



ASSESSMENT and  
QUALIFICATIONS  
ALLIANCE

**General Certificate of Education**

**Applied Science**

**8771/8773/8776/8777/8779**

**SC08      Medical Physics**

**Commentary**

***Specimen Paper***

***2010 examination onwards***

# Quality of Written Communication / Stretch and Challenge

## GCE Applied Science Unit SC08 Commentary to accompany modified June 2008 paper

This A2 examination paper, in its original form, was available for candidates in the June 2008 examination session. The original paper has been modified to incorporate both Quality of Written Communication (QWC) and Stretch and Challenge. The total mark available for the paper has remained unaltered at 80 marks; this ensures that the weighting of Assessment Objectives in the paper fall inline with that given in the specification and those outlined in the GCE Applied Science subject criteria.

### QWC

In the original examination paper QWC was not formally assessed, although there were opportunities for candidates to demonstrate their extended writing skills. In this modified version of the examination paper, QWC has been integrated into both questions and the mark scheme. QWC has been assessed in 2 questions which require an extended prose answer and have 5 marks available, these questions are:

#### Question 4(b) Question 5(e)(i)

The mark scheme applied to both of these questions uses a level approach to marking. Details of the descriptors corresponding to each level are provided in the table below, a copy of this table is provided with the mark scheme for each question which assesses QWC.

| The mark scheme for this part of the question includes an assessment of the Quality of Written Communication (QWC). There are no discrete marks for the assessment of written communication but QWC will be one of the criteria used to assign the answer to an appropriate level. |       |  |
|--|-------|--|
| Level  | Marks | Descriptor   |
|  |       | an answer will be expected to meet most of the criteria in the level descriptor  |
| 3  | 4-5   | The answer: <ul style="list-style-type: none"><li>• is full and detailed and is supported by an appropriate range of relevant points such as those given in the example below.</li><li>• is well structured with minimal repetition or irrelevant points. There is an accurate, fluent and clear expression of ideas.</li><li>• contains only minor errors in the use of technical terms, spelling, punctuation and grammar.</li></ul> |
| 2  | 2-3   | The answer: <ul style="list-style-type: none"><li>• has some omissions but is generally supported by some of the relevant points given in the example below.</li><li>• shows some attempt at structuring, the ideas are expressed with reasonable fluency and clarity.</li></ul>   |

|   |     |   |
|---|-----|---|
|   |     | <ul style="list-style-type: none"> <li>contains a few errors in the use of technical terms spelling, punctuation and grammar.</li> </ul>  |
| 1 | 0-1 | <p>The answer:</p> <ul style="list-style-type: none"> <li>is largely incomplete, it may contain some valid points which are not clearly structured.</li> <li>is unstructured with a lack of fluency and/or clarity.</li> <li>contains errors in the use of technical terms, spelling, punctuation and grammar.</li> </ul> |
|   |     | An example of a Level 3 type of answer that may be produced would be:   |

In questions which assess QWC, the Principal Examiner will provide an answer typical of a Level 3 performance in the mark scheme. Examiners will be given clear direction as to the marking of such questions at standardisation meetings. When marking the papers, Examiners will firstly allocate the answer to a particular level and then to a specific mark, based upon the information as outlined in the descriptor. It is impractical at this stage to provide a typical answer which indicates performance across all 3 levels and covers all mark ranges.

### **Stretch and Challenge (including synoptic assessment)**

Candidates who successfully complete their AS qualification (Single or Double Award) may then go on to complete either:

- A2 Single award
- 9-Unit award
- A2 Double award.

In all of these qualifications, the AS units which are common are SC01, SC02 and SC03. In addition, all A Level candidates must also complete SC07. For this reason the synoptic content contained in this paper can only come from these units.

A requirement of the subject criteria for GCE Applied Science was to provide an opportunity for synoptic assessment within the specification. It was agreed with QCA that in the AQA GCE Applied Science Specification, SC07 would be the synoptic unit. This is where areas of study 9-12 of the subject criteria are evidenced from a substantive investigation. In order to complete the requirements of SC07, candidates must bring together knowledge, skills and understanding from any area of the A2 specification they study (see Section 8.3 of the current specification).

Explicit synoptic content in this paper is provided in:

- Question 4(a)(i) – Unit 2 (Energy Transfer Systems) and
- Question 5(e)(i) – Unit 7 (Planning and Carrying out a Scientific Investigation)

Stretch and challenge requires:

- (a) *The use of a variety of stems in questions to avoid a formulaic approach through the use of such words as: analyse, evaluate, compare, discuss.*

In the context of the paper there are a range of stems for the questions used throughout, examples include:

- Question 2(a)(i) – suggest
- Question 2(b) – discuss
- Question 3(b) – state
- Question 3(d)(i) – explain
- Question 3(e) – compare and contrast
- Question 5(e)(i) – design
- Question 6(c)(ii) – compare

- (b) *Avoiding assessments being too atomistic, connections between areas of content being used where possible and appropriate – there will not be a requirement to have overall coverage of all content area or dependence between the different sections which would mean failure on the first part of the question dooms the performance on following parts.*

In all questions there is an overarching stem which is used to set the theme for the question, this is then carried through to all parts of the question. In the question there will be content relating to specific areas of the unit. We have endeavoured to ensure that in all questions there are appropriate connections made between areas of the content of the unit. In the vast majority of cases, and where it is practicable to do so, the answer to a part of the question is independent of previous questions asked to avoid assessment being too atomistic.

- (c) *Having some requirement for extended writing in all subjects except where this is clearly inappropriate e.g. mathematics.*

In the modified paper, there are two opportunities for candidates to demonstrate their skills at extended prose writing, and where Examiners feel that QWC is most appropriately assessed, these are:

- Question 4(b)**
- Question 5(e)(i)**

However there are several other opportunities for candidates to demonstrate their extended writing skills, these include:

- Question 2(b) (3 marks)
- Question 3(d)(i) (4 marks)
- Question 4(a)(i) (3 marks)
- Question 5(d) (3 marks)
- Question 5(f) (3 marks)

- (d) *Using a wider range of question types to address different skills i.e. not just short answer/structured questions. The use of open answer questions, questions based on case studies and stimulus materials are encouraged*

The modified question paper submitted uses a wide range of question types to assess candidate's skills, these include the use of short answer structured question as well as:

- Question 2(b) – a discussion of safety precautions
- Question 3(d)(i) – an explanation
- Question 3(e) – a comparison of CAT scans and X-rays
- Question 4(b) – a discussion of two methods used to monitor temperature
- Question 5(a)(ii) – a calculation
- Question 5(b)(i) – drawing a graph
- Question 5(b)(ii) – reading information from a previously drawn graph
- Question 5(d) – using previously information to evaluate the selection of a radioisotope with reasons
- Question 5(e)(i)(ii) – design of an experiment, discussion of sources of error

- (e) *Using improved synoptic assessment, asking candidates to bring to bear knowledge and the other prescribed skills in answering questions rather than simply demonstrating a range of content coverage.*

There are several opportunities within the paper which are explicitly synoptic (see above). In Question 5(e)(i) and (ii) candidates will need to have a clear understanding not only of the practical skills required to complete an experiment but also issues concerned with the possible sources of error. Health and Safety knowledge and understanding (safe working practice – see section 27.7 of the current specification) will be required in Question 2(b). The mathematical skills outlined in section 27.8 of the current specification provide an overarching set of skills which are required in several areas of the paper.

In questions which assess AO3, candidates are required to be able to use the generic practical skills which are developed throughout their course, skills such as planning, evaluation, analysis and drawing conclusions (page 170 of specification).