DESIGN TECHNOLOGY

Introduction

The examining team continues to hope that the examination papers and this subject report will be useful for preparing candidates for future examination sessions, and will add to the material available to support teachers in their work.

Overall numbers of candidates and the number of schools has increased again compared with November 2005. There were 46 candidates (58% increase) from 12 schools at Higher Level and 15 candidates (46% increase) at Standard Level from 6 schools. 5 schools entered candidates at both Standard and Higher Level. It is gratifying to see the numbers continue to increase.

Four G2 forms were received for this examination, and thank you to those teachers for taking the time to complete them. The G2 forms are extremely valuable in providing feedback to the examining team and are always studied carefully during grade award meetings. Comments from the G2s are fed back to other teachers via this subject report.

The examining team continues to request teachers to feedback both positive and negative comments to inform the development of this still small, but growing, subject. Where teacher comments are informed by candidate reaction to the papers after the examination this would be particularly useful.

Overall grade boundaries

Higher level

Grade:	1	2	3	4	5	6	7
Mark range:	0-14	15-28	29-39	40-51	52-62	63-74	75-100

Standard level

Grade:	1	2	3	4	5	6	7
Mark range:	0-14	15-27	28-36	37-49	50-61	62-73	74-100

Grade boundaries are determined by matching the Grade Descriptors for Group Four (OCC) to the evidence available from marked scripts. Each paper is set in a way that ensures that it provides enough evidence to enable the use of the Grade Descriptors and also to ensure that there is appropriate syllabus coverage and that the papers are appropriately discriminating. Grade award meetings first determine the 3/4 boundary by inspection of the scripts for each component and matching with the Grade Descriptors, moving on to the 6/7 boundary and then the 2/3 boundary. Other grade boundaries are determined by interpolation from these three boundaries. The boundaries for Paper 1 are set with reference to the Paper 2 boundaries as the Papers 1 and 2 have the same syllabus coverage.

Internal assessment

Component grade boundaries

Higher level

Grade:	1	2	3	4	5	6	7
Mark range:	0-5	6-11	12-15	16-19	20-23	24-27	28-36

Standard level

Grade:	1	2	3	4	5	6	7
Mark range:	0-5	6-11	12-15	16-19	20-23	24-27	28-36

The range and suitability of the work submitted

The number of schools opting to take Design Technology in the November session continues to be very few, however the number of candidates work moderated has shown an increase since November 2005. Most schools submitted work of a suitable nature, but closer examination of the assessment criteria is still required if candidates are to obtain higher marks. Work ranged from design and make activities through to smaller laboratory based experiments.

Some schools did not complete the form 4PSOW correctly. All work that has been highlighted should be sent for moderation and project titles should be clear and represent the work done by students. In a number of schools there is still some confusion over what should be contained within the project report and logbook, however the logbook was not evident in all samples. The logbook is not formally assessed, but it helps the moderator to understand how the student tackled a given problem.

Where the logbook is used for ideas or any other work, reference to pages should be clear in the report. Teachers should highlight sections of work that are to be moderated.

Candidate performance against each criterion

P1(a): Most candidates seem to fare well in this section, but some candidates did not provide enough detail to score highly. Common errors included a repetition of a problem set by the class teacher and the omission of any reference to the projects feasibility and built in constraints. Hypotheses should be clear and specific to the investigation. Hypotheses that are generic are inappropriate if a student is to achieve a high mark in this aspect. When using the design project assessment criteria, students should produce a detailed specification, which can be used later when evaluating the project outcome.

P1(b): Most candidates displayed evidence of planning when tackling small laboratory investigations, but methods did not always attempt to control the variables. When considering the design project some candidates omitted a detailed plan of action and material list.

Time should be allocated to each procedure for realization. Those who had written their plan in retrospect failed to address some of the assessment criteria. Some students displayed evidence of ongoing work in the form of photographs and annotation. This is to be encouraged along with feedback to the plan.

DC: Smaller investigations where candidates had to collect raw quantitative data offered ample opportunity to address the assessment criteria, but some students did omit the necessary units. The design project allowed candidates to address most research issues, but marks were lost where candidates had omitted essential data to solve the problem. Data collection for project work should be focused and its use identified. Photocopies from textbooks and Internet pages should be annotated to illustrate their use. The generation of ideas was not always supported by an analysis against the specification.

DPP: Most candidates addressed some of the assessment criteria however modelling continues to be a weak area, which is underused by most candidates. Development work should where possible show evidence of sketches, CAD and 2D/3D modelling. Physical models should be tested where appropriate in order to satisfy the specification and aid final manufacture. In most cases the quality of working drawings did not offer sufficient detail for the product to be realized. Working drawings should be in an appropriate format, for example orthographic projection.

CE: In most instances insufficient time had been allocated to this aspect of the investigations. Some of the evaluation work was superficial and offered inappropriate recommendations. Evaluation against the design specification should be clear with strengths and weaknesses identified.

Those candidates who did fare well in this area offered recommendations in sketch format and a modified specification.

Recommendations for the teaching of future candidates

Teachers should try and provide more opportunities for students to improve upon coursework. Timings allowed for each piece of coursework should be revised so as to allow ample opportunity for students to write their findings in detail. It would be advisable to run through a design and make activity so as to allow students to familiarize themselves with the design cycle before tackling the design project. The OCC should be used so as to share good practice and resources.

Standard level paper 1

Component grade boundaries

Grade:	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Mark range:	0-7	8-10	11-14	15-17	18-21	22-24	25-30

General comments

One G2 was received for this paper. It indicated that the level of difficulty was appropriate, that the syllabus coverage was good, that the clarity of wording was good and that the presentation of the paper was good. The comments were that it was a very good paper with a good range of questions.

The mean for Paper 1 has been noted in past reports, and is included below in order to indicate the trend in means. The increase over past years seems to be leveling out this year.

Mean	Year
15.6	2003
18.8	2004
19.8	2005
19.8	2006

The table below indicates, in question order, how difficult questions were perceived to be as determined by candidate performance – the higher the difficulty index, the easier the question! The * shows the correct answer and the numbers represent the number of candidates providing each individual response. A discrimination index is also calculated. This compares the performance of the top 25% of candidates on a particular question with the top 25% of candidates overall and can vary between 0.00 and 1.00. With a small candidature the discrimination index is a less useful tool than it is in large entry subjects. All questions achieving a negative or low discrimination index are discussed at the grade award meeting.

Question	**A**	**B**	**C**	**D**	Difficulty Index	Discrimination Index
1	1		9*	5	60.00	.40
2	3*	2	2	8	20.00	.20
3	2	8*	3	2	53.33	.20
4	1		2	12*	80.00	.00
5	1	12*	1	1	80.00	.20
6	1		14*		93.33	.20
7	11*	4			73.33	.20-
8	8*	7			53.33	.40
9		14*		1	93.33	.20
10	1	3		11*	73.33	.40-
11	13*		1	1	86.66	.20
12	11*	4			73.33	.60
13	14*			1	93.33	.20
14	1	12*	2		80.00	.40
15	2		2	11*	73.33	.60
16	5	1		9*	60.00	.20
17	2	4	5	4*	26.66	.40
18	4	9*		2	60.00	.40
19		5	4	6*	40.00	.20
20			1	14*	93.33	.00
21	2	13*			86.66	.00
22	2	2	10*	1	66.66	.00
23	12*	1		2	80.00	.40
24	1			14*	93.33	.20
25	13			2*	13.33	.20-
26	1	2	2	9*	60.00	.80
27	1	1	6	7*	46.66	.80
28		3	12*		80.00	.40
29	4	1	1	9*	60.00	.40
30	1	2	8	4*	26.66	.20-

It is obvious that with such a small number of candidates that the Difficulty Index and the Discrimination index are of limited use, although the 4 questions with the lowest difficulty index were examined for validity: 2, 17, 25 and 30. It was decided all these questions were valid and the answers correct, so they were all retained for the reasons outlined below.

2: D is a significant distracter in this question because students have associated incremental and radical with old and new. While there is some logic to this, the more correct response is A because of the commonalities between incremental and radical, and convergent and divergent thinking.

17: some candidates selected option B and C, but given the intricate shape of the metal supports for the bench, D is the correct answer.

25: as returned bottles can be used in different ways by companies, the examining team decided to accept both recycling (A) and re-use (D) as correct answers.

30: the majority of students selected utilization (C) as the stage at which designers have least influence, but designers have significant influence over utilization because they design products for a specific purpose or use. Disposal (D) is the correct option because designers have very little influence over the various ways in which products can be disposed.

Question setters use a grid to develop Paper 1 and allocate questions to topics according to the hour weightings as identified in the Guide (see Appendix).

Standard level paper 2

Component grade boundaries

Grade:	1	2	3	4	5	6	7
Mark range:	0-4	5-9	10-12	13-18	19-23	24-29	30-40

General comments

One G2 was received for this paper. The teacher indicated that the level of difficulty was appropriate, syllabus coverage was good, clarity of wording was satisfactory and the presentation of the paper was good.

The comments included the feeling that the terms used in the paper may be hard for some students, for example ‘curtailment’ and ‘ecophobe’. The examining team is conscious of the importance to ensure that all the language used in all papers is accessible to all candidates to ensure paper validity, and we will continue to have that focus. In this instance, the term ‘ecophobe’ is used in the guide in assessment statement 6.2.6 and so students should be familiar with this term. ‘Curtailment’ is used in Question 1 in a number of instances, and while a more accessible term could have been used, it is possible for candidates to determine the meaning of the word from its context. For this reason the examining team decided to retain the question and the mark scheme.

Although teachers cannot ‘teach’ the contexts covered in Section A Question 1, they can use past papers to expose students to this type of question and emphasize the importance of attention to detail, e.g. always including units with the answer to calculations.

Teachers need to continue to encourage candidates to persist with all sections of all questions. A number of weaker candidates appeared to have difficulty with the first parts of a question and then not persist with the remainder of the question. Mark allocations and the action verbs are important indicators of the nature and extent expected in answers. It is worth teachers emphasizing this to candidates.

In general candidates made a good attempt at the paper. As has been the case in the past, it was pleasing to see that better candidates had structured their answers according to an understanding of the action verbs and the marks awarded for the question.

Section A - Question 1

Most candidates completed the calculations in both sections of 1(a) successfully. Most included the units of measurement in their answer, which were necessary to get the one mark.

Fewer candidates received full marks for 1(b), being a more complex calculation. Many divided by 4694 rather than understanding how to determine a percentage.

Many candidates received one mark for 1(c)(i), the most common answer being a concern for the environment, but an explanation was not offered for the extra mark.

The majority of candidates did not receive full marks for question 1 (c)(ii) by noting that the home modification strategy is more effective than the energy efficient vehicles.

Section A - Question 2

Few candidates noted both aspects of the definition that were required in 2(a) – making products and range of techniques. The candidates who understood what an AGV is generally did well in 2(b) and were able to make three distinct points in an explanation.

Section A – Question 3

Candidates coped well with question 3. Those who only received one mark were able to state a reason, but did not expand on that statement for another mark.

Section A – Question 4

The majority of candidates were successful in 4(a). There was a dichotomy of achievement in 4(b) where candidates either achieved full marks or no marks, indicating that some were not well prepared in this area.

Section B - Questions 4, 5 and 6

In this section, the extended response question is the most significant and a major challenge to many candidates and some preparation is needed for this. A framework for answers helps guide candidates towards a balanced answer and the achievement of a good mark. Planning helps and, for candidates who clearly thought about their answer and jotted down some notes on the question paper, there was the reward of a well-structured answer. Many candidates answer as ideas come to mind rather than answering the questions as set. Such answers are extremely difficult to mark and whilst examiners search hard for anything relevant, it is often very difficult to find anything that corresponds to the required material. Bullet points rather than an essay helps organise a response and candidates using such devices generally achieve higher marks by being able to identify clearly different points in their responses related to the marks available.

Unlike the formatted answer sheets in Section A, candidates have no guidance provided for the length of answer, and long answers rarely achieve more marks. There seems to be an optimum length of answer for the marks achieved of 1-3 lines for each mark, the shorter answers being dot points rather than prose, which is quite acceptable.

Section B - Question 5

This questions was the most commonly answered. While most candidates correctly responded to a(i), and a(ii), many did not do well in a(iii), clearly not recognizing the difference between craft and batch production.

Most candidates responded with the correct answer in b(i), those who did not achieve full marks in b(ii) failed to focus on the aesthetic nature of considerations.

The majority of candidates understood abrading and their description received the full 2 marks for question c(i). The majority of candidates did reasonably well in c(ii) by structuring their answer and making three points for each of three design objectives.

Section B - Question 6

The few candidates who attempted question 6 did so successfully, with the exception of a(iii) where they struggled to outline the significance of the design costs. Again, those who provided a structure in their answer to question c(iii) were most successful.

Section B - Question 7

The candidates who attempted question 7 generally did quite well. Some candidates had difficulty with a(ii), being unsure of how ecophobes would would relate to the packaging material. In question a(iii) a number of students could describe consumer attitudes but had difficulty relating them to the context. Candidates answering b(ii), while generally seeming to understand anthropometrics, provided general answers rather than specifics. Again, those who provided a structure in their answer to question c(ii) were most successful, but the majority received high marks.

Standard level paper 3

Component grade boundaries

Grade:	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Mark range:	0-3	4-6	7-8	9-12	13-16	17-20	21-30

General comments

Again the format for each of the Paper 3 options is that question 1 is a database question providing a stimulus and context for the question. The last question in each option is an extended response question worth 6 marks to provide a better opportunity for candidates to demonstrate their understanding. It is through the extended response question in particular that the more able candidates can demonstrate their ability and discrimination between levels of candidates can be determined.

One G2 was received which described the level of difficulty as appropriate, syllabus coverage as good, clarity of wording as satisfactory and the presentation of the paper as satisfactory.

Option F was the popular option done by candidates, followed by E and C, with 1 student doing each of Options A, D and G and none attempting Options B and H.

Option C

Most candidates were successful in 1(a). Some candidates lost marks in (b) by not being able to recall one of the proposals of the Earth Summit Conference.

A number of candidates misunderstood the term ‘barriers’ in question 2 to mean a physical barrier.

Candidates answering question 4 tended not to be well organized in their answer and consequently found it difficult to score high marks.

Option E

Few candidates received full marks for 1(a), mainly because of an inability to structure an answer. One mark was given for the main reason and then 2 marks for an explanation of that reason. Candidates seemed well prepared for question 1(b) and question 2.

In question 3 candidates seemed confused about how mass customization could relate to MDO, and consequently few achieved full marks.

Most candidates received good marks for question 3. Some candidates waste time and space with a long preamble, which may be appropriate for an essay, but in this case achieves no marks.

Option F

Many candidates knew the definition of innovation and successfully applied it to the handbag context in question 1(a). In question 1(b) few candidates received full marks because all three distinct points were required in the answer.

The majority of candidates achieved good marks in questions 2 and 3.

In question 4 many candidates received 4 marks by mentioning 2 points each for technology push and market pull rather than 3 points for each.

Higher level paper 1

Component grade boundaries

Grade:	1	2	3	4	5	6	7
Mark range:	0-10	11-14	15-18	19-21	22-25	26-28	29-40

General comments

Four G2s were received related to HL Paper 1. Two stated that the paper was felt to be a little more difficult than last year. The level of difficulty was deemed 'appropriate' in two responses, too difficult in another and too difficult in parts in the third. The syllabus coverage was good (2) and satisfactory (2), clarity of wording was deemed to be satisfactory (2) and poor, and the presentation of the paper was classified as satisfactory and good (2). One G2 commented on specific questions, which are discussed below. Two commented that it was a good test using appropriate questions and unambiguous answers, but some questions may be difficult for ESL students. The other G2 commented that the wording of the questions seemed to be deliberately tricky with only subtle differences between a right and a wrong answer.

An additional comment stated that the word 'ecofan' could not be found in the syllabus, but it is included in the assessment statement 6.2.6.

The examining team is aware of the need to achieve the correct balance in setting multiple choice questions in Paper 1's. The questions must discriminate well between levels of knowledge of students, but not be so obvious as to be open to guessing. This means there is often only subtle differences between the responses, and sometimes there is more than one correct response, but one is 'more correct' than another. So while the questions may seem tricky, the goal is not to trick the students but to test their knowledge.

The examining team also appreciates the reminder that many students do not have English as their first language. We often search for words and phrases that are the easiest to interpret and understand, sometimes difficult in technology, but it remains a priority.

The mean for Paper 1 has been noted in past reports, and is included below in order to indicate the changes in means. The lower mean compared with last year may confirm two teachers feelings that this paper was a little more difficult. This was considered in the determination of the grade boundaries for Paper 1.

Mean	Year
23.4	2003
27.1	2004
27.2	2005
22.2	2006

The table below indicates, in question order, how difficult questions were perceived to be as determined by candidate performance – the higher the difficulty index, the easier the question! The * shows the correct answer and the numbers represent the number of candidates providing each individual response. A discrimination index is also calculated. This compares the performance of the top 25% of candidates on a particular question with the top 25% of candidates overall and can vary between 0.00 and 1.00. With a small candidature the discrimination index is a less useful tool than it is in large entry subjects. All questions achieving a negative or low discrimination index are discussed at the grade award meeting.

Question	A	B	C	D	Difficulty Index	Discrimination Index
1	13*	7	9	17	28.26	.06
2			5	41*	89.13	.20-
3	38*	7	1		82.60	.06
4	26*	19	1		56.52	.00
5		6	1	39*	84.78	.00
6	29*	11	3	3	63.04	.00
7	36*	5	1	4	78.26	.13
8	3	1	2	40*	86.95	.13
9	9	5	2	30*	65.21	.46
10	8	3	12	23*	50.00	.46
11	6	38*	1	1	82.60	.26
12	7	5	25	9*	19.56	.33
13	10	33*	1	2	71.73	.20
14	18*	5	16	7	39.13	.26
15	9	2	1	34*	73.91	.33
16	32*	3	4	7	69.56	.26
17	8*	26	3	9	17.39	.06
18	24	17*	4	1	36.95	.40
19	29		3	14*	30.43	.06
20	7	4	9	26*	56.52	.46
21	4		38*	4	82.60	.20
22	6	29*	9	1	63.04	.20
23	9	19*	17	1	41.30	.40
24	7	6	13	20*	43.47	.40
25	22*	6	12	6	47.82	.53
26	5	13*	2	26	28.26	.26
27	15*	7	11	13	32.60	.26
28	4	25	8*	9	17.39	.06
29	12	13*	14	7	28.26	.26
30	2	3	40*	1	86.95	.26
31	7	7	19*	13	41.30	.26
32	7	6	9	24*	52.17	.46
33	7	2	31*	6	67.39	.40
34	11	2	31*	2	67.39	.06-
35		23*	4	18	50.00	.26

36	32*	1	7	6	69.56	.60
37	2		24*	20	52.17	.13-
38	36*		8	2	78.26	.46
39		9	16	21*	45.65	.33
40	22*	1	4	18	47.82	.13

As is normal practice, the questions with the lowest difficulty index were analysed by the examining team. This includes questions 1, 12, 17, 26, 28 and 29. It was decided all these questions were valid and the answers correct, so they were all retained for the reasons outlined below.

1: D is a significant distracter in this question because students have associated incremental and radical with old and new. While there is some logic to this, the more correct response is A because of the commonalities between incremental and radical, and convergent and divergent thinking.

12: many candidates selected C as the correct option, probably thinking that laminations are fused together. Fusing however is bonding by melting (4.1.6), and in lamination no melting is involved in the process.

17: while there is some developing research that cotton (B) may benefit from the introduction of clean technology in the future, steel production (A) would benefit most because it is traditionally a lot more polluting and has a much broader scale of production.

18: the majority incorrectly selected option A, but a careful reading of the question indicates that it relates to imposing fines, not developing legislation, and imposing fines is essentially re-active (B)

19: as returned bottles can be used in different ways by companies, the examining team decided to accept both recycling (A) and re-use (D) as correct answers.

26: the majority of candidates indicated that metal alloys (D) are used to make superconductors, but AS 7.5.7 indicates that non-metal oxides are one of the components of superconductors, so the correct answer is (B), metal and ceramics.

28: food (C) is the correct answer (see the Table in the Guide p 91). Many students selected (B) Plastics, probably because most of the discussion about bonding in the Guide is related to plastics.

29: about equal numbers of students selected options (A), (B) and (C) tending to indicate a general lack of understanding. Metallic (B) is the correct option because the diagram (Fig 3) is best described by the metallic discussion in AS 8.2.1.

Higher level paper 2

Component grade boundaries

Grade:	1	2	3	4	5	6	7
Mark range:	0-6	7-13	14-22	23-30	31-37	38-45	46-60

General Comments

Three G2s were received for this paper. One teacher judged the paper to be of a similar standard to last year. The level of difficulty was judged as appropriate by all, and the syllabus coverage and clarity of wording satisfactory, and presentation of the paper all judged as satisfactory by one and good by two.

One comment was that the paper was fair. Another comment was that some of the questions were in mixed order and if they were in syllabus order it would allow the students to work through the paper. While it is not a priority of the examining team that the order of questions reflect the syllabus order,

particularly in paper 2, we do strive for a logical and related order, and will continue to do so. An additional factor to consider is that not all teachers follow the syllabus order in their teaching.

The term 'ecophobe' was mentioned again in one comment as a slang word, but it is used in the guide in assessment statement 6.2.6 and so students should be familiar with this term. Other detailed comments are discussed in the question discussion below.

Section A

Each question within Section A is separate and does not assume understanding from previous questions. The use of parts (a), (b), (c) and sub-sections (i) and (ii) should provide some sign-posting to candidates about the structure of the question and the shift from one focus to the next. It is by no means clear that all candidates understand the significance of this. Teachers must continue to emphasise this to candidates and encourage them that if they falter on one part of Section A for whatever reason they should carry on with other parts which will explore different issues.

Question 1

Question 1 is a data question.

Parts a(i) and a(iii) posed no significant problems for candidates. A common error in question a(ii) was to compute 33 lamps rather than 34.

Very few candidates received full marks for question 1(b), but those who showed all their working had the possibility of at least receiving some marks even if the answer was wrong.

The majority of candidates received at least one mark for question c by talking about more focused or sharper light, but few went on to outline that reason for another mark.

Very few candidates had difficulty with d(i), most getting both marks. However few received full marks for d(ii) , although those who showed their working at least received some marks.

Most candidates seemed to have few problems and provided adequate answers for e(i) and e(ii).

Questions 2 - 6

These questions provided syllabus coverage and represented good discrimination. Questions in which candidates experienced difficulty will be noted.

Many candidates received 2 marks for question 2(b) by describing wave and tidal power, but missed out on the third mark by not focusing on the question which asked for the <u>difference</u> between them.

Candidates seemed not well prepared for question 3(a), the most common answer being that alloys contain at least one metal.

Given that 4(a) is a relatively simple recall question, it was surprising that not all candidates received the 2 marks. The most common incorrect answer was aesthetics.

In question 4(b), many candidates focused their answer on using ergonomic data rather than on collecting.

A number of candidates answered 5(a) in general terms rather than specifics. Question 5(b) was a good discriminator between candidates, with many listing two reasons rather than outlining one reason.

Question 6 was generally answered well.

Section B

Parity of Section B questions and syllabus coverage remain conflicting constraints. The examining team continues to try hard to produce equally difficult questions whilst achieving syllabus coverage. The majority of candidates chose to answer Question 9.

The extended response question in Section B continues to be a good discriminator. With some candidates it remains clear that they do not approach their answer in a logical and structured manner. If three points are requested, then three subheadings or paragraphs should be clear in the answer. Even candidates who do well in the shorter answer questions but do not provide an organized answer to this question lose marks. Teachers need to provide students with guidance in this area.

Question 7

The very few candidates who attempted question 7 answered well, particularly well set out was the 9 mark question c(ii).

Question 8

In question a(i) many candidates listed a reason rather than outlined it. Teachers must make candidates aware that an 'outline' question requires a little more elaboration on the reason that just a simple statement.

Most candidates in question a(ii) correctly noted the symmetry of the structure, but few considered the mechanics of forces in their answer.

Candidates seemed to have a superficial understanding of product life cycle in their answer to question b(ii), correctly noting the mature stage, but being unable to relate that to the transmission tower.

The majority of candidates structured their answers appropriately in c(ii) and consequently achieved high marks.

Question 9

A common pattern of answers continued in a(i) with many candidates listing a reason but not describing it in more detail for 2 marks.

Many candidates misunderstood this question and related their answer to renewable resources rather than focusing on the product. This could be the result of not having read the question carefully prior to answering.

Candidates generally performed well in question b and c(i). The majority were also able to identify the issues required in question c(ii), but some did not achieve full marks because of an incomplete discussion of the issues.

Higher level paper 3

Component grade boundaries

Grade:	1	2	3	4	5	6	7
Mark range:	0-4	5-10	11-14	15-19	20-25	26-30	31-40

General comments

Three G2s were received for Paper 3, a pleasing response compared with last year when none were received. Please maintain this feedback.

One judged the paper to be of a similar standard to last year. All judged the level of difficulty as appropriate, two stated the syllabus coverage as satisfactory and one as good, two said the clarity of wording was satisfactory and one good, and one judged the presentation of the paper as satisfactory and two as good. All the comments provided about the paper were positive.

Candidates seemed well prepared for the extended response questions and provided balanced and well organized answers. For those candidates who knew their content reasonably well, marks were lost for two main reasons:

- not reading and understanding the question well
- not structuring their extended answers.

It was noticed again that where candidates go onto an additional sheet to answer the extended response question that it is only those candidates who were using a framework to structure their answers who were picking up marks on the additional sheets. Again, volume is no indicator of quality!

There was no indication of any differences in performance across the different options, particularly in the extended response question, which is pleasing.

Overall the Paper 3s produced a good spread of marks and reasonable discrimination was achieved. The mean for the Higher Level Paper 3 in 2004 was 23.5, in 2005 it was 23.8 and this year it was 21.8. It was pleasing to note that the schools offering this paper for the first time achieved above the mean.

In teaching the options teachers are advised not to leave the options to last but to incorporate the option into the core and particularly into the practical work so candidates have some 'hands on' experience of the option in order to both broaden and deepen their understanding, and more effectively enable their application of content to a range of contexts.

The trend continued in this paper with most candidates choosing Options E and F. Options D, G and Option H were notably unpopular.

Option E

Questions 1(a) was not done well. The tendency for many candidates was to repeat the Figure E1 description rather than indicate clear understanding. The candidates who did not achieve both marks in 1(b) often listed the advantages of CAD generally rather than MDO specifically.

In question 3 candidates seemed confused about how mass customization could relate to MDO, and consequently few achieved full marks. Many repeated the definition of mass customization.

The majority of candidates performed reasonably well in question 5, and as is usually the case those with an appropriate structure of 3x3 received higher marks.

Option F

Many candidates knew the definition of innovation and successfully applied it to the handbag context in question 1(a). In question 1(b) few candidates received full marks because three distinct points were required in an explanation.

Although question 4 was a simple 'list' question, each factor needed to focus on the global context and not just innovation generally, and students who did not contextualize their answer in this was did not receive marks.

The majority of candidates performed reasonably well in question 5, and as is usually the case those with an appropriate structure of 3x3 received higher marks.

Conclusion

The increase in the candidature for the subject continues to be a pleasing feature. Congratulations to all candidates on their success and to teachers in facilitating this success.

The understanding of the action verbs (e.g. state, list, outline, describe, explain – see pages 8 and 9 of the Guide) seems to be continuing to increase in relation to required responses to questions. It also seems that more candidates are recognizing the significance of the mark weighting in relation to the expectations of the answer, though there are still some candidates who do not use this link. Familiarity with the way that the paper is constructed and particularly the way that action verbs signal expectations is an important part of candidate preparation and cannot be over-emphasized.

Teachers should continue to stress the importance of 'sign-posting' answers with headings and bullet points or using tables to identify distinct points. Candidates should also be encouraged to confirm their understanding of the extent of the answer required by checking the mark allocation for the question.

Teachers should continue to familiarize themselves with the Group 4 Grade Descriptors (see OCC). The examining team continues to strive to:

- ensure appropriate syllabus coverage;
- use accessible design contexts understandable around the globe;
- ensure parity between optional questions;
- make the expression of questions as straightforward as possible (particularly for second language candidates);
- ensure that the various examination elements discriminate appropriately between stronger and weaker candidates;
- ensure that there are opportunities for candidates to provide evidence for the different aspects of the Group 4 Grade Descriptors within the examination papers to enable the Grade Descriptors to be used in the setting of the grade boundaries at the Grade Award meeting.

Teachers are encouraged again to contribute comments on the papers through the G2 Form and so assist in the continued development of DT as a relevant, practical and worthwhile aspect of the curriculum.

APPENDIX

Standard Level (SL) Paper 1

This comprises 30 multiple choice questions (MCQs) across the 6 topics comprising the SL core. To ensure appropriate coverage of the syllabus the number of MCQs on each topic should reflect the teaching hours for each topic, as identified in the Design Technology Guide and indicated in the table below:

Topic	Teaching hours	Number of MCQs
1	15	7
2	11	5
3	6	3
4	8	4
5	9	4
6	16	7
Total	**65**	**30**

Higher Level (HL) Paper 1

This comprises 40 MCQs across the 9 topics comprising the HL core. Again, to ensure appropriate coverage of the syllabus the number of MCQs on each topic should reflect the teaching hours for each topic, as identified in the Design Technology Guide and indicated in the table below:

Topic	Teaching hours	Number of MCQs
1	15	4
2	11	3
3	6	2
4	8	3
5	9	3
6	16	5
7	15	6
8	19	8
9	15	6
Total	**114**	**40**

Fifteen of the questions on topics 1 – 6 are common to SL and HL papers to enable comparison of achievement by SL and HL candidates.

