

Version



**General Certificate of Education (A-level)
June 2012**

Biology

BIO3X

(Specification 2410)

**Unit 3X: Externally Marked Practical
Assignment**

Report on the Examination

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General Comments

Students found little difficulty in carrying out the instructions relating to the practical activity and obtained data to process. Overall the paper provided a very good range of marks. Task 2 proved to be more challenging in terms of the calculations and data obtained for processing. Examiners felt the overall standard of tables and graphs was lower than last year. This was probably linked to the complexity of the data obtained.

Task 1

Table

The vast majority of students calculated mean number of beats correctly and the mean pulse rate in beats per minute. Most could also calculate standard deviation correctly. Only a small number did not attempt this calculation or made rounding errors.

Question 1

The majority of students understood the principle here. The main errors were to suggest a period of exercise before taking the pulse or to compare the rate to the pulse rate when waking.

Question 2

The majority of students had good understanding of standard deviation and gained full marks, but comments relating to the fact that it involves all the measurements were rarely seen. The use of the word 'range' caused some problems.

Question 3

- (a) Very few students scored full marks here. Many scored the mark for stating that a small difference in measurement over 20 seconds would produce a large difference in pulse rate when multiplied to 60 seconds, but failed to refer to the idea of missing part of a beat. References to stop-clock errors or miscounting were common.
- (b) Most did score 2 marks here with many understanding that the pulse rate changes after exercise and the difficulties of losing count over a longer period of time. Some referred to results not being so accurate, but there was also some confusion over the terms validity and reliability.

Task 2

Question 4

Many students found their data confusing to process into a table and in some cases it was difficult to interpret what they had done. Some failed to have clear column headings with units or to identify the independent variable. A number of students used the abbreviation 'm' instead of 'min'. As students found the data more complex to process, fewer marks were gained here than in previous papers.

Question 5

It was rare not to gain the mark here if it was clear the student had performed the task as described in the method.

Question 6

There was more differentiation in the range of marks this year. Plotting errors were the most common reason for failure to gain marks, followed by labelling of axes, scaling errors and the drawing of inappropriate curves. Some examiners noted the number of poorly presented graphs this year from some of the centres they saw.

Section A

Question 7

Most students offered valid responses relating to standardising the time and the method of exercising and gained full marks, though a few referred to aspects already given in the method.

Question 8

Few students could explain that more frequent counts could give a clearer idea of the change in pulse rate after exercise. There were vague references to 'see the change' or simply to make it more reliable or accurate.

Question 9

Responses here tended to be centre-specific. Some referred to the idea of joining the points when the data are continuous or show a correlation. Others were confused and wrote 'when you are certain of the intermediate values'.

Question 10

Most students went for the 'yes' option and stated that the results could then be compared. Better students added the idea that their resting pulse rate may be different. Poorer responses related to differences in health or fitness between students.

Question 11

Nearly all students calculated resting pulse correctly. Those who failed to score here were using results after exercise.

Question 12

This question scored highly with most students correctly referring to 'more oxygen being available for respiration'. There were a few students who incorrectly suggested that energy was 'made' or 'produced'.

Section B

Question 13

Most students could gain credit here for the idea that the ECG does not miss beats or gives more accurate (nearer the true value) or precise (low variation between repeats) measurements. Again, there was some confusion over the terms accurate and reliable.

Question 14

(a) It was surprising how many students failed to gain the first marking point. Having been given the value of 69.2, some students gave an incorrect figure due to the fact that it was not possible to have 0.2 of a beat. Some carried out calculations. Only better students could score the second marking point by relating the pulse to the contraction of the heart.

(b) Most students scored highly on this question.

Question 15

Most students score one mark for the idea that filling time decreases and better students provide a correct quantitative statement for 2 marks. Some provided a reason for the decrease and failed to score the second mark.

Question 16

The part of the question that stated ‘the method you used’ was ignored by many and they tended to describe use of treadmills or walking, jogging and running instead of remaining with ‘squats’. Other answers discriminated well, with lower level responses referring to a general idea of increasing the exercise and better ones adding references to duration or frequency of the squats.

Question 17

This question provided a complete range of marks. Some students tried to explain the reason for a link and simply described the symptoms of coronary heart disease. Many discussed other factors affecting CHD, not apparently appreciating that some factors had been taken into account. References to small sample size also indicated that the resource had not been studied in detail. Others simply cited the idea that ‘correlation does not mean causation’. Many students referred to the fact that the percentage of patients dying was related to a higher heart rate and some stated that cause of death could be something other than CHD. Many, however, simply gave ‘standard’ answers rather than evaluated the resource material provided.

Question 18

- (a) Many students scored here. Some responses simply referred to ‘results’ rather than the ‘mean’ being reliable and others had the erroneous idea that anomalies should be simply discarded.
- (b) Most students understood the principle here and had pollution, diet and lifestyle as the most common factors that could affect people living in different areas. The term ‘regional bias’ tended not to be used but students could correctly use examples to illustrate the point.

Question 19

Very few students failed to score full marks here. The only problem arose when students did not fully understand the term placebo. Weaker responses simply referred to the control group being given no pill.

Question 20

- (a) Most students gave a correct response here, though some simply repeated the idea that more blood enters as heart rate slows rather than explained why.
- (b) This question provided a range of responses. Very few students achieved 3 marks. Good students referred to more blood or oxygen reaching the heart muscle, although weaker responses failed to mention heart muscle and simply referred to the heart in general. Only better students could link this to more blood leaving the heart or used terms such as stroke volume or cardiac output. It was disappointing to note how few students referred to the blood reaching the heart muscle via the coronary arteries, generally a standard marking point in questions related to angina.

Mark Ranges and Award of Grades

Grade boundaries and cumulative percentage grades are available on the [Results statistics](#) page of the AQA Website.