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General Certificate of Secondary Education
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Human Health and Physiology 44152

(Specification 4415)

Unit 2: Investigations in Human Health and Physiology

Report on the Examination

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Administration

Most centres submitted a complete, well-presented sample for moderation well within the May 7 deadline. All moderators are aware of the time needed to satisfy AQA's instructions regarding the administration of the moderation procedure, and are very grateful that most centres do a very good job in presenting their candidates' work.

A small number of centres did not complete the paperwork as expected. Where this happened the main deficiencies were:

- incomplete or missing Candidate Record Forms
- forgetting to include a signed Centre Declaration Sheet
- entering an incorrect mark on the Centre Mark Sheet.

The moderator team was pleased that the great majority of centres completed the paperwork correctly and in full, and there were very many instances where the moderator benefited from thoughtful work by the centre.

General Comments

More centres attempted ISA 2 compared to ISA 1, probably due to the practical activity in ISA 2 requiring far less equipment and preparation time.

ISA 1: Amylase Action

Question 1

The independent variable was correctly identified by most candidates. However, there were many who did not know what an interval was and often stated the range used.

For example:

1(b) 'time per minute', 'every 20 seconds' or '0-50 °C' were common responses.

1(c) 'because the interval my group worked at was the optimum temperature', '12 minutes gave enough time to record the results' or 'I found out the enzyme worked best at 30 °C' were common responses.

Question 2

Most candidates managed to describe the colour changes, but some got them the wrong way round.

Question 3

Most candidates managed to tick the correct box, but some thought they should tick the box, which included body temperature rather than checking their own results.

Question 4

Why a control is necessary was well answered. For example: 'to test if the enzymes are playing any part in the experiment', 'to compare our results as this one will always stay the same', ' to ensure that the enzyme could be the only significant factor causing the change',

'to ensure that the enzyme is breaking down the starch' or 'to check the enzyme had any effect'.

Some confused the question with 4(b) and described what they did for a control, others gave some vague answers or incorrect ones. For example: 'so only one variable will affect the final result', 'to see what the enzyme does normally', 'to make the experiment more reliable' or 'to make sure it is a fair test'.

Most candidates could describe what they did for a control. For example: 'water was used instead of amylase', 'I substituted the enzyme for water and tested it with iodine', 'we had starch and water' or 'we used boiled amylase at 100 °C'.

Some confused this with fair test ideas or substituted the iodine with water or mentioned the water but with little detail. For example: 'I heated some water till it was 60 °C', 'we measured the amount of water in the beaker, amylase and starch' or 'I used the same amount of solution throughout the experiment'.

Question 5

A lot of discrepancy here between the marks awarded by the centre and the moderators. Too many responses were not actually reliability comments or a mark was awarded for simply stating 'repeat the experiment'.

For example: 'using an electronic thermometer', 'do 5 °C intervals', 'have smaller intervals', 'carry out the experiment with more temperatures', 'use time intervals of 10 sec instead of 30 sec'.

Question 6

Generally good descriptions here, although there were quite a few who felt it necessary to relate this to body temperature and give scientific reasons for their conclusions concerning denaturing etc.

Question 7

Good marks gained here although lines of best-fit need more practice.

Question 8

Almost all candidates scored this mark.

Question 9

Most candidates managed to score two marks here. Popular answers were to use the same amount of blood stain and SO-CLEAN.

Question 10

Identifying the anomaly and calculating the mean posed little problem with only a few of the lower scoring candidates getting this wrong.

Part (c) was challenging for most with only a few of the higher scoring candidates achieving two marks. Most could describe the change with temperature increase for one mark, but could not describe the levelling off effect.

For example: 'the increase in temperature made the enzyme work more efficiently however at extreme high temperatures the enzyme denatures and therefore doesn't work', 'as the temperature increases the more successful collisions increase removing more stains and 40°C is the optimum temperature', 'as the temperature is increased the percentage of light that passes through the cloth is greater. At the highest temperature of 40°C the highest percentage of light passes through'.

Question 11

The majority of candidates scored zero or one mark here with some lower ability candidates not attempting this question.

For example: 'more dirt is removed from AQAWASH than SO-CLEAN', 'there were no anomalies for SO-CLEAN but AQAWASH had an anomaly', 'AQAWASH overall had a better result letting a greater percentage of light through the cloth', 'SO-CLEAN starts off with lower percentages at the starting temperature and AQAWASH ends in a higher percentage at 40°C than SO-CLEAN'.

Question 12

Most candidates ticked the correct box here.

Question 13

A good understanding of the need for a comparison or a control.

Question 14

Saving money or energy were common responses with some realising that there was little point in increasing the temperature above 30 due to the small change in stain removal after this point.

Question 15

This question differentiated between candidates. Grade A candidates were generally able to achieve 4 marks with grade B gaining two or, more commonly, three marks. The lower ability candidates wrote very little here and what they did write was rather muddled showing a lack of understanding of the experiment.

For example: 'use four pieces of cloth and stain each piece with a set amount of bacteria, always use the same amount', 'put AQAWASH and stained cloths in the washing machine using a range of temperatures, check where the stains are to see how much bacteria there is', 'use a few petri dishes each one with a square of washed cloth and incubate them at different temperatures. After removing the squares of cloth they will be able to find out which one works best at removing bacteria'.

ISA 2: Eye to hand co-ordination

Question 1

The independent variable was correctly identified, although a few candidates were confused when they had drawn a line graph showing number of trials against time taken rather than a bar chart of the mean.

The majority of candidates were able to suggest another variable that could have been investigated. There were a number who suggested changing the shape of the template. This was an allowed mark (D - if the centre had awarded it) as it may indeed affect the dependent variable, but its significance in eye to hand co-ordination was questionable.

Question 2

This question was generally well answered with three or two marks being awarded. A mark was lost when the dependent variable was mixed up with the independent and 'categoric' was ringed.

Question 3

In part (a), centres should have checked their candidates' results before awarding marks here as too often the answer did not match the results. For example, the increase in speed at completing the task with more attempts was a pattern and not an anomaly.

For example: With the 'yes' box ticked, 'because the results were drawn in a histogram so there wasn't any', 'the last trials were faster than the first trials' – these responses were not worthy of a mark.

'Someone got a random time in the test' – this response was only awarded a mark if the anomaly was identified, for example by circling the anomaly on their table or chart. Whereas 'because all the results apart from one were under 200 seconds', 'person 5 took a lot longer to complete it', 'trial 6 for the male did not follow a pattern of decreasing time' - were worthy of a mark.

In part (b), many candidates scored a mark here 'by being distracted' or human error comments about the stopwatch.

Part (c) was well answered.

Question 4

It was often difficult to agree the two marks awarded by the centre here. Both answers were commonly from the same marking point or were rather too vague (eg pen, mirror).

For example: 'the size of the star, the angle of the mirror,' 'distance between star and mirror, pen used', 'same size star, same size mirror', 'same equipment, same shape star,' 'same mirror distance, same standing position' were not worth two marks.

Question 5

Generally, candidates scored one mark here with the higher scoring candidates managing to add a quantitative statement for the second mark.

It was also possible to obtain two marks for noticing the trend with repeated trials as well as the trend between left versus right hand for example.

Question 6

As with ISA 1, good quality bar charts and tables were produced. Generally, candidates scored four to six marks here.

Question 7

It was the norm for candidates to gain one mark in this question. The second mark, for a quantitative response, was often missing. Candidates could have gained a mark by either noticing the difference between the two values or reading off and stating what the values were for each bar.

Question 8

In part (a), the number of people scoring/number of physiotherapists used were common responses. Incorrect answers generally focused on the idea that they repeated the experiment.

In part (b), the idea of testing a boy and girl at each age was often poorly stated, for example 'an equal amount of girls should have been used', 'let the girls have more to do with it', 'taking more females'. Often the second mark was lost when candidates thought that the scores should be tested more than once or that they should simply 'repeat the experiment'.

Parts (c) and (d) usually resulted in full marks, but with the lower scoring candidates slipping up on one of the ages in part (d).

Question 9

This question was generally well answered, but with some choosing year 11 instead of 7 in part (a).

Question 10

This posed a challenge to all but a few of the higher scoring candidates, generally a mark of one or two was the norm even for those candidates scoring above thirty. Those scoring 38 to 40 were more likely to score three or four marks here, although it was rare to see a mark of four. Candidates failed to make adequate use of the data and consequently few included any quantitative statements. Many repeated what had already been answered in Question 9 concerning the age 7 and 11 child. A number of candidates took the 'use ideas from your own investigation' too literally and described a trend that they had found in their own results.

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