

## Principal Assessor Report 2004

**Assessment Panel:**

**Technical Education**

**Qualification area**

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

**Technological Studies – Higher**

## Statistical information: update

Number of entries in 2003 (Pre Appeal)	992
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Number of entries in 2004 (Pre Appeal)	886
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### General comments re entry numbers

A very disappointing fall in numbers (of 106), this reflects the decision by some Education Authorities to present in only two Technical Education subjects - with the deleted subject usually being Technological Studies. It is however pleasing to note that the number of candidates scoring below 20% had decreased (from 38 in 2003 to 15 in 2004), suggesting perhaps that better use was being made of Intermediate 2, or that some of the centres not now presenting were those who previously had produced poor results.

## Statistical Information: Performance of candidates

### Distribution of awards

A	27.8%
B	21.3%
C	19.6%
D	8.1%
No Award	23.1%

### Comments on any significant changes in percentages or distribution of awards

No change in Upper A;  
A slight increase in Lower A (+1.8%), mainly coming from B (-1.5%);  
Small increase in C (+1.4%), giving an increase in the overall pass-rate of 1.5% (to 67%), compared with the previous 3-year average of 64.5%.

## Grade boundaries for each subject area included in the report

Distribution of awards	%	Cum %	Number of candidates	Lowest mark
A	27.8	27.8	246	74
B	21.3	49.1	189	64
C	19.6	68.7	174	54
D	8.1	76.8	72	49
No award	23.1	100	205	

### 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 prelim 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 arrangements evolve and change.

### Comments on grade boundaries for each subject area

The raising of the grade boundaries from the level of 2003 reflected the intention of the examining team to move from the 41% passmark in 2002 to the *a priori* over a period of two years. However, it was felt that the team had been too successful, in that the change was +6% in 2003 compared with a desired move of 4 – 5 %, and a further 8% was required this year to maintain appropriate, consistent standards and levels of difficulty.

## Comments on candidate performance

### General comments

Candidate scores ranged from 98% down to 5%; indicating full accessibility, especially for the most able candidates; full marks were attained for each question.

There was evidence of a slightly improving performance, with the overall pass-rate going up by 1.5%.

However, there were still areas of the syllabus in which candidates did not perform well, and this often appeared to be centre-related.

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

Questions 1(materials-testing) and 2 (flowcharting) produced good responses, and were good lead-in questions.

Question 5 ( combinational logic) was again very well answered.

Question 7 (PBASIC) was generally well answered.

Question 9 was well attempted in the first part (combinational logic)

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

Question 4 (nodal analysis) was a mystery to many candidates who were not able to isolate forces acting at ONE node and then perform vertical and horizontal analyses. The *hint* included in the question did assist candidates in making a start to the question.

Question 8 indicated that many candidates did not fully understand data-logging systems.

Question 9 (c) caused major problems with many candidates still unable to correctly apply the Principle of Moments.

## Recommendations

### Feedback to centres

#### Applied Electronics

There were no major problem-areas, though many candidates reduced question 5 to two-input logic gates, where three-input gates would have been more appropriate, and simpler. A noticeable number of candidates were unable to draw a push-pull driver (question 6).

Most candidates were unable to provide a sufficiently detailed explanation of the operation of the op-amp circuit in question 10.

#### Systems and Control

Each year there seem to be a number of centres whose candidates use non-PBASIC commands, or combinations of commands that are unacceptable in PBASIC. For example 'if...then *goto*...' appeared fairly frequently, and odd output instructions appeared: 'let pin5 = high' and '5 high' do not work. Centres should check carefully that the instructions they are using are acceptable in PBASIC.

#### Structures and Materials

The application of Principle of Moments continues to pose major problems. Many candidates omit distances in moments equations, use non-perpendicular distances, or incorrectly use sin and cos for components of forces.

Nodal Analysis was again found to be difficult by most candidates. In many instances candidates did not isolate a single node for analysis, but included forces acting at nodes other than the one being analysed. Other candidates took a known force and simply took vertical, horizontal, or inclined components using trig ratios, without any form of nodal analysis being applied. As in the Systems & Control comment, these difficulties seemed to affect candidates by centre rather than entirely randomly.