

## Principal Assessor Report 2003

**Assessment Panel:**

Physics

**Qualification area:**

**Subject(s) and Level(s)  
Included in this report**

Physics Higher

## Statistical information: update

<b>Number of entries in 2002</b>	
<b>Pre appeal</b>	9,616

<b>Number of entries in 2003</b>	
<b>Pre appeal</b>	9,484

### General comments re entry numbers

There has been a small decrease of 132 (1.4%) candidates at the pre-appeal stage.

## Grade boundaries at C, B and A for each subject area included in the report

Pass mark stage			
	Lowest Mark out of 90		
Year	A	B	C
2003	66 (73%)	55 (61%)	44 (49%)

### General commentary on passmarks and grade boundaries

- While SQA aims to set examinations and create mark schemes which will allow a competent candidate to score a minimum 50% of the available marks (notional passmark) and a very well-prepared, very competent candidate to score at least 70%, it is almost impossible to get the standard absolutely on target every year, in every subject and level
- Each year we therefore hold a passmark meeting for each subject at each level where we bring together all the information available (statistical and judgmental). The Principal Assessor and SQA Qualifications Manager meet with the relevant SQA Business Manager and Statistician to discuss the evidence and make decisions. The meetings are chaired by members of the senior management team at SQA
- We adjust the passmark downwards if there is evidence that we have set a slightly more demanding exam than usual, allowing the pass rate to be unaffected by this circumstance
- We adjust the passmark upwards if there is evidence that we have set a slightly less demanding exam than usual, allowing the pass rate to be unaffected by this circumstance
- Where the standard appears to be very similar to previous years, we maintain similar grade boundaries
- An exam paper at a particular level in a subject in one year tends to have a marginally different set of grade boundaries from exam papers in that subject at that level in other years. This is because the particular questions are different. This is also the case for exams set in centres. And just because SQA has altered a boundary in a particular year in say Higher Chemistry does not mean that centres should necessarily alter boundaries in their pre-exam in Higher Chemistry. The two are not that closely related as they do not contain identical questions
- Our main aim is to be fair to candidates across all subjects and all levels and maintain standards across the years, even as syllabuses evolve and change

### Comments on grade boundaries for each subject area

The markers judged the paper to be a fair one with good coverage of the content and to be of an equal standard to the 2002 Paper. The mean mark for Section A was 12.2, 0.3 marks lower than last year whereas the mean for Section B was 41.7, 0.6 marks higher, giving an overall increase of 0.3 marks. The paper this year gave the same amount of differentiation of the candidates as the 2002 Paper. The graph of the distribution of marks is similar to that of last year — although there is a slightly larger tail. However, the similarity was such that the grade boundaries were set at the same values as that of last year.

The lowest mark for an A was set at 66 (73%) which is 5 marks lower than that suggested by teacher's estimates.

The lowest mark for a C was set at 44 (49%) which is 4 marks lower than that suggested by teacher's estimates.

The grade boundaries for A, B and C at 73%, 61% and 49% are close to the notional boundaries.

## Comments on candidate performance

### General comments

The usual wide variation of ability of candidates was apparent. The distribution of marks, and some markers reports indicated that there were more poorly prepared candidates than last year.

Candidates found qualitative responses to questions to be the most difficult. Calculations were performed to a good standard while the quality of English was acceptable.

Markers reported little evidence that candidates had been unable to complete the paper because of a shortage of time.

### Areas of external assessment in which candidates performed well

Candidates were competent in the components of velocity in question 21.

Most candidates performed the calculation of pressure using  $\rho gh$  in question 23 (a) (ii) well.

The majority of candidates in question 26 (b) (i) recognized the MOSFET symbol.

Most candidates demonstrated good knowledge of the calculations concerning 27 (a) (ii) and (b) (ii).

The calculation of half-value thickness was performed well by the majority of candidates.

### Areas of external assessment in which candidates had difficulty

In question 22 (d) some candidates were confused when  $E_k$  was gained during the interaction.

Very few candidates in question 23 (a) (iii) realised that the increased pressure of water resulted in a decrease in the volume of air in the glass tube.

Few candidates read question 24 (a) correctly —“The temperature of the gas is then raised by 50°C” — and as a result most substituted 323 K incorrectly. In 24 (b) (i) although most candidates stated a correct equation few were able to substitute the correct values.

In question 25 (b) (iv) very few candidates were able to ‘Explain why the current does not fall to zero . . .’.

Candidates in question 26 (b) (ii) had difficulty explaining, the sequence of events taking place in the circuit to close the valve. In (c) of the same question there were very few correct explanations as to why the light left the prism.

In question 27 (a) (i) although well done, most candidates omitted that  $f \propto 1/\lambda$  or for  $f = v/\lambda$  that  $v$  is constant.

The majority of candidates in question 28 did not realize the significance of destructive interference in (a) (i) with regard to answering (b) (ii).

## Recommendations

### Feedback to centres

- ◆ Most candidates require practice in questions requiring a description and an explanation.
- ◆ Many candidates require practice in 'potential divider' type questions.
- ◆ Candidates should show the origin on any sketch graphs they draw.
- ◆ Candidates should use SI units, eg 2.3 seconds is the same as 2.3 s but it would be incorrect to write as 2.3 secs.
- ◆ Candidates should not truncate numerical answers e.g. the figure 22.49 m s<sup>-1</sup> to three significant figures is 22.5 m s<sup>-1</sup> not 22.4 m s<sup>-1</sup>.
- ◆ Candidates should be encouraged to read questions carefully.
- ◆ The use of 'text messaging' style English in answers should be discouraged.