External Assessment Report 2013

Subject(s)	Technological Studies
Level(s)	Higher

The statistics used in this report are pre-appeal.

This report provides information on the performance of candidates which it is hoped will be useful to teachers/lecturers in their preparation of candidates for future examinations. It is intended to be constructive and informative and to promote better understanding. It would be helpful to read this report in conjunction with the published question papers and marking instructions for the examination.

Comments on candidate performance

General comments

Performance in this year's examination appeared poorer than in recent previous years. Fewer candidates scored very high marks (in the Upper A range), whilst there seemed to be a shift in performance for a significant group of mid-range candidates.

Logic, programming and stress/strain — questions with a predictable structure and format — were well answered, whereas those requiring a non-standardised approach were found to be more challenging.

There were several returning centres and centres presenting for the first time. However candidates from some of these centres did not appear to be well prepared for the examination.

The overall demand of the question paper was found to be (unintentionally) slightly higher, (in particular the Nodal Analysis, Question 10). This was addressed by lowering the Grade Boundaries across all grades.

Areas in which candidates performed well

- Q1 (logic): a good opening question; most candidates scored high marks.

- Q3 (moments): this question was generally well-answered, though confusion still exists in respect of component forces (use of correct trig. ratios).
- Q5 (programming): most candidates scored well in this question.
- Q6a) (stress/strain): the vast majority of candidates achieved full marks.

Areas which candidates found demanding

- Q2c) (MOSFET/bipolar comparison): some candidates found this question challenging.
- Q4 (transistor circuit): very few candidates took account of the transistor being switched on, and so used voltage divider ratios instead of Ohm's Law and Kirchhoff's Laws.
- Q7c) (explain operation of circuit): many candidates gave responses describing the components rather than explaining the operation; most candidates found it difficult to convey all the main points succinctly, often including minor points and missing important aspects.
- Q8c) (MOSFET-driver circuit): some candidates were unable to draw the correct MOSFET symbol; most candidates missed the protective diode.
- Q9a) (stress/strain): few candidates dealt correctly with the tightening stress.
- Q9c) (explain the operation): see comment above for Q7(c).
- Q9f) (data logging): some candidates missed the splitting of the 480 readings, and many were unsure of the read/write sequence.
- Q10d) (explain the operation): see comment above for Q7(c). Few candidates mentioned the 'middle state' where both lights were off.

- Q10f) (nodal analysis): most candidates addressed Node B, ignoring the unknown forces in 3 members there, then went on to Node D thereafter.
- Q11a)ii) (flow chart): this was very poorly answered; few candidates showed a correct sequence of operations.

Advice to centres for preparation of future candidates

1. Centres are advised to give more practice in explanation of circuit operation; there are many examples in previous SQA papers which illustrate the level/degree of detail required.

2. Confusion continues to exist over the resolution of forces into vertical and horizontal components (ie selection of 'sin' or 'cos'). Some centres appear to teach that 'cos' always applies to the horizontal component and 'sin' to the vertical, a convention which cannot always apply — indeed, this caused errors in question 3.

3. Questions which were of a 'standard' format, where candidates could apply a standardised approach, were generally attempted well. However, when a slightly different scenario was presented, many mid-range candidates lost marks by not identifying the change from the basic pattern, but simply applying the standard approach. For example:

- Q3 angles stated from vertical/horizontal
- Q4 transistor saturated
- Q7c) temperature *falling*
- Q9a) tightening stress
- Q9f) 480 readings
- Q11a) time interval between steps

There are many good examples to be drawn from past SQA papers, and centres are encouraged to give candidates practice in these throughout the course, and especially in preparation/revision for the examination.

Statistical information: update on Courses

Number of resulted entries in 2012	690

Number of resulted entries in 2013	735

Statistical information: Performance of candidates

Distribution of Course awards including grade boundaries

Distribution of Course awards	%	Cum. %	Number of candidates	Lowest mark
Maximum Mark 200				
A	35.0%	35.0%	257	138
B	21.1%	56.1%	155	111
C	21.1%	77.1%	155	84
D	7.2%	84.4%	53	70
No award	15.6%	100.0%	115	-

General commentary on grade boundaries

- While SQA aims to set examinations and create marking instructions which will allow a competent candidate to score a minimum of 50% of the available marks (the notional C boundary) and a well prepared, very competent candidate to score at least 70% of the available marks (the notional A boundary), it is very challenging to get the standard on target every year, in every subject at every level.

- Each year, SQA therefore holds a grade boundary meeting for each subject at each level where it brings together all the information available (statistical and judgemental). 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 management team at SQA.

- The grade boundaries can be adjusted downwards if there is evidence that the exam is more challenging than usual, allowing the pass rate to be unaffected by this circumstance.

- The grade boundaries can be adjusted upwards if there is evidence that the exam is less challenging than usual, allowing the pass rate to be unaffected by this circumstance.

- Where standards are comparable to previous years, similar grade boundaries are maintained.

- 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, and the mix of questions, are different. This is also the case for exams set in centres. If SQA has already altered a boundary in a particular year in, say, Higher Chemistry, this 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.

- SQA's main aim is to be fair to candidates across all subjects and all levels and maintain comparable standards across the years, even as arrangements evolve and change.