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ASSESSMENT and QUALIFICATIONS ALLIANCE

General Certificate of Education

Applied Science 8771/8773/8776/8777/8779

SC08 Medical Physics

Report on the Examination

2010 examination - June series

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General Comments

A large number of candidates were, as usual, well prepared for this examination. However, some candidates showed little knowledge and understanding of basic concepts and were clearly unready to sit this examination. It was pleasing to see that, on the whole, students showed a better understanding of experimental work this year. There were still problems, however, because many candidates failed to think about the context of the questions asked and provided completely inappropriate answers.

Question 1

(a) Most candidates were able to match the majority of the conditions to the appropriate diagnostic/monitoring equipment.

(b) Many candidates did not know that fever is diagnosed at temperatures above 37.2ºC.

(c)(i) Most candidates gained at least 1 mark.

(c)(ii) Generally correctly answered.

(d)(i) Generally correctly answered.

(d)(ii) Few candidates answered this correctly. Many did not relate the figures to the action of the heart. Several candidates thought that one figure was blood pressure and the other pulse rate.

Question 2

(a)(i) The graph was generally well plotted.

(a)(ii) Few candidates recognised the precise relationship between the variables though many said there was a positive correlation which was insufficient to gain the mark.

(b)(i) Many candidates gained at least one of the marks available though a significant proportion were unable to manipulate the equation involved.

(c)(i) Most candidates identified an appropriate condition though some gave a response, such as ‘tumour’ which was too vague to gain the mark.

(c)(ii) Generally well answered though some candidates forgot that the question was about diagnosis and discussed a therapeutic use which did not gain credit.

Question 3

(a) Most students gained 3 or more marks in this question. Marks were generally lost for failing to describe how the count rate would be measured and for poor quality of written English. Some students, however, suggested completely inappropriate experiments. At a basic level this included comparing penetration powers of different isotopes but some students actually suggested that the radioisotope be implanted in a human before measurements were taken.

(b) Most candidates were able to suggest a suitable time interval and provide a basic justification for their choice.

(c) Most candidates identified background radiation as a likely source of error.

(d) Most candidates suggested at least one suitable precaution. Many failed to gain marks because their suggestions were unrealistic.

Question 4

(a) Most candidates gained at least two marks in each part of this question.

(b) Most candidate gained one or two marks in this question.

Question 5

(a) About half of candidates knew the minimum frequency for ultrasound.

(b) Most candidates gained at least two marks in this question.

Question 6

(a) Most candidates knew the correct equation but manipulation of the equation and/or substitution of correct numbers was a problem for many candidates.

(b) About half of candidates knew the correct equation but, again, manipulation of the equation and/or substitution of correct numbers was a problem for many candidates.

(c) Most candidates knew that gel reduced reflections so gained one mark.

(d) A significant number of candidates gained at least three marks in this question. Marks were lost due to poor quality of written communication and also basic lack of knowledge of how X-ray photographs were produced.

Question 7

(a) In all parts of this question, most candidates gained at least one mark for identifying an isotope with either an appropriate half-life or emitting appropriate radiation. Very few were able to consider both aspects simultaneously and therefore gain full marks. There were particular problems with part (iii) where candidates did not recognise that the isotope was being used externally and spoke about radiation being able to leave the body.

(b) In both parts of this question, most candidates gained at least one mark.

Mark Ranges and Award of Grades

Grade boundaries and cumulative percentage grades are available on the **Results statistics** page of the AQA Website.