Technological Studies Higher

External Assessment Report 2008

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

The overall performance of candidates was slightly poorer than last year.

In particular, marks were lost due to difficulties with relatively basic transposition and arithmetic manipulation. Many candidates 'rounded off' to one significant figure at intermediate answers, which led to wildly varying and inaccurate final answers; unless otherwise instructed, (as in Q11), candidates should work to 3 significant figures throughout.

The majority of candidates found the 'explain'-type questions challenging, and in many cases simply described the electronic system (Q10(c) and Q11(c)) rather than explaining how the system actually operates for specific or changing input conditions. Centres should ensure that candidates are prepared thoroughly to answer such questions – previous examination papers provide typical examples at the appropriate standard.

In general, candidates appeared to manage their time fairly well, with most attempting the full number of required questions, though the last question was, in some cases, fairly fleetingly addressed as the examination came to a close.
Many candidates appeared to simply start at the beginning and work sequentially through the paper, without evaluating where best to direct their efforts; this led to Q12 being attempted by only a small proportion of candidates.

Areas in which candidates performed well

Q2 (materials) was the best-answered question, closely followed by Q9 (combinational logic). These are two areas in which candidates have great confidence. The PBASIC programming in Q1 was also done well, and the coin-sorter (Q4 – op-amps) was also well-attempted. Overall, candidates did somewhat better than expected with the lever in Q5, though many resolved vertically to obtain F, ignoring the reaction at P completely.

The PBASIC part of Q10 was well attempted, with most candidates gaining good marks.

Areas which candidates found demanding

Q3, stepper-motor programming, was poorly answered. Many candidates were unable to correctly interpret the timing diagram, (especially for the delay), and many were unfamiliar with the operation of the stepper-motor-driver IC.

The circuit diagram for the white-line follower, (Q8) caused problems of interpretation, with candidates not understanding how the LDRs controlled the two comparators. This question elicited the poorest overall response.

Responses for the Nodal Analysis (Q11) were, as usual, disappointing. Very few candidates resolved the forces in DF and EG into vertical and horizontal components; many analysed NodeB, ignoring the unknown reaction force acting at that point.
A sizeable number of candidates did not heed the instruction to work to greater accuracy in Q11, resulting in silly answers for the strain-gauge calculations.

Only a few candidates were able to answer Q12(c) at all usefully, and virtually all struggled with the mathematical content of the last part of the question, to calculate the thickness of the tube.

Advice to centres for preparation of future candidates

Structures are still perceived as difficult; more time needs to be spent in this area, with particular emphasis on how reaction forces work, and on the purpose of resolving forces into horizontal and vertical components.
There is evidence that candidates do not understand the theory of force analysis, but are simply 'jumping through the hoops' of a taught process.

The resolution of inclined forces continues to be problematic, with 'sin' and 'cos' often being selected incorrectly. There are techniques to help overcome this (see PA report 2007 for one example). Centres are encouraged to give some thought to this perennial problem.

Marks have been lost throughout most scripts as a result of difficulties with arithmetic transpositions and manipulations; clearly this is a problem existing in all Centres, but is one which needs to be addressed.

Very few candidates find it easy to express themselves clearly and fluently when called upon to 'explain the operation of'. Centres should spend some time and effort in developing a methodology to enable candidates to write down – in a logical and progressive format – the salient factors involved in *the operation of* the required system, (rather than simply a description of the physical elements of the system itself).

Statistical information: update on Courses

Number of resulted entries in 2007	770

Number of resulted entries in 2008	755

Statistical information: Performance of candidates

Distribution of Course awards including grade boundaries

Distribution of Course awards	%	Cum %	Number of candidates	Lowest mark
Maximum Mark - 100	-	-	-	-
A	21.3%	21.3%	161	66
B	18.4%	39.7%	139	55
C	21.6%	61.3%	163	44
D	10.1%	71.4%	76	38
No award	28.6%	100.0%	216	-

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.