

## Design Technology

### Overall grade boundaries

#### Higher level

<b>Grade:</b>	1	2	3	4	5	6	7
<b>Mark range:</b>	0 - 14	15 - 26	27 - 39	40 - 51	52 - 63	64 - 75	76 - 100

#### Standard level

<b>Grade:</b>	1	2	3	4	5	6	7
<b>Mark range:</b>	0 - 14	15 - 27	28 - 40	41 - 50	51 - 61	62 - 71	72 - 100

### General comments

The overall performance of candidates was an improvement on May 2013 particularly in relation to grades for the Internal Assessment component which had a significant impact on the overall grades achieved.

Comments received on the G2 feedback forms indicated that there was general satisfaction with the written papers and that questions were more accessible to candidates than in the previous year, this was especially the case with Paper Three.

Some concern was raised by members of the Grade Award team at the general standard of Standard Level candidates, particularly at the higher end of the grade spectrum. It is recognized that many candidates choose Design Technology at Standard Level because they are not strong Science students and they need to choose a Group Four subject. It was also interesting to note that candidate numbers have not risen at Standard Level but at Higher Level they continue to rise exponentially. Some members of the Grade Award team speculated that there may be an increasing perception amongst teachers and students that the Design Technology course at Standard Level is not an easy option.

## Standard and Higher level internal assessment

### Component grade boundaries

<b>Grade:</b>	1	2	3	4	5	6	7
<b>Mark range:</b>	0 - 8	9 - 17	18 - 25	26 - 32	33 - 39	40 - 46	47 - 60

### Recommendations for IB procedures, instructions and forms

Most schools continue to follow the correct procedures when submitting work for moderation, with only a few choosing to design their own 4/PSOWDT. Those that use this approach need to ensure that all data fields are included for moderation. Older 4PSOWDT forms should be updated with those available on the OCC and in the handbook of procedures. Schools should ensure all data fields are completed, to include candidate numbers, specific names of investigations and projects, time per investigation, syllabus coverage and use of ICT applications. Marks for each candidate should be checked against those entered on to IBIS.

Inappropriate work, although only in a few cases, continues to be used for assessment. Such work includes group tasks where write-ups are a collaborative effort, literature research assignments and PowerPoint presentations. Such work can continue to be used for class tasks, but should not be used for assessment. Teacher notes for each investigation are to be included with the sample and where possible work should be clearly flagged to aid moderation. Work should be clearly labelled, to include investigation title, candidate name and number. It is not necessary to send all work for moderation, as only the investigations and project with the highest marks are needed for each criterion. Scanned and photocopied work must be legible if schools are to avoid requests for further copies and evidence of work. Schools are reminded that work should be presented in A4 format only.

### The range and suitability of the work submitted

A wide range of suitable projects and investigations were evident in the samples received for April 2014. This was the largest sample to date and most schools are to be commended on their creativity and imagination in devising suitable investigations that meet the requirements of the IB DT course. Work included small design and make activities based on the design cycle and experiments that followed a more scientific approach. Those schools that are established in the teaching of IB Design Technology, or have recently attended training continue to do well when developing a course that meets the assessment criteria. Some schools choose to assess design and make activities for all investigations thus limiting the number of projects that can be completed in the time available.

Small lab based investigations tend to require less time than design and make tasks (normally no more than 3-4 hours) and the integration of such assignments in to the course structure is to be further encouraged as it is possible to target each assessment criterion individually if candidates need further opportunities so as to raise achievement. Such investigations tend to address the assessment of Planning (P), Research (R) and Evaluation (E), although to achieve a high attainment for each, research questions should ideally address a context and hypothesise what the outcome of the investigation will be. Priorities for research which included control of variables, apparatus and a clear strategy to collect data were evident in the best work.

Teachers are to be reminded that candidate work should not be assessed where too much information has been provided, as the work must be of that of an individual candidate. This is common when outlining a suitable project/investigation task and as a result more open ended tasks are required for the assessment of Planning. Where group work is to be assessed, each candidate must show evidence of their own work. It is not satisfactory for a group to submit one common document or share written work for assessment.

Literature assignments and product analysis tasks which include PowerPoint presentations, historical documents, essays based on visits are not suitable for assessment of Development. Only tasks that are suitable to achieve a maximum of six marks per criteria should be used to assess work. Teachers should consider what will be expected of candidates to achieve a high score for each aspect before undertaking such projects. Not all tasks are suitable for assessment and further planning and development of schemes of work are required if students are to be given appropriate opportunities.

## Candidate performance against each criterion

### Planning (P)

The majority of candidates were able to achieve a minimum of at least a Partial for this criterion. However, some candidates did not perform so well, especially when repeating a common problem set by the class teacher or when submitting identical work of another candidate. When using the assessment criteria for a design project, candidates should consider the feasibility of the study, identify the user, write a clear brief which identifies the intended goal and write a detailed specification. The most detailed specifications are composed on summary of the research and are best presented in order of priority. Quantitative constraints should be clear and criteria justified. Where possible photographic evidence, market research and newspaper articles should be used to help outline problem and establish the need. When completing a lab based investigation a problem is to be identified and independent/dependent variables made clear. Work should be clearly titled, and where possible include reference to the assessment aspects.

Care must be taken not to mark research used for identifying a problem twice whilst also making use of it for collecting data to solve the problem. Teachers are encouraged to annotate work to show where marks are awarded if this is the case.

### Research (R)

Not all candidates had considered the need to plan data collection from a variety of sources or include a list of apparatus and order of method for an experiment. Further detail is generally needed here for candidates to be awarded complete. Strategies for research were generally weak and in some instances not considered at all, but full marks had been awarded by the teacher for this section. Candidates should fully analyze the brief in Planning if they are to prioritize strategies in which to identify wider issues to be researched. Candidates that achieved a high mark in this section displayed evidence of focused research that had been annotated to indicate its relevance in order to solve the problem. A wider range of data primary and secondary sources is needed if not to simply rely on data sourced purely from the internet. A large number of candidates submitted unfocused research which included a wide range of materials and fixings. Such work is to be avoided as time could be better used developing ideas and models. Smaller laboratory-based investigations where candidates had to collect raw qualitative/quantitative data offered ample opportunity to address the assessment criteria, but some candidates had failed to identify anomalies or process the information correctly. Tables and graphs should be correctly labelled, and analysis detailed.

Literature research assignments that offer no evidence of prioritizing research, or using a range of primary and secondary sources are considered inappropriate tasks and are to be avoided for the purpose of assessment.

## Development (D)

There is still some confusion regarding which type of investigation suits this assessment criterion. Design based activities, where candidates have the opportunity to generate and develop an innovative range of ideas using suitable techniques, such as sketching, CAD or modelling is the most appropriate type of task to address the assessment needs. Other tasks can be considered, but only tasks where a full 6 marks can be achieved should be considered. Some schools continue to misinterpret the criteria and submit inappropriate work. Development is to include an element of refining solutions through modelling and the use of a wider range of techniques to optimise a solution is to be encouraged. Detailing for the solution to be realized needs to be detailed and presented in an appropriate format, such as engineering drawings. Detailing needs to be clear and sufficient for projects to be made.

Lab based investigations are generally inappropriate for assessing Development, so are PowerPoint presentations when explaining and discussing research in class. Web design projects are to be avoided if students are to address all aspects.

## Evaluation (E)

Some candidates produced significant work in meeting this criterion, but others did not leave sufficient time to conduct a detailed evaluation of the outcome and procedures. Ideally candidates need to test their outcomes in the area designed for, or with the user for whom it had been designed. Evaluation of specifications should be critical, although positive, ticks and crosses are not sufficient. Projects which offer a limited or virtual outcome do not lend themselves well to addressing this assessment criterion, especially when it comes to testing, identifying weaknesses and suggesting realistic recommendations. Recommendations to projects need to include a revised specification, sketched modifications and consider the need for scaling up production. For laboratory-based tasks, candidates need to evaluate the method of data collection and identify weaknesses in order to suggest improvements as this is often confused with improving the material or item being tested. Further emphasis is needed if candidates are to achieve a complete for each aspect of Evaluation. When planning a course sufficient time should be provided to complete a detailed response. At present this along with development is generally the weakest aspect of student work.

## Manipulative Skills (MS)

In most cases thorough planning had taken place, but there is a need for some schools to be more detailed in their identification of materials and processes in order to plan time effectively. Engineering drawings are assessed as part of the development, but they can be referred to and altered if necessary throughout the making process. The best examples included evidence of detailed plan of action, which included processes, materials, risk assessment and times, plus a photographic diary of making. Outcomes need to be of sufficient complexity for the level studied. Although some work fell below the standards needed, most was very good, some excellent and even sometimes well beyond the requirements of the course. Where this is the case a balance is needed so as to give each criterion equal weighting.

## Recommendations for the teaching of future candidates

- The assessment weightings and time allocations for Investigations and the Design Project need to be considered when developing a scheme of work in schools. Teachers need to consider what evidence is required for each aspect before starting investigations.
- Excerpts from the teacher support material, notes and project briefs should be attached to the sample of work. Marks selected for moderation need to be highlighted on the 4/PSOWDT form for each assessment criteria. Only the work that has been highlighted should be sent for moderation. Work is to be presented in A4 format.
- Teachers are reminded to check the OCC for regular updates regarding the new Design Technology syllabus for first examination May 2016. New Teacher Support Materials are being developed and will available on the OCC.
- Attendance at regional workshops and on-line training is highly recommended before teaching the new course in September 2014. The structure and assessment of the new Design Technology programme needs to be taken in to account before planning the two-year course.
- All candidates being entered for 2016 examinations should be using the new Design Technology subject guide.

## Higher level paper one

### Component grade boundaries

<b>Grade:</b>	1	2	3	4	5	6	7
<b>Mark range:</b>	0 - 10	11 - 15	16 - 20	21 - 24	25 - 28	29 - 32	33 - 40

### Comments

The following page includes a table that shows a breakdown of students' responses to the Higher Level Paper 1 in question order.

- The higher [counter intuitively] the 'difficulty index', the more candidates achieved the correct response, ie the easier the question.
- The higher the 'discrimination index', the more likely the better candidates were to have selected the correct response(s).

This year the candidature was 815, up by 32 candidates on the previous year's candidature of 783 students. Average performance was on a par with the previous year and the average mark was up by just 0.11 from 23.76 in 2013 to 23.87 in 2014.

We received four G2s. It is not clear why the number of G2s is so low. The examining team really appreciates any comments it receives and the G2s are carefully scrutinised in the Grade Award. We have to assume that people are reasonably happy if they do not comment – this may be an erroneous assumption. **Please, please, please take the opportunity to submit comments. Positive comments are as useful as negative ones.**

All four G2s described the difficulty of the paper as appropriate. Two thought that it was of a similar standard to the previous year and two thought it was a little more difficult.

In terms of clarity of working: one thought it was poor; two thought it was fair, and one thought it was very good.

In terms of presentation: one thought it was good and three thought it was very good.

## Difficulty and discrimination indexes for Higher Level Paper 1.

	A	B	C	D	Difficulty index	Discrimination index
1	8	774	29	3	94.97	0.13
2	45	18	532	219	65.28	0.31
3	731	74	1	9	89.69	0.14
4	274	92	59	391	47.98	0.50
5	316	242	26	21	38.77	0.25
6	265	66	366	118	32.52	0.13
7	32	62	0	722	88.59	0.14
8	597	72	45	101	73.25	0.29
9	89	58	618	50	75.83	0.14
10	347	302	57	108	37.06	0.34
11	93	92	424	205	88.59	0.00
12	76	73	126	539	66.13	0.35
13	326	389	66	33	40.00	0.30
14	4	788	19	4	96.69	0.08
15	121	364	47	282	44.66	0.33
16	39	379	362	34	46.50	0.30
17	568	22	45	180	69.69	0.33
18	32	693	61	29	85.03	0.22
19	97	6	693	19	85.03	0.19
20	49	537	225	4	65.89	0.12
21	32	348	343	91	42.70	0.30
22	66	220	347	181	42.58	0.22
23	123	638	33	20	78.28	0.32
24	292	31	194	298	36.56	0.29
25	388	261	82	84	47.61	0.51
26	34	133	459	189	79.51	0.18
27	610	22	62	121	74.85	0.29
28	100	336	290	89	41.24	0.27
29	49	74	31	651	81.10	0.29
30	142	109	519	45	63.68	0.44
31	109	480	110	116	58.90	0.21
32	107	188	485	34	59.51	0.29
33	155	52	111	497	60.98	0.33
34	207	285	220	100	25.40	0.35
35	77	45	647	6	79.39	0.20
36	88	597	24	105	73.25	0.39
37	56	556	65	138	68.22	0.22
38	47	14	735	18	90.19	0.10
39	22	34	341	418	93.13	0.12
40	341	159	56	259	31.78	0.40

## Further comments

In terms of comments on specific questions - one comment was that question 8 was *“a bit unfair for Southern hemisphere students”*.

8. Which type of material is least likely to be able to be recycled economically?

- A. Composite
- B. Glass
- C. Metal
- D. Thermoplastic.

It is not clear to the examining team why this question would be unfair for Southern hemisphere students. The statistics suggest that it was a fairly easy question (difficulty index 73.25) and reasonably discriminating (discrimination index 0.29).

Another comment was that *“Qu 27 Picture was confusing to students”*. There is no picture with question 27. Whatever prompted the comment, with a difficulty index of 74.85 and a discrimination index of 0.31 this was a fairly easy but reasonably discriminating question for candidates, and did not pose any particular problems.

A final comment was that: *“There are a lot of questions using confusing negatives - what is “not” facilitated. This can be quite confusing for a second language English student and more than half the questions are formatted this way. I am not entirely sure of the benefit of this”*. This comment is not entirely fair - five questions can be seen as potentially negative – 8, 22, 25, 31 and 35 which is nowhere near half and certainly not more than half! The difficulty indices and discrimination indices for these questions (see below) suggest that these questions did not pose problems for candidates.

	<b>Difficulty index</b>	<b>Discrimination index</b>
8	73.25	0.29
22	42.58	0.22
25	47.61	0.51
31	58.90	0.21
35	79.39	0.20

Working from this evidence we went through question by question starting with question 15 which had a negative discrimination index (-0.03). No specific G2 comments were received but a negative

discrimination index suggests that there is something odd about the question. The correct response was marked up as A; however, on a second look response B - which was the most popular student response - seemed more appropriate and was corrected. Rerunning the statistics with B as the correct response gave a difficulty index of 44.66 and a discrimination index of 0.33.

We then looked at other questions where the most popular student response differed from the markscheme and found questions 11, 26 and 39. Rerunning question 11 and accepting responses A, C and D as correct resulted in a difficulty index of 88.59 and a discrimination index of 0.00 for question 11; a difficulty index of 79.51 and a discrimination index of 0.18 for question 26 and a difficulty index of 93.13 and a discrimination index of 0.12 for question 39.

## Standard level paper one

## Component grade boundaries

<b>Grade:</b>	1	2	3	4	5	6	7
<b>Mark range:</b>	0 - 7	8 - 11	12 - 16	17 - 18	19 - 20	21 - 22	23 - 30

## Comments

At the Grade Award as for the Higher Level we received the following analysis of the students' responses to the Standard Level Paper 1 in question order:

	A	B	C	D	Difficulty index	Discrimination index
1	9	658	41	1	92.42	0.16
2	424	85	98	200	59.55	0.21
3	173	417	54	65	58.57	0.22
4	42	29	377	261	52.95	0.56
5	634	63	2	10	89.04	0.21
6	235	220	226	28	33.01	0.35
7	220	73	308	107	30.90	0.07
8	232	65	154	257	32.58	0.05
9	33	61	4	611	85.81	0.16
20	439	88	45	137	61.66	0.38
11	120	48	229	312	32.16	0.21
12	168	70	118	352	49.44	0.38
13	90	72	519	26	72.89	0.25
14	654	3	44	7	91.85	0.19
15	341	177	87	104	24.86	0.31
16	113	151	83	361	50.70	0.41
17	112	87	356	154	87.36	0.06
18	46	125	126	412	57.87	0.42
19	88	82	164	375	52.67	0.49
20	22	35	595	57	83.57	0.29
21	139	307	33	230	43.12	0.33
22	37	374	267	30	52.53	0.20
23	26	286	340	57	47.75	0.22
24	57	555	66	3	77.95	0.24
25	41	476	192	0	66.85	0.08
26	73	406	27	203	57.02	0.27
27	35	549	84	41	77.11	0.16
28	110	83	459	57	64.47	0.26
29	106	146	336	121	16.99	0.16
30	358	180	127	43	50.28	0.45

This year the candidature was 712 down very slightly on the previous year's candidature of 718 students. Average performance was on a par with the previous year and the average mark was down by 1.3 from 18.47 in 2013 to 17.17 in 2014.

We received 13 G2s – thanks!!. As mentioned in the Higher Level comments, the examining team really appreciates any comments it receives and the G2s are carefully scrutinised in the Grade Award. We have to assume that people are reasonably happy if they do not comment – this may be an erroneous assumption. **Please, please, please take the opportunity to submit comments. Positive comments are as useful as negative ones.**

All 13 G2s described the difficulty of the paper as appropriate. One thought that it was of a little easier than the previous year, nine thought it was of a similar standard and two thought it was a little more difficult. One (presumably from a new school) said not applicable.

In terms of clarity of working: no one thought it was very poor; no one thought it was poor or fair, two thought it was fair, nine thought it was good and two thought it was very good and two thought it was excellent.

In terms of presentation of the paper: one respondent thought it was very poor, no one thought it was poor or fair; one thought it was very good; six thought it was good; five thought it was very good; two thought it was excellent.

In terms of accessibility and cultural/religious/ethnic bias, respondents were asked to respond to four statements based on their level of agreement with each statement on a six-point Likert scale from strongly disagree = 1 to strongly agree = 6 as explained below:

One G2 commented that: "on the multiple choice had no answers to choose from". The question had the letters A, B, C and D on a map of the world.

One G2 commented on Question 15, i.e. that: "*Plasticity is not in the guide*". Topic four requires an understanding of plastic deformation. One cannot understand about plastic deformation without understanding about plasticity.

Another G2 commented that: "*question 21 on the multiple choice had no answers to choose from*". This is not true – there were answers on the paper.

One G2 commented that: "*The questions were generally good but there are still some issues with the wording. Also some questions are very polarised to specific areas of the world*". I am not sure what this comment relates to without an example. The examining team does try to ensure that there is no bias and to pick contexts which are accessible to young people globally.

One G2 comment said of Question 21: "*Based on the information supplied it was not clear if a portion of the process could have been automated*". The photograph shows a car being moved through the factory on an gantry with an operative using a hand tool (mechanisation). The stem explains that the Ferrari is produced to individual customer specifications (mass customization).

In relation to Question 22, one G2 said it was: "*unclear if the dash represents a minus (subtraction) or a hyphen*". It meant a subtraction. Although it was a harder question for candidates and was reasonably discriminating but not negatively so.

One G2 general comment was: *“Please move to an Electronic online paper format and save paper. Vary the next question based on the success or not on the prior(s). Otherwise, reduce white space and number of pages”*. The white space is an IB formatting issue – the Subject Manager will see this comment and is well placed to pass it on to the Examination Paper Preparation Department (EPPD) who are responsible for this aspect of the IB’s work. We have already tried to build on the experience (and success) of previous sessions.

As a woman, I found the following G2 comment particularly perplexing and worrying in today’s equal opportunities/post gender stereotyping world: *“Ferrari cars and Brio style trains are not particularly encouraging or positive selections for women. And no, I do not think “pink” toys should be shown either”*. I would love a red Ferrari but am never likely to have one – too expensive to buy and run for someone on my pay grade. I thought the Brio trainset my son had was one of the most interesting and tactile toys he had – it was certainly enjoyed by little girls who were his friends and came to our house as much as by little boys. I am sorry but I just don’t understand the comment about pink toys – I don’t think there were any pink toys on the paper!!!

Another G2 general comment was that: *“All questions were suitable”*. Good, thanks for the positive comment! Appreciated.

## Higher level paper two

### Component grade boundaries

<b>Grade:</b>	1	2	3	4	5	6	7
<b>Mark range:</b>	0 - 6	7 - 13	14 - 19	20 - 26	27 - 33	34 - 40	41 - 60

### The areas of the programme and examination which appeared difficult for the candidates

The most prominent area of difficulty was with extended response questions i.e. question (c) (ii) in Section B of Paper Two and the six and nine mark questions in the Option Paper (Three). Although candidates felt able to attempt these questions they rarely scored high marks as responses lacked clarity and precision. These type of questions are set to help differentiate between ability levels and the style of the questions are linked closely to the grade descriptors so when grade boundaries are set evidence from the marking of these questions is used to decide on the boundaries though taking into account teachers' comments as to the perceived standard of the paper. Some candidates struggled with the data based question in Paper Two (question one in Section A). This question too is linked to aspects of the grade descriptors and candidates need to be familiar with the format of the question as part of their preparation for the examination.

### The areas of the programme and examination in which candidates appeared well prepared

It was pleasing to note the improvement in the standard of the practical work presented for moderation indicating that many teachers have well devised Practical Schemes of Work which allow students to demonstrate their ability and provide students with a good grounding in the use of the design process prior to undertaking the Design Project. Teachers will be able to adapt a Scheme of Work to the requirements of the new syllabus (first examination May 2016) with the Design Project the focus of the moderation procedure but investigations leading to the Project will be important for preparing students adequately even though the investigations do not form part of the final assessment.

The majority of students were able to show that they had followed the course programme assiduously and in the process had accumulated considerable knowledge of the topics they had been taught. As indicated above, it was disappointing that they were not always able to capitalize on that knowledge with extended response questions.

## Individual question analysis

1.
  - (a)
    - (i) This proved to be an easy question for almost all candidates.
    - (ii) This question was not answered well overall – candidates did not focus on the current design of the case rather than future developments that is required to answer part (iii).
    - (iii) Most candidates managed to achieve one mark for this question by referring to the iPod but not many candidates described the benefit of the development.
  - (b)
    - (i) This was a straightforward question for nearly all candidates.
    - (ii) This question was not answered correctly by many candidates – “materials” was identified rather than materials research as part of the research and development phase. The concept of “fixed costs” was not well understood.
  - (c)
    - (i) This question was fine for those candidates who thought carefully about the nature of the test but surprisingly few candidates did that.
    - (ii) Not many candidates fully comprehended the meaning of the question – perhaps the wording was not precise enough? Most candidates managed to achieve one or possibly two marks though responses needed to be carefully worded to gain all three marks.
  - (d) Both parts of the question were answered well by the majority of candidates.
  - (e)
    - (i) Most candidates considered the potential for fingers/skin getting trapped when fitting the case.
    - (ii) This question required candidates to focus on the data in Table 2 i.e. the case needs to be a tight fit so dexterity is required which may be a problem for some users.
2. Part (a) was answered quite well and most candidates made a good attempt at part (b) but few gained all three available marks as they did not structure their response to focus on **one** advantage and ensure that three distinct points were made (as indicated in the markscheme).
3. Part (a) proved to be problematic for many candidates who did not appreciate that thermoplastic materials are used in the blow – moulding process but part (b) was a relatively easy question for most candidates.
4. Part (a) was not straightforward for many candidates as they needed to think carefully about the nature of the product and the fact that it is in the early stage of adoption. For part (b) candidates had little problem thinking of a suitable limitation but not many gained three marks for considering **one** limitation in sufficient detail.

5. Most candidates who were familiar with stress/strain graphs were able to identify the correct material for part (a) and briefly describe why it was appropriate. Few candidates identified material 'B' as the correct answer for part (b) as they needed to recognize that for stiffness (Young's Modulus) the material that produces the smallest strain for a particular stress in the elastic region is the stiffest i.e. the steeper the slope of the elastic line, the higher is the Young's Modulus.
6. For part (a) many candidates confused "green design" with "clean technology" though for part (b) nearly all candidates understood the concept of an incremental approach and were able to transfer their knowledge of radical and incremental design to the context of adopting clean technology

## Section B

The questions seemed quite accessible and provided choice for candidates. The most popular question was Q9 closely followed by Q7 and then Q8. The nine mark questions (cii) for all three questions in Section B were not answered particularly well by the majority of candidates who did not think carefully enough about the links between the three aspects of the design context and how their answer would be differentiated. If candidates spent more time reading through their draft answers to these extended response questions they would identify repetition. Some candidates probably chose the wrong question as they found the design context appealing but did not work through their answers to each sub-part before making their choice.

7. (a) (i) Nearly all candidates were able to identify a suitable reason for the rubber feet but many did not plan their answers effectively enough to **outline** the reason rather than just state it.
- (ii) Most candidates understood the property of density but did not consider the context indicated in the stem of the question carefully enough to focus on 'light enough to be carried'.
- (b) (i) Many candidates understood that non – ferrous metals do not rust but not many achieved both available marks by considering that the ladders are likely to be used outside (as shown).
- (ii) This proved to be a difficult question. Candidates needed to understand the concepts of quality control and quality assurance and relate quality control measures to the provision of a lengthy guarantee so the manufacturer must be confident of the quality of the product.
- (c) (i) Most candidates were able to identify a suitable component though not all "outlined" the choice.
- (ii) Although all candidates felt able to answer the question not many responses were suitable planned to identify **three** considerations relating to external loading with three distinct points being made for each consideration (as shown in the markscheme). Many answers contained vague references to suitable

external loads with much repetition prevalent.

8. (a) (i) Although many candidates correctly identified the technique for joining the components they did not gain the second mark for an **outline**.
- (ii) Similar to (i) above, the majority of candidates focused on extrusion but many responses were too vague to gain both available marks.
- (b) (i) Some candidates interpreted “maintenance” to mean repair rather than conditions of use.
- (ii) Most candidates were able to successfully link the concept of product development to a design family for the stools.
- (c) (i) Candidates needed to read the question carefully and focus on the context of a family home with a link to the potential dangers of the product for young children.
- (ii) The three properties stated in the stem of the question were well understood by nearly all candidates so it was disappointing that so few candidates gained more than 50% of the available marks. It was clear that most candidates wrote their response quickly “off the top of their head” resulting in much ambiguity and repetition in the answers.
9. (a) (i) This proved to be an easy question for candidates.
- (ii) Nearly all candidates gained at least one mark for relating daylight to energy consumption but many candidates did not go on to make the link to the concept of a low carbon house by the reduction of fossil fuel burning.
- (b) (i) This was a straightforward question for most candidates.
- (ii) The majority of candidates understood the nature of the technology represented by the clay blocks and those candidates who structured their response to make three distinct points were able to gain maximum marks.
- (c) (i) The key term in the question is ‘cost – effective’ so candidates needed to consider the sheep’s wool as an available resource and at a low cost due to the lack of processing of the material/quality of the fleece.
- (ii) Nearly all candidates correctly identified the three categories of *triple bottom line sustainability* so it was surprising that so few gained high marks for the question. Candidates needed to tease out distinct points for each category relating to the concept of the ‘Natural House’ rather than making a generalised response with much repetition.

## Recommendations and guidance for the teaching of future candidates

- Question one parts (a), (b) and (c) relate to the initial data and context described. The second piece of data should be viewed as an extension of the initial data and context rather than totally separate. Parts (d) and (e) may just refer to aspects of the second piece of data or to aspects of both the first and second pieces.
- Candidates should recognize the nature of the command term for each question and the type of response required based on the marks available. It is clear that many candidates have the knowledge to gain full marks for a question but do not provide enough detail or plan their response appropriately to make the most of their knowledge.
- When a question asks to *outline one advantage* candidates need to ensure that only one advantage is identified but the response provides a *brief explanation* as to why the advantage is appropriate. Candidates will not be credited with the two available marks for stating **two** correct advantages but not *outlining* either of them.
- Candidates should be encouraged to use past papers and markschemes to become familiar with the way in which nine mark questions are structured and how the marks are 'clustered' on the markscheme so that three marks are available for each aspect but to gain all three marks candidates need to provide an *explanation, discussion, suggestion* etc. with three distinct points made and all suitable linked to the given context. Typically, the three points will refer to correctly identifying an issue, describing it and explaining the relevance to the context e.g. 'safety', what the safety measure is and why it is relevant in the context given or the extent of its relevance.

## Standard level paper two

### Component grade boundaries

<b>Grade:</b>	1	2	3	4	5	6	7
<b>Mark range:</b>	0 - 4	5 - 8	9 - 12	13 - 16	17 - 20	21 - 24	25 - 40

## Individual question analysis

### Section A

#### Question 1

- (a) (i)&(ii) The majority of the candidates were able to extricate the relevant data from the stem to answer this question correctly with most stating that carbon fibre composite has a high strength to weight ration.
- (iii) Many students were awarded one mark here for stating that composite materials are designed for specific purposes, but a limited amount was able to attain the second mark.
- (b) (i) Many students were able to recognize that the toe shape affects balance/grip, but few gained the additional mark.
- (ii) Many students mixed up the answers for (b) (i) and (ii), stating that the tread plate is customized as it affects balance/grip. Those that did state that it was related to the different types of surfaces in competitions tended to get both marks.
- (c) (i) This question was answered well by most candidates.
- (ii) Students were able to make the link that the thickness of the blade affects its stiffness and that different body weights require different thicknesses of the blade, but few were awarded all three marks.

#### Question 2

- (a) Many students answered this question correctly.
- (b) Many students wrote that by the age of 19 most people have reached maturity and no longer grow and also that after 65 people reduce in stature. Few explained why there is this reduction.

**Question 3**

- (a) Many students simply stated that this meant that a product has a 'life' without relating it to a conscious act of incorporating new technology and safety factors into later versions.
- (b) This was a difficult question for students with many being too vague or simply off course.

It is important that centres advise their students that Questions 2 and 3 are not related to Question 1 as many were still including in their answers information concerning the Cheetah blade.

**Section B**

There was a reasonable spread of choices between the tree questions, although Question 4 was the most popular followed by Question 6 and then Question 5.

**Question 4**

- (a) (i) Most candidates answered this correctly.
- (ii) Most students were able to give the reason that the name suggests a private (secret) place, but were unable to gain the 2 marks.
- (iii) Few candidates were able to state that the type of production system was craft with many students stating '*batch*'.
- (b) (i) Most students answered this question correctly.
- (ii) Many students responded that stability was an issue and were able to explain why. Many students mixed up responses from triplets and therefore, were unable to gain all 3 marks.
- (c) (i) Candidates understood that different weather condition was a issue for a piece of outdoor furniture but failed to explain fully to get the 3 marks. Very few provided an alternative response.
- (ii) This question proved difficult for most students to attain high marks. It highlighted the point that these questions need to be clearly structured into three defined aspects in order to avoid vagueness and repetition. Most student responses failed to do this.

**Question 5**

- (a) (i) Most candidates answered this correctly.
- (ii) Many candidates were able to define what market pull and technology push is, but many did not relate it to the context of the question.
- (iii) The majority of candidates answered this correctly
- (b) (i) Injection moulding was the response awarded the mark and not simply moulding.
- (ii) Once again students need to relate their response to the context of the question and not to simply provide a definition.
- (c) (i) This question was answered well with a range of students being able to suggest that colours and/or trends influenced the design of the frisbee.
- (ii) If the response to this question was carefully planned it was possible for students to score well on this question. In fact, students performed best on this 9-mark question. Many were able to discuss points related to science and technology, but dropped marks when discussing design related points.

**Question 6**

- (a) (i) Most candidates answered this question correctly.
- (ii) Many students were able to score 1 mark, but explanations lacked clarity.
- (iii) Many students were able to recognize that the seat cover would become dirty, but the explanations lacked clarity.
- (b) (i) Few students were able to state texture or words to that effect.
- (ii) This proved to be a difficult question. Many students wrote about the product cycle rather than the life cycle.
- (c) (i) Candidates were able to recognize that moisture would be accumulated over long periods of time, but explanations of this point lacked clarity.
- (ii) Many candidates' responses were generic and failed to relate to the context. Definitions of user trials, field trials and performance trials did not score marks. The better candidates did do well on this question.

## Recommendations and guidance for the teaching of future candidates

At times students' examination technique let that down rather than their lack of knowledge. It is essential that they are able to assimilate knowledge and relate it directly to the appropriate design context within the questions rather than just regurgitating facts.

Candidates should be made more familiar with the meaning of the command terms used at the start of each question and which relate to Assessment Statements in the Subject Guide. Students are failing to maximize marks because of this.

In order to generate well developed answers and thus gain high marks, students should have the opportunity to practice answering questions; especially the three and nine mark questions. Well structured responses are clearly focused on the design context and draw on key aspects provide in the stem of the question.

## Higher level paper three

### Component grade boundaries

<b>Grade:</b>	1	2	3	4	5	6	7
<b>Mark range:</b>	0 - 3	4 - 7	8 - 12	13 - 18	19 - 25	26 - 31	32 - 40

### The areas of the programme and examination which appeared difficult for the candidates

Teachers are reminded that many candidates are not structuring the longer responses in a manner that allows them to secure the higher marks available. The stem of the question is often not responded to in terms of the number of issues to be visited or the depth required to be awarded the three marks allocated.

It should also be noted that 'bullet point' answers are often not satisfactory for answers that are worth more than one mark.

Handwriting is becoming an issue for many candidates, with some responses being almost impossible to decipher.

### The areas of the programme and examination in which candidates appeared well prepared

There was a noticeable increase in the use of prose when answering questions, rather than single words or bullet points.

The knowledge base within each topic also appears to be wider, in that there were fewer 'no responses' given to questions.

## The strengths and weaknesses of the candidates in the treatment of individual questions

### Option A

This option is becoming less popular with far fewer candidates this session.

Candidates still seem to lack an understanding of the more technical aspects of food science and technology which are identified in the Guide.

1. (a) This question posed few problems for most candidates but some candidates ignored word 'advice'

The majority of candidates were able to offer at least one nutritional benefit. However, there was a lack of the correct terminology in many cases.
- (c) This question was understood by most candidates but poor response structure limited the marks in many cases.
2. (a) The definition of 'undernourishment' was not known by the vast majority of candidates.
- (b) Too many candidates misinterpreted 'food security' as 'prevention from spoiling'.
3. (a) Once again, the lack of a technical response limited many candidates to one mark.
- (b) The 'Maillard reaction' was not well known, with many candidates just referring to 'burning'.
4. This question on how packaging contributes to the developments of brands was not always understood, with many candidates discussing the purpose of packaging, such as protection, without reference to brand development.
5. (a) Generally well answered.
- (b) Many candidates repeated the previous answer, failing to focus on US consumers.
- (c) This was poorly answered as many candidates appeared not to understand the meaning of 'ethical'.
6. This question focused on food contamination. It is clear that some candidates are not able to distinguish between food contamination and food quality.
  - (a) The majority of candidates were able to explain a way that contamination could be minimised, but their responses lacked the required depth for three marks.
  - (b) Most candidates failed to refer to the temperature that the food was stored at and did not discuss the temperature danger zone.

7. This question required candidates to explain three ways a developed country's food industry operates as a tightly controlled JIT system. A disappointingly high number of candidates referred to 'developing' countries, whilst many more discussed the serving of food in a restaurant. Those candidates who did respond to the question as set, often failed to structure their response to clearly explain three ways without significant repetition.

## Option B

Option B is not a popular option and is attempted by very few schools/candidates.

8. (a) Generally well answered.  
(b) Generally well answered.  
(c) The third part of the question required candidates to explain why the system uses negative feedback. Many candidates could not explain that the negative feedback would stabilise the system.
9. (a) Virtual reality was well understood by most candidates.  
(b) Similarly, most candidates could outline a relevant design consideration.
10. (a) Many candidates described a generic music system rather than outlining the advantage to the consumer of the compatibility between the devices/systems.  
(b) Most candidates were able to outline an advantage for the manufacturer but too often failed to develop their answer for two marks.
11. This question was about products being designed to operate at dual voltages. Once again, it was the lack of structure to the responses and repetition, rather than technical knowledge that prevented candidates accessing the higher mark ranges.
12. (a) The annotation of the circuit diagram was poorly done.  
(b) The characteristics of PICs were well known  
(c) Most candidates were able to suggest a motor to open and close the blind.
13. (a) This question was generally well answered.  
(b) Many candidates failed to structure their response in a manner to obtain three marks. They often stated a way in which the pace of innovation had increased, but did not explain how the design of electronic products had contributed.
14. The final question in this option was worth 9 marks and required an explanation of three advantages of using PICs when developing hearing aids. The majority of candidates were able to state three advantages but, once again, the structure of many responses lacked clarity and depth with elements of repetition.

## Option C

Option C is the second most popular option.

15. (a) Generally well answered but some candidates ignored the fact that it is a single block of metal.
- (b) The purpose of the 5 axis machine was well known but many candidates failed to mention that the model did not need repositioning.
- (c) Those candidates who answered the question as a CAD simulation did well. However, many answered it as a CAM simulation.
16. (a) Well answered.
- (b) Too many candidates assumed that it was for prototype manufacture.
17. (a) This was basically well known but many candidates did not give the required depth for two marks.
- (b) The process of SLS was not widely understood.
18. This question required an explanation of two impacts of introducing CNC machines on the fixed and variable costs of a multinational company. There was some confusion as to which costs were variable or fixed. The markscheme allowed for some variance as long as the context was made clear. Repetition was prevalent within many responses, limiting the award of the higher mark ranges.
19. (a)&(b) As in a previous question, there was some confusion between CAD & CAM. This was further exacerbated by confusion between copyright and patents. Few candidates were able to clearly respond to the two parts and gain the four marks available.
- (c) The majority understood this element and were able to gain at least one mark.
20. (a) This question was answered well by many candidates, although lack of depth restricted most to two marks.
- (b) Most candidates referred to the 'isolation' of workers rather than the wider social disadvantages.
21. This question asked for a discussion of issues when using natural timber to produce furniture with CNC equipment. This question posed few problems apart from the issue of depth of response. However, a significant number of candidates referred to producing furniture from a single, large block of timber.

## Option D – Textiles

This is not a very popular option, with fewer numbers this session.

22. (a) Well understood.
- (b) Generally well know but not always well explained.
- (c) The majority of candidates understood the advantage but their explanation lacked depth.
23. (a) Most candidates basically knew the answer but some found it difficult to explain.
- (b) The technicalities of the fabric were not well known.
24. (a) Well answered by the majority of candidates.
- (b) Once again, the technical reasons were not fully understood.
25. This six-mark question required an explanation of two considerations in relation to biocompatibility of textile vascular prostheses. Many candidates had a basic understand but failed to formulate their responses clearly and with enough depth to gain the higher mark ranges.
26. (a) This was generally well answered.
- (b) This was also well know and explained.
- (c) The advantage of the Global Organic Textile Standard was far less well understood by candidates.
27. (a)&(b) There was real confusion among some candidates between the two parts of this question, with many mixing up the two answers. Many did not apparently understand the term 'human resource management' and concentrated on exploitation. More were able to discuss a disadvantage to a developing country but not in any depth.
28. The question required an explanation of three ways branding of textiles contributes to a global marketing strategy. Whilst candidates had some real understanding of what a brand meant, most found it difficult to formulate a response addressing three aspects without repetition. This severely limited the mark ranges available to them.

## Option E — Human factors design

This is by far the most popular option.

29. (a) Well answered and understood.
- (b) Candidates clearly knew the reason but many failed to expand their answer to achieve the second mark.
- (c) Once again, the understanding was apparent but repetition limited the marks awarded.
30. (a) Physio-pleasure was not well known.
- (b) Apart from the significant number of candidates who misread the question as ‘technophobes’, this was well answered.
31. (a) Undeveloped answers limited many candidates to one mark.
- (b) Many answers were actually comments on ‘bad design’ of mobile phones rather than why the motor processing stages lead to errors in writing a response.
32. This question asked for two reasons why dimensions in anthropometric tables are stated as estimates. Whilst many candidates understood such factors as errors in measurement, ethnicity, rounding up etc, most was unable to formulate a clear response covering two reasons to a depth required to gain the higher mark ranges.
33. (a) This question was generally well answered.
- (b) This was also well answered by most candidates, but some did not achieve the second mark for lack of clarity.
- (c) Many candidates did not refer to the ability to carry out multiple design iterations in less time than a user trial.
34. (a) This question was not well answered as many candidates ignored the aspect of ‘cultural’ differences, failing to mention such aspects as religion, country of origin or socio-economic class divisions.
- (b) A significant number of candidates misinterpreted this question and discussed how designers researched the problem rather than how they took account of different attitudes to personal space in the layout of the furniture in a café. Those who responded correctly produced some creditworthy answers.
- E7 This question required the discussion of the human factor considerations in the design of a car seat belt. Most candidates were able to respond with factors relating to anthropometrics, psychology and physiology. However, the structuring of the responses often lacked clarity and depth.

## Recommendations and guidance for the teaching of future candidates

Some candidates do not appear to possess the necessary technical vocabulary to access the full mark range, often resorting to generic description of materials. This is also true of many of the processes that are significant to each option.

Candidates should be advised not to repeat the stem of the question in their answer. Not only does this waste time in the examination, it takes up too much of the space allowed and seems to give them a false impression that they have answered part of the question by doing so.

Candidates should be urged to take more time over reading the stem and the key requirements contained within the body of the question. Too often marks are lost by, for instance, only giving one example rather than the required two.

They are also advised to check that they haven't repeated an element of an answer, even though they have written it in a different form, expecting to be credited twice.

One hint that candidates can take on board is that if they find themselves writing virtually the same answer to two separate parts of a linked question, then it is likely that they have misread one of them.

Candidates are also advised to concentrate on the preparation for the 6 and 9 mark questions. These are effectively made up of 2 x 3 marks and 3 x 3 marks. Repetition is a common problem here, as is lack of depth of response, often due to lack of technical knowledge and vocabulary.

An increasing problem is the relentless deterioration in the quality of handwriting. Some responses have almost been impossible to decipher. Candidates should be advised to take their time when writing their responses in order to make them legible.

A further point with respect to this is the choice of writing implement. Candidates are strongly advised not to use felt-tip pens or anything that does not produce a clear and clean presentation.

## Standard level paper three

### Component grade boundaries

<b>Grade:</b>	1	2	3	4	5	6	7
<b>Mark range:</b>	0 - 3	4 - 7	8 - 10	11 - 14	15 - 18	19 - 22	23 - 30

### The areas of the programme and examination which appeared difficult for the candidates

Teachers are reminded that many candidates are not structuring the longer responses in a manner that allows them to secure the higher marks available. The stem of the question is often not responded to in terms of the number of issues to be visited or the depth required to be awarded, particularly when three marks have been allocated.

It should also be noted that 'bullet point' answers are often not satisfactory for answers that are worth more than one mark.

Handwriting is becoming an issue for many candidates, with some responses being almost impossible to decipher.

Many candidates did not constrain their answers to the boxes indicated on the paper. Teachers should note that we now mark electronically from scanned material. Anything outside the box may not be seen by an examiner.

### The areas of the programme and examination in which candidates appeared well prepared

There was a noticeable increase in the use of prose when answering questions, rather than single words or bullet points. Many candidates, particularly the higher performing ones are using better structured answers, identifying distinct points in line with the mark location for the question. We continue to use command terms and mark allocation to indicate the level of response expected from candidates

The knowledge base within each topic also appears to be wider, in that there were fewer 'no responses' given to questions.

## The strengths and weaknesses of the candidates in the treatment of individual questions

### Option A

This option is becoming less popular with far fewer candidates attempting it this session. Candidates still seem to lack understanding of the more technical aspects of food science and technology which are identified in the Guide.

1.
  - (a) This question posed few problems for most candidates but some candidates ignored the word 'advice'.
  - (b) The majority of candidates were able to offer at least one nutritional benefit. However, there was a lack of the correct terminology in many cases.
  - (c) This question was understood by most candidates but poor response structure limited the marks in many cases.
2.
  - (a) Many students seemed to have no idea about the term 'biological value'.
  - (b) Many students failed to describe how low biological foods are complemented in different parts of the world to ensure that amino acid requirements are met. This emphasises the lack of technical knowledge about food by students in some schools.
3.
  - (a) Once again, the lack of a technical response limited many candidates to one mark.
  - (b) The 'Maillard reaction' was not well known, with many candidates just referring to 'burning'.
4. This question asked candidates to outline one function of primary food packaging. Candidates seemed to either know or not and achieved 0 or 2 marks accordingly.
5. This question on how packaging contributes to the development of brands was not always understood, with many candidates discussing the purpose of packaging, such as protection, without reference to brand development.
6. This question required candidates to explain three ways a developed country's food industry operates as a tightly controlled JIT system. A disappointingly high number of candidates referred to 'developing' countries, whilst many more discussed the serving of food in a restaurant. Those candidates who did respond to the question as set, often failed to structure their response to clearly explain three ways without significant repetition.

## Option B

Option B was not a popular option and was attempted by very few schools/candidates at Standard level.

7. (a) Reasonably well answered.
- (b) Reasonably well answered.
- (c) The third part of the question required candidates to explain why the system used negative feedback. Many candidates could not explain that the negative feedback would stabilise the system.
8. (a) A small number of candidates recognised inverting op-ap circuit.
- (b) This question was problematic and as pointed out on one G2: “The output voltage cannot be calculated if  $V_{in}$  is not provided, which it isnt! Only the gain can be calculated with the given resistor values”. The markscheme was adjusted to overcome this issue so that candidates were not disadvantaged.
9. (a) Many candidates described a generic music system rather than outlining the advantage to the consumer of the compatibility between devices/systems.
- (b) Most candidates were able to outline an advantage for the manufacturer but too often failed to develop their answer for two marks.
10. This question seemed very straightforward but was very poorly answered by candidates who just seemed to have no idea.
11. This question was about products being designed to operate at dual voltages. Once again, there was the lack of structure to the responses and repetition, rather than technical knowledge that prevented candidates accessing the higher mark ranges.
12. The final question in this option was worth 9 marks and required an explanation of three advantages of using PICs when developing hearing aids. The majority of candidates were able to state three advantages but, once again, the structure of many responses lacked clarity and depth with elements of repetition.

## Option C

As in previous years, Option C was the second most popular option.

13. (a) Generally well answered but some candidates ignored the fact that it is a single block of metal.
- (b) The purpose of the five-axis machine was clearly well understood. All but the weakest candidates mentioned undercuts but many candidates failed to mention that the model did not need repositioning.
- (c) Those candidates who answered the question as a CAD simulation did well. However, many answered it as a CAM simulation.
14. (a) Well answered most candidates were able to provide a reasonable definition of motion capture technology.
- (b) Most candidates were able to explain how motion capture technology would assist in the design development of car interiors.
15. (a) This was basically well known but many candidates did not give the required clarity or depth for two marks.
- (b) The process of SLS was not widely understood.
16. Reasonably answered by many candidates.
17. Many candidates were able to relate the impacts of introducing CNC machines on the fixed and variable costs of a company.
18. This question asked for a discussion of issues when using natural timber to produce furniture with CNC equipment. This question posed few problems apart from the issue of depth of response. However, a significant number of candidates referred to producing furniture from a single, large block of timber.

## Option D – Textiles

This is not a very popular option, with even fewer numbers this session.

19. (a) Well understood
- (b) Generally well known but not always well explained.
- (c) The majority of candidates understood the advantage but their explanations lacked depth.
20. (a) Most candidates basically knew the answer but some found it difficult to explain.
- (b) The link between CAD and CAM in mass customisation seemed to a major problem for many candidates.
21. (a) Well answered by the majority of candidates.
- (b) Once again, the technical reasons were not fully understood.
22. This straightforward question was very poorly answered by candidates.
23. This six-mark question required an explanation of two considerations in relation to biocompatibility of textile vascular prostheses. Many candidates had a basic understand but failed to formulate their responses clearly and with enough depth to gain the higher mark ranges.
24. The nine-mark question required an explanation of three ways branding of textiles contributes to a global marketing strategy. Whilst candidates had some real understanding of what a brand meant, most found it difficult to formulate a response addressing three aspects without repetition. This severely limited the mark ranges available to them.

## Option E — Human factors design

This was by far the most popular option.

25. (a) Well answered and understood.
- (b) Candidates clearly knew the reason but many failed to expand their answer to achieve the second mark.
- (c) Once again, the understanding was apparent but repetition limited the marks awarded.
26. (a) The answer was ordinal. A wide variety of incorrect alternative (wrong) answers were offered.
- (b) Answers often did not adopt a manufacturing perspective.
27. (a) Undeveloped answers limited many candidates to one mark.
- (b) Many answers were actually comments on 'bad design' of mobile phones rather than why the motor processing stages lead to errors in writing a response.
28. This was generally well-answered.
29. This question asked for two reasons why dimensions in anthropometric tables are stated as estimates. Whilst many candidates understood such factors as errors in measurement, ethnicity, rounding up etc, most were unable to formulate a clear response covering two reasons to a depth required to gain good marks.
30. This question required the discussion of the human factor considerations in the design of a car seat belt. Most candidates were able to respond with factors relating to anthropometrics, psychology and physiology. However, the structuring of the responses often lacked clarity and depth.

## Recommendations and guidance for the teaching of future candidates

Some candidates do not appear to possess the necessary technical vocabulary to access the full mark range, often resorting to generic description of materials. This is also true of many of the processes that are significant to each option.

Candidates should be advised not to repeat the stem of the question in their answer. Not only does this waste time in the examination, it takes up too much of the space allowed and seems to give them a false impression that they have answered part of the question by doing so.

Candidates should be urged to take more time over reading the stem and the key requirements contained within the body of the question. Too often marks are lost by, for instance, only giving one example rather than the required two.

They are also advised to check that they haven't repeated an element of an answer, even though they have written it in a different form, expecting to be credited twice.

One hint that candidates can take on board is that if they find themselves writing virtually the same answer to two separate parts of a linked question, then it is likely that they have misread one of them.

Candidates are also advised to concentrate on the preparation for the 6 and 9-mark questions. These are effectively made up of 2 x 3 marks and 3 x 3 marks. Repetition is a common problem here, as is lack of depth of response, often due to lack of technical knowledge and vocabulary.

An increasing problem is the relentless deterioration in the quality of handwriting. Some responses have almost been impossible to decipher. Candidates should be advised to take their time when writing their responses in order to make them legible.

A further point with respect to this is the choice of writing implement. Candidates are strongly advised not to use felt-tip pens or anything that does not produce clear and clean marks on the paper.