle and simply gained serendipitous marks by guessing the correct responses.

- 5 The quality of responses to this question depended on whether the candidates had read the question carefully. All the correct answers were available and candidates simply had to select the correct response for each question. Those candidates that did this scored at least three of the five marks. Those candidates that did not read the question and decided to write their own responses did not fare so well, scoring far fewer marks. Candidates are continually reminded that they should read the question carefully. They would be well advised to do this. The most common error was in part (d) where candidates used the distracter “to see into the tank” as a reason for explaining why it was covered.

- 6 This question was an overlap question with the higher tier paper and intended to target C and D grade candidates. For many candidates it proved to be a difficult question. To increase the facility candidates were credited for giving the same argument in reverse for parts (a) and (b), for example those candidates who stated that a light microscope produced coloured images and an electron microscope black and white, scored two marks. Other creditable answers included a light microscope could view living organisms but had limited magnification while an electron microscope had much higher magnification but could not view living organisms.

Part (c) was not done well. Simply stating that it was an easy test to carry out but was limited to testing colours or was not quantitative scored both marks. However, it was clear that most candidates had not previously considered the advantages and disadvantages of using such a method.

A325/02 Scientific Detection – Higher Tier

General Comments

The paper was constructed in two parts, with questions 3 and 6 being common with the Higher Tier paper.

Most candidates performed quite well. It was clear that many had been well prepared for the examination and managed to complete all of the questions in the time allowed.

Comments on Individual Questions

- 1 This question was intended as an easy start to the paper, to give candidates confidence in what for many was a new style of questioning. However, few managed to score full marks. Part (a) should have been a simple memory exercise but it was clear that some candidates had failed to learn the definition of a proficiency test. Some simply guessed the answers and a few did not read the question and gave one response instead of two. Candidates would be well advised to read questions most carefully before attempting them.

Part (b) was answered well by most candidates. Good answers included staff training, Health & Safety and checking equipment.

- 2 Question two was answered well by more able candidates and discriminated well between candidates of differing abilities. In part (a) each section was worth two marks, one for correctly identify the image and a second for a good explanation. Weaker candidates often gained the first but not the second mark. Part (i) required candidates to identify image B and state that it showed the most detail or had the greatest resolution. Part (ii) required candidates to identify image A and state that the whole image was in focus, and part (iii) required candidates to identify image D and state that it was the largest size.

Part (b) was not well answered. Surprisingly, it was not the most able candidates who managed to occasionally score one of the two marks. Credit was given to those candidates who realised that the photograph on the printed page could be larger or smaller than the image viewed through the microscope.

Part (c) was well answered with most candidates correctly determining that the magnification was $\times 1000$. A few candidates failed to score because they added the two figures of 40 and 25 together, rather than multiplying them.

- 3 This question was an overlap question with the Foundation Tier paper and intended to target C and D grade candidates. Part (a) was new to the specification and some candidates did not perform well. A few ignored the clue in the name of the microscope and instead drew rings around the nucleus or one of the particles within the nucleus, with names for the particle ranging from nucleus, atom and even molecule. As centres come to terms with the new specification it is likely that responses to this section will improve in subsequent years.

Surprisingly, the quality of answers to part (b) were very varied. Some candidates measured the diameter of the pollen grain by ignoring the spikes and consequently did not score. Others struggled with dividing the diameter they obtained by 0.05 to determine the magnification. Candidates who used the correct method but achieved an incorrect answer were credited with one mark and those candidates who incorrectly measured the diameter of the pollen grain were credited with both calculation marks if their method and calculation was correct.

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Part (c) was looking for specific physical differences between the two types of microscope. The advantages and disadvantages of each were credited elsewhere on the paper. Good answers included using light or electrons, less and higher magnification and needs and does not need a vacuum. However, in order to score these marks a direct comparison of each point had to be made. Simply stating that an electron microscope had a high magnification, did not score.

- 4 This question was done well by those candidates who had been given practice in drawing graphs. Part (a) was not well done. Good answers included setting to zero or calibrating the device. Common errors included using water because its ph was neutral.

In part (b) able candidates scored all three marks. Marks were awarded for drawing axes with correct labels and scale, all plots drawn correctly and finally drawing a line of best fit that also went through the origin. Too many candidates still do not know which way round the axes should go and use inappropriate scales. Candidates would be well advised that questions will always allow simple, appropriate scales to be used for all axes. For part (ii) any error was carried forward so that candidates that plotted the graph incorrectly were not penalised again for an incorrect reading from the graph. Many candidates failed to follow instructions by not drawing horizontal and vertical lines on their graphs.

- 5 This question was similar to a foundation tier question but correct responses were not supplied. Most candidates made a creditable attempt to answer this question and because they were not provided with the distracter written on the lower tier paper, did surprisingly well scoring two, three or four of the marks available. A question of this type always appears on the Higher Tier paper and Higher Tier candidates would be well advised to do their revision of question papers by looking at the correct responses available on the foundation tier paper.

- 6 This question was an overlap question with the foundation tier paper and intended to target C and D grade candidates. For some candidates it proved to be a difficult question. To increase the facility candidates were credited for giving the same argument in reverse for parts (a) and (b), for example those candidates who stated that a light microscope produced coloured images and an electron microscope black and white, scored two marks. Other creditable answers included a light microscope could view living organisms but had limited magnification while an electron microscope had much higher magnification but could not view living organisms.

Part (c) was not done well. Simply stating that it was an easy test to carry out but was limited to testing colours or was not quantitative scored both marks. However, it was clear that most candidates had not previously considered the advantages and disadvantages of using such a method.

A336/01 Materials and Performance – Foundation Tier

General Comments

In general, candidates had been well prepared for the examination and had been entered appropriately. The most able entrants appeared to be challenged by the harder questions, with few very high scores.

Where candidates were asked to apply their understanding in an unfamiliar context, almost all made sensible suggestions although, these suggestions may not have been at the level needed to earn a mark. Improvements could be made in learning specified vocabulary and facts.

Teaching points

- Learning homework would help with essential vocabulary from the specification.
- Practice in writing descriptions would prepare for describing their own examples, as listed in the specification.
- Practice in drawing and labelling diagrams would help descriptions and explanations.

Comments on Individual Questions

- (a) The very great majority of candidates correctly selected suitable properties for the items illustrated.
 - (b) Many candidates obtained all 3 marks, but weaker candidates were uncertain as to which materials were electrical conductors and which were electrical insulators.
 - (c) Most candidates answered well but some struggled to match the materials with their classes.
- (a) Almost all candidates described a mirror as reflective. Most candidates described a use of a mirror in buildings or amusements in part (ii); but some described its use for cosmetics and some described 'bending' a mirror rather than how it could be used.
 - (b) Stronger candidates correctly described the optical properties of the materials but many described the metal battery box as tough rather than opaque.
 - (c) Most candidates correctly selected answers describing the movement of heat energy, but some choices suggested the candidate did not understand this idea.
- (a) Almost all candidates could identify the effect of making vibrations larger.
 - (b) Most candidates sequenced the three sounds in order of loudness but some reversed the order, despite the prompt given within the question.
 - (c) In part (i) very few candidates showed where the ear is most sensitive to sound. Most candidates correctly selected the answer 'His ear is more sensitive at 500 Hz' in part (ii). However, few candidates linked decibels to the intensity of a sound in the final part of the question.
- (a) To give maximum rigidity to this gate, the beam should be fastened diagonally and onto its uprights, but few candidates made this clear. Many sketches were too careless and thus lost marks.
 - (b) Although some answers correctly showed both tension and compression, many answers showed 2 descriptions of compression, one with arrows vertically and the other with arrows horizontally.

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- (c) Part (i) of this question required candidates to apply their knowledge of the structure of a composite material. Some correctly described the arrangement of the fibres. In part (ii) the quality of explanations varied greatly but many candidates struggled to express their ideas. Very few candidates gave the meaning of the word tough in part (iii).
- (d) The points were well plotted and most lines of best fit were acceptable. The majority correctly described the trend in the results and some candidates also indicated the outliers.
- (e) Most candidates described an experiment to investigate a mechanical property, but many of these did not relate to stiffness.

A336/02 Materials and Performance – Higher Tier

General Comments

Candidates appeared to have been entered correctly for this paper and weaker entrants scored well on the overlap questions. However, many candidates had not developed the higher-level skills needed to analyse and discuss information provided.

It appeared that certain parts of the specification had not been covered by all Centres, resulting in a significant disadvantage for candidates.

Teaching points

- Learning homework would help with essential vocabulary from the specification.
- Practice in writing descriptions would prepare for describing their own examples, as listed in the specification.
- Practice in drawing and labelling diagrams would help descriptions and explanations.
- To prepare for Higher Tier entry give practice in analysing information, writing explanations and written discussions.

Comments on Individual Questions

- (a) To give maximum rigidity to this gate, the beam should be fastened diagonally and onto the uprights, but few candidates made this clear. Many sketches were too careless and thus lost marks.
 - (b) Although some answers correctly showed both tension and compression, many answers showed 2 descriptions of compression, one with arrows vertically and the other with arrows horizontally.
 - (c) Question (c)(i) required candidates to apply their knowledge of the structure of a composite material. Some correctly described the arrangement of the fibres. The quality of explanations varied greatly in part (ii) but many candidates struggled to express their ideas. Very few candidates gave the meaning of the word tough in part (iii).
 - (d) The points were well plotted and most lines of best fit were acceptable. The majority correctly described the trend in the results and some candidates also indicated the outliers.
 - (e) Most candidates described an experiment to investigate a mechanical property, but many of these did not relate to stiffness.
- (a) Candidates varied considerably in their ability to answer this question, which required them to understand the information about each person's needs and then to choose the most suitable material.
 - (b) In part (i) stronger candidates correctly linked the word 'converges' with the action of the lens but many weaker ones selected 'reflects' or 'diverges'. Stronger candidates generally recognised that the image is focused on the retina in (ii), but a few selected 'eye lens'. Many candidates recognised the focal length of the lens in part (iii), but some confused it with the focal plane.

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- 3 (a) In part (i) the stronger candidates were able to select properties which made the aluminium alloy better than cast iron, and could justify their selection. Weaker candidates misidentified the qualities required but almost all candidates made a sensible attempt to justify their choice. Stronger candidates were able to identify the disadvantages of using aluminium in (ii), but weaker ones were unable to analyse the information given and could not distinguish between advantages and disadvantages. Some candidates only gave one disadvantage with a justification, rather than the two required by the question. Almost all candidates correctly identified Sample B as giving the most reliable results in part (iii), and correctly considered the range of its results, but unfortunately many could not be awarded the mark because they did not compare this range with that of the other samples.
- (b) Most candidates calculated the means correctly in (ii), but those without calculators were disadvantaged.
- 4 (a) Very few candidates could describe how to measure conductance and very few marks could be awarded.
- (b) Very few candidates could describe the meaning of refractive index in part (i). In part (ii) most candidates were able to select a correct answer and justify their choice.
- (c) Very few candidates could explain why the glass used for optical fibres must have high transparency.

**General Certificate of Secondary Education
Twenty First Century Additional Applied Science A (J632)
June 2007 Assessment Series**

Unit Threshold Marks

Unit		Maximum Mark	a*	a	b	c	d	e	f	g	u
A324/1	Raw	36	n/a	n/a	n/a	26	22	18	15	12	0
	UMS	34	n/a	n/a	n/a	30	25	20	15	10	0
A324/2	Raw	36	31	26	21	17	13	11	n/a	n/a	n/a
	UMS	50	45	40	35	30	25	20	n/a	n/a	n/a
A325/1	Raw	36	n/a	n/a	n/a	20	15	11	7	3	0
	UMS	34	n/a	n/a	n/a	30	25	20	15	10	0
A325/2	Raw	36	28	22	16	11	8	6	n/a	n/a	n/a
	UMS	50	31	26	21	17	13	11	n/a	n/a	n/a
A336/1	Raw	36	n/a	n/a	n/a	28	24	20	16	12	0
	UMS	34	n/a	n/a	n/a	30	25	20	15	10	0
A336/2	Raw	36	29	24	19	15	12	10	n/a	n/a	n/a
	UMS	50	31	26	21	17	13	11	n/a	n/a	n/a

For a description of how UMS marks are calculated see;

http://www.ocr.org.uk/learners/ums_results.html

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