

Examiners' Report Summer 2007

GCSE

GCSE Manufacturing (2351)

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Chief Examiner's Report

June 2007

There were two qualifications examined in this series at GCSE level.
GCSE Engineering (Double Award) and
GCSE Manufacturing (Double Award)

Unit 3: Application of Technology (5318)

The award of this unit was split into six sectors with an individual paper for each:

5318/01	Printing and Publishing Paper and Board
5318/02	Food & Drink, Biological & Chemical
5318/03	Textiles and Clothing
5318/04	Engineering and Fabrication
5318/05	Electrical and Electronic, Process Control, Computers, Telecommunications
5318/06	Mechanical, Automotive

All six papers were harmonised for structure and difficulty.

Each paper had two sections. Questions in Section A related generally to information about the chosen sector. Section B illustrated a product from the chosen sector and questions were related to that product. The product was pre-released in November 2006 and acted as a focus for research in preparation for the exam. Again this year a Support Paper was available to help centres prepare for the exam. This paper was widely available on the website as a 'stand alone document' and was also attached to the pre-release material so every centre had access to this. It was also attached to this report for last year. Candidates were able to take their own research notes into the examination, but this was not to be submitted with the examination paper for marking.

The question paper within both sections was ramped in difficulty throughout.

All Principal Examiners' reports indicate that all the questions within the respective paper were accessible to their intended candidature, although all indicated that some lower achievers were able to access marks from the later questions in the paper.

Generally speaking those candidates who had had opportunities to study and research the target product answered well. It was clear in their responses that they understood the process of manufacturing/engineering when applied to their product and sector. Good candidates were also able to give variety in their responses across the range of questions.

In general terms a typical grade F candidate was able to identify products from a given sector, name and describe, with some exceptions in some sectors, the use of components/equipment etc and in most cases link applications of technology to key areas of technology. In a range of other questions where explanations and descriptions were required often candidates were only able to give one word if not simple answers. Variations in answers throughout the paper were limited. Application of technology was also limited throughout their responses. Often no responses were suitable for the last question in the paper. They showed limited recall and application of knowledge and understanding.

In general terms a typical grade C candidate was able to gain a range of marks from the same areas and aspects of the paper as a grade F candidate, but with further detail in their responses to those questions demanding an explanation or description. They were able to explain a range of benefits of using communications technology and apply this to compare with traditional approaches. Their responses when explaining the benefits of data handling systems were limited. Good responses were given when explaining the aspects of the product through sketches and notes. Some were still unsure of the stages in manufacture, particularly what happens in the production planning stage. There was a wider range of responses when demonstrating their knowledge of the use of quality control procedures in the production of their product, although many were still limited.

In general terms a typical grade A candidate was able to access marks for many aspects of the paper including most of those achieved by grade C candidates. Their explanations and descriptions were complete and had many references to the "real" manufacturing and application of technology of their product. Their responses when explaining the benefits of CAM and CAD to the distributor and manufacturer respectively were in detail and demonstrated knowledge of advantages. Throughout the papers candidate responses evidenced a variety of application of technology. Many candidates were able to explain the benefits of the use of quality control. Often their evaluations on the effect modern technology has had on workforce, working environment and the global environment were well presented.

The Support Paper that had been prepared for centres is included as appendix 1 of this report. This in turn will be updated and available to help centres prepare for the use of the pre-release material. A 'Revision Guide' is also available and can be found on the SEMTA websites www.gcseinengineering.com and www.gcseinmanufacturing.com.

Comments on individual sectors are given on the next pages.

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Introduction

It was pleasing to note that some centres provided very high quality samples of work that met the requirements of the specifications, moderators reporting a general improvement in the overall standard of work produced. However, it is disappointing to note that a significant number of centres continued to misinterpret the content of the specifications and are not conforming to the procedures laid down by the awarding body. Where ever possible moderators ensured that candidates were not disadvantaged by incorrect procedures, however, where the specification was not interpreted correctly, as identified later in this report, candidates were inevitably disadvantaged. Much of this report reiterates problems identified in last year's report.

The majority of the comment relating to failure to observe general procedures is common to both GCSE Engineering and Manufacturing, suggesting that centres are possibly working to requirements and instructions relating to other qualifications.

Some centres continue to use inappropriate assignments that were not designed specifically to address the assessment criteria of the units within this programme. Many of these assignments reflected a CDT or handicrafts approach which demonstrated little understanding of industrial manufacturing. This practice often resulted in significant disadvantage to candidates.

A significant number of centres did not manage to send work to moderators before the deadline of 15th May '07, and the moderation team endeavoured to deal with late work in order to issue results on time. This caused a significant work load for moderators who tried to ensure that candidates were not disadvantaged by centres inability to conform to Awarding body requirements.

Both of the internally assessed units require candidates to build a portfolio of evidence. Where candidates produced clearly ordered portfolios which grouped evidence to meet individual assessment criteria, assessors' tasks appeared to have been very much simplified and also candidates presented evidence to meet each of the assessment criteria. However, some centres did not develop portfolio building skills and candidates presented collections of ill-defined work. In these cases assessment was frequently not accurate and candidates were assessed incorrectly.

Some moderators reported that it was difficult to reconcile marks awarded by assessors with the evidence provided by the candidates. This may be due to assessors' judgements being formulated in respect to other criteria than those prescribed by the specifications. Centre should recognise that moderators can only recognise achievement where there is clear and auditable evidence to meet the criteria of the relevant units.

Some assessors continue to fail to provide indication of where achievement had been recognised. It is a regulatory body requirement that assessors provide page numbers to indicate where evidence had been recognised. In cases where page numbering was not provided the moderators applied individual judgement to identify where evidence was considered to have been recognised. Sometimes moderators found it necessary to remark work instead of trying to agree assessment decisions. All portfolios should include an annotated Mark Record Sheet and the assessor should ensure that:

- All marks are recorded accurately and the arithmetic is correct
- The total mark is transferred correctly onto the OPTEMS or via EDI
- The candidate and the assessor, as appropriate, sign any required authentication.

Consistent and accurate assessment usually occurred when assessors identified sections of portfolios which met the two different features of each assessment criterion.

It is disappointing to report that some centres failed to record marks accurately, moderators noting that marks recorded on candidate work did not agree with those recorded on OPTEMS forms and also that some centres were not able to provide accurate totals for marks awarded. In these cases moderators sometimes were able to verify appropriate marks by communicating with the centre or assessor individually. However, in some cases it was necessary to use the marks recorded on the Awarding bodies system.

Some centres still did not provide any evidence of Candidate Authentication and moderators spent considerable amounts of time contacting centres in order to obtain the necessary authentication forms. In many cases these forms were not correctly signed either by the candidate or the assessor/teacher. It is a JCQ requirement that all candidate work should be accompanied by a correctly completed Candidate Authentication Sheet as follows:

10 Authentication Procedures

- 10.1 The *Code of Practice* requires all candidates to sign that the work submitted is their own and teachers/assessors to confirm that the work assessed is solely that of the candidate concerned and was conducted under required conditions. All teachers who have assessed the work of any candidate entered for each component must sign the declaration of authentication. Failure to sign the authentication statement may delay the processing of the candidates' results.
- 10.2 The teacher should be sufficiently aware of the candidate's standard and level of work to appreciate if the coursework submitted is beyond the talents of the candidate.
- 10.3 In most centres teachers are familiar with candidates' work through class and homework assignments. Where this is not the case, teachers should require coursework to be completed under direct supervision.
- 10.4 In all cases, some direct supervision is necessary to ensure that the coursework submitted can be confidently authenticated as the candidate's own.
- 10.5 If teachers/assessors have reservations about signing the authentication statements, the following points of guidance should be followed.
 - If it is believed that a candidate has received additional assistance and this is acceptable within the guidelines for the relevant specification, the teacher/assessor should award a mark which represents the candidate's unaided achievement. The authentication statement should be signed and information given on the relevant form.
 - If the teacher/assessor is unable to sign the authentication statement in respect of a particular candidate, then the candidate's work cannot be accepted for assessment. The awarding body will provide instructions as to how work that cannot be accepted for assessment should be recorded on the optical mark sheet or encoded on the EDI file.
 - If malpractice is suspected, the Examinations Officer should be consulted about the procedure to be followed. (See Paragraphs 8.2 and 8.3 above).
- 10.6 Each candidate is also required to sign a declaration confirming that the work is his/her own. This is the centre's responsibility. (See Appendix 1 for further details).

(JCQ Instructions for conducting coursework/portfolios September 2006)

Presentation of Portfolios

JCQ Instructions for conducting coursework/portfolios September 2006 prescribe the content of a candidate's portfolio and it is disappointing to report that a significant number of centres/candidates did not present portfolios in an appropriate manner.

The title page must be in addition to the Mark Record Sheet which does not form part of the portfolio and is removed when the work has been moderated. In many cases work did not carry any means of identification after the Mark Record Sheet had been removed.

All portfolios submitted for assessment must be the candidate's own work. Written material may be handwritten or word processed.

Portfolios must include a title and, where relevant, a table of contents and bibliography. Material included as appendices (such as tables of statistics, diagrams, graphs, illustrations, photographs, maps etc) will be given credit only if it is pertinent to the work and is referred to in the text.

Written work should be submitted in plain covers or folders, together with the cover sheets provided by the awarding body. The cover must be marked clearly with the candidate's name and number, the number of the centre, the specification title or code and the component/unit title or code. Bulky covers or folders must not be included. If the coursework is word processed, the candidate must ensure that his/her name appears on each page as a header or footer.

Portfolios submitted for external moderation will normally be returned to centres, but the awarding body is required to retain some items for awarding, regulation and archive purposes. The centre will be informed if work is retained. Coursework submitted in digital form will constitute a copy and will not be returned to centres. In this case, centres must ensure that a copy is retained in the centre under secure conditions

Electronic evidence is currently not admissible for this qualification and therefore it is inappropriate to provide and make reference to evidence contained in electronic storage media such as 'floppy disks' and CD-ROMs.

Assessor Annotation

It is a requirement that assessors record full details of the nature of any assistance given to individual candidates that is beyond that of teaching the group as a whole. Many assessors did not record the degree of assistance provided to individual Candidates and significantly similar pieces of evidence for different Candidates was often awarded different grades without the assessor substantiating the decisions. This frequently resulted in moderators awarding substantially lower marks due to the lack of appropriate evidence.

Assessor annotation to identify where achievement has been recognised is a mandatory requirement for internally assessed work. The minimum requirement for annotation is to complete the annotation column on the Mark Record Sheet by listing the portfolio page numbers where evidence can be found for each of the assessment criteria. A significant number of centres did not provide annotation and therefore moderators were not able to identify where assessors had recognised achievement. In these cases it was necessary for the moderator to remark the work in order to provide a reliable moderator mark for the available evidence.

Witness Testimony

The preparation and provision of Witness Testimony continues to cause major problems in assessment. Candidates should assemble their portfolio and include in it all relevant Witness Testimony. Assessors should then assess the evidence produced.

Frequently assessor's decisions did not match the evidence provided by Witness Testimony. This was probably due to assessors awarding marks based on holistic decisions made during the delivery and assessment of the unit. It is important that assessors recognised that they should only make assessment decisions based on the content of the portfolio.

Whenever process skills are assessed, it is vitally important that Witness Testimony is completed by assessors in order to authenticate Candidate work and provide evidence that Candidates have achieved the level of performance required in the assessment grid. **This Witness Testimony must be detailed and state exactly what a Candidate has done and how this meets specified assessment criteria.**

It is strongly recommended that assessors use the appropriate forms provided in order to record in detail Candidate activity and the degree of independence demonstrated in the activities.

All witness testimony **must** be signed and dated by the witness.

Witness testimony should normally be supported by other forms of evidence such as annotated photographs, records of measurements etc. In some cases assessors provided statements that Candidates had met all required quality standards. In these instances the statements should be supported by records of measurements and comparison with the required standards. Similarly it is inappropriate for an assessor to record that a Candidate worked safely at all times. Witness testimony must state details of Candidate activity and equipment used accompanied by dates when observations were made. General 'all encompassing' statements are inadmissible.

It should be noted that the Mark Record Sheet does not form part of the Candidates portfolio and therefore it is not appropriate to use this form to record assistance provided and skills achieved.

Assessment of the Units

Many centres provided evidence of having benefited from the wealth of exemplar materials now available. This included the use of templates which greatly assisted the candidates in the documentation of suitable evidence. However, a significant number of centres do not appear to have availed themselves of this valuable material. This has inevitably disadvantaged some candidates.

A significant number of centres failed to differentiate between learning and teaching activities and assessment activities. Candidates who performed well generally showed clear evidence that they had been taught and provided with opportunity to practice their skills before being presented with an assignment intended to provide the evidence to meet the assessment criteria. Candidates who were subjected to continuous assessment whilst still undergoing teaching and learning activities generally performed poorly. The assessment of these units is best carried out after all teaching and learning activities have been undertaken. This enables candidates to perform to the highest possible degree of skill and independence. If teaching and learning takes place during the assessment activity it is difficult for candidates to work independently and also they will not have had the opportunity to practice their skills.

It continues to cause disappointment to find a greater number of low ability candidates selected for this programme. The programme should reflect the rigours of any other GCSE programme and should also reflect vocational practice found throughout the manufacturing industry. Where centres subjected candidate to simple handicraft exercises candidates achieved poor results.

This is a vocational qualification and centres need to provide candidates with access to up-to-date vocational resources. Where teachers do not have industrial knowledge it is important that centres generate good links with industry in order that candidates may understand industrial processes. Too often candidates demonstrate little understanding of the manufacturing industry or practices other than those applicable to the school workshop. In order to meet the higher grades candidates must be able to show some application of industrial procedures.

The assessment of these units is best carried out after all teaching and learning activities have been undertaken. This enables candidates to perform to the highest possible degree of skill and independence. If teaching and learning takes place during the assessment activity it is difficult for candidates to work independently and also they will not have had the opportunity to practice their skills.

In general terms progression across the mark bands is characterised by:

- Increasing breadth and depth of understanding
- Increasing coherence, evaluation and analysis
- Increasing independence and originality.

Therefore summative assessment should occur after all teaching and learning experiences have been undertaken in order that the candidate may demonstrate the highest achievable levels of understanding and independence and originality.

When considering work to meet the higher mark bands it may be helpful for centres to consider the following explanations which are provided in the specification:

Breadth:	Range of ideas Alternative Solutions Range of information services
Coherence:	Structured and consistent work
Evaluation:	Judging the validity of results Self criticism Identifying solutions
Independence:	Free from outside control; not subject to another's authority Without support and guidance
Originality:	Inventiveness, ingenuity, creativity, innovation, imaginativeness, uniqueness.

Candidates achieved most success when they were presented with completely unrelated assignments for each of units one and two.

Moderators generally recognised an improvement in the quality of evidence provided by many candidates. However, many centres still failed to award marks as explained in the Guidance for Teachers - Assessment Guidance - Awarding Marks.

When assessing the evidence assessors **must** refer to the evidence requirements for the unit. Marks are awarded for evidence to meet the bullet points listed in the evidence requirements (listed on pages 22 to 27 for unit 1, pages 35 to 40 for unit 2). This guidance identifies **two** aspects to each assessment criterion, and also explains the procedures for awarding marks when a particular criterion has not been fully met. Therefore in order to be awarded full marks for any individual criterion a candidate must produce evidence to meet both of the bullet points identified in the specific criterion in the **evidence requirements** for that unit.

Unit 1: Designing Products for Manufacture

Moderators were again instructed to work very closely with the evidence descriptors provided in the Guidance for Teachers section of the specification. This section provides examples of the type and level of evidence required to meet each of the mark bands for specific assessment outcomes. Many centres are still not applying the specification correctly, particularly in relation to the awarding of marks. This has caused many candidates to be disadvantaged.

Candidates are required to develop a design specification for a product, develop design and manufacturing proposals and draw up a final design and manufacturing solution.

Candidates **must be provided** with a written client design brief and they should include this brief in their portfolio.

It is not appropriate to allow candidates to choose their own design topic. However it is acceptable to provide candidates with a number of different briefs from which they are required to select **one** most appropriate brief, since this approach helps to ensure candidates undertake individual, rather than group, design activities.

The selection of an appropriate focus for the assessment of this unit continued to be vital and influenced the achievement of candidates. Although it is recognised that candidates at this stage in their development will have limited experience, it is also difficult to imagine that they could produce a worthwhile manufacturing design solution for a CD rack or a nesting box. These types of activities should be consigned to the assessment of other, less critical programmes.

The design activity must be based on a **manufacturing solution**. This is not a general product design but should be based on a manufacturing solution, how best to manufacture a number of products in order to meet the clients needs. Therefore the design options should include various manufacturing methods. It is important that candidates consider production details and constraints and Quality Standards. Many centres provided candidates with design briefs that provided only opportunity to consider aesthetic qualities and therefore the candidates were significantly disadvantaged.

Centres are strongly recommended to follow closely the Evidence Requirements listed on pages 22 to 27 of the specification. The 'What you need to Learn' section, on pages 15 to 18 of the specification, provides more information relating to the detail and depth of coverage required.

Assessment Objective a) an analysis of the client design brief and important information about key features

Candidates were generally able to list some of the client's needs and the key features of the product. However, the degree of analysis, required to meet higher mark bands, was not achieved by many candidates.

In many cases well written lists were wrongly considered by assessors to meet the requirements of the higher mark bands. In order to meet mark band two, candidates must provide descriptions of the main client needs and the main key features of the product which more clearly define the identified aspects of the brief. Similarly, in order to meet the requirements of mark band level three, candidates must provide evidence of analysis of the relevant main features. Candidates need to show how these features might affect the design and manufacture of the product.

The specification recognises the client needs as including: cost, quantity required, intended market, timescales and function.

In order to meet these needs the product must display key features which include: styling, aesthetics, size, quality standards and performance.

Assessment Objective b) details of the product design and material constraints

Centres continue to be unable to differentiate between a product specification and a design specification. Many candidates concentrated on a product's styling and aesthetic appearance without considering materials availability, properties, characteristics and performance, materials cost, health and safety/hygiene requirements, handling and storage. The 'What you need to learn' section of the unit provides details of the content of a product design specification, and it is recommended that candidates have access to this information. When teaching Product Design Specifications, teachers should provide good examples of this type of document which may be obtained from manufacturers of related products.

Assessment Objective c) details of the production requirements and quality standards

Lack of knowledge of different possible manufacturing processes made it difficult for candidates to achieve the higher ranges of this criterion. Candidates need to have been taught which processes would be appropriate for different scales of production, and the accompanying constraints of these production processes. This knowledge would then allow them to decide which would be the most cost effective and efficient way to manufacture the product in order to meet the clients' needs and the key features of the product. Hence, there was generally a poor response to the requirement of a design specification that included details of production requirements.

A significant number of candidates failed to identify other than basic quality standards, and very few candidates demonstrated any knowledge of sector specific standards, being limited to classroom/school workshop/kitchen experience and knowledge. Some of this information may be obtained from internet and library searches. However, a much more useful source of information is the relevant industry.

Candidates should provide sufficient detail to enable them to decide the most cost effective way to manufacture the required scale of manufacture of the product to the required quality standards.

Assessment Objective d) a range of design ideas and evidence of testing them

The majority of candidates produced various basic design ideas that considered different features of the product, but lacked sufficient detail. Few candidates considered the possibility of using different manufacturing techniques and how these techniques may affect the design of the product.

Many candidates and centres continue to think that a product such as a CD rack or a bird table/nesting box would be manufactured in a small workshop by individual craftsmen. This may be acceptable for a specific and limited market. However, in order to meet production schedules other less labour intensive methods would normally be used, even in underdeveloped parts of the world where labour costs are currently very low. Very few candidates appeared to have even rudimentary understanding of labour costs.

Candidates should develop design ideas that contain information about:

- Production - the most suitable process, tools, equipment and machinery
- Materials - their size, properties, characteristics and suitability for manufacturing processes
- Cost - of materials, resources and production processes, labour and estimated cost of each item
- Market - size and type
- Quality standards - for finish, tolerances, performance and quality of material.

It would be helpful if assessment tasks clearly addressed the above points. In many instances candidates did not produce evidence of a consideration of the above point, largely due to the fact that they had not been asked for this information.

Candidates need to devise suitable methods to test and compare their different design solutions against the design specification in order to identify the solution that best meets the client requirements. The use of simple tables with the awarding of arbitrary scores was sufficient to meet mark band level 1. However, in order to meet the requirements of mark band level 3 there is a need for objective testing and an explanation and justification of how the final design and manufacturing solution was chosen, and how it meets the design criteria.

Frequently moderators exercised benefit of the doubt when considering simple evidence such as a statement that this was the cheapest method of production. However, in this type of situation the moderator could only consider the lowest level of achievement. In order to meet the higher levels a candidate would be expected to provide auditable evidence of costing for each design idea in order to demonstrate which manufacturing solution best met the clients' needs.

Assessment Objective e) evidence of how you tested and justified your final design solution

A candidate's final chosen design and manufacturing solution should be tested against the design criteria and the student is required to formally justify this solution, evaluating its strengths and weaknesses compared with alternative design solutions which had been rejected.

Centre should recognise that this testing is not necessarily physical testing in all cases. As explained before, if cost is an important feature it would be necessary to provide evidence that demonstrates that the final cost of manufacture would meet the clients' requirements.

Candidates who were directed to try to 'sell' their design solution to a client usually were most successful with this criterion. They need to consider reasoned argument to convince the client that their final manufacturing solution would best meet the clients' needs, and also to be able to explain why other manufacturing solutions were not applicable.

Assessment Objective f) evidence of how you selected and used presentation techniques

Candidates are required to present the final solution to an audience, preferably a client or someone playing the client role. Many candidates produced satisfactory evidence of having made a presentation and this was often accompanied by witness testimony that proved very useful. However, many candidates were still unable to state or explain why they used specific techniques.

Candidates should never be directed to use specific presentation techniques, and when they select a particular technique they should be encouraged to consider why this technique was suitable and if another technique could be more effective. Centres should note that PowerPoint is not always the most appropriate method of presenting information. It uses many different techniques from the list of techniques on page 18 of the specification.

Assessment Objective g) evidence of how you responded to external feedback and modified your design solution

This assessment objective was best met by candidates who presented their final design solutions to clients with a detailed knowledge of the relevant vocational area and who were able to provide factual and relevant feedback.

The evidence produced was generally records of modifications accompanied by witness testimony detailing the response to questioning.

Centres should recognise that this criterion could be met by feedback from role play clients during the design process.

In order to fully meet this criterion Candidates need to:

- Provide an evaluation of all significant feedback provided, with either modifications or justification for not modifying the design
- A full explanation of the modifications and how these would affect the design solution and the end product.

Unit 2: Manufactured Products

This unit is about candidates work as part of a team to produce a number of products. They must be provided with a product specification and a production plan.

Moderators continued to report that some candidates had been unfairly led by teachers even though assessors often awarded marks for independence that was not supported by any other form of evidence.

The major problem was still that many centres did not provide sufficient information for the candidates and therefore some candidates were disadvantaged. Candidates should be provided sufficient written information to make one product to the required standard. However, there was pleasing evidence that some centres were beginning to recognise that quality indicators should be measurable. An example of this type of good practice was the provision of colour charts in order to enable candidates to identify an appropriate colour for a cooked product, instead of 'a nice golden brown'. This type of provision made it possible for candidates to provide clear and auditable evidence that they had met the required quality standards.

The candidate must receive a written Product Specification and a Production Plan and details of the Quantity required for the manufacture of a quantity of one product.

Some centres continued to treat this unit as a 'handicrafts' exercise and produced artefacts which clearly did not demonstrate an appropriate degree of skill and accuracy. In some cases it was difficult to imagine that the candidates would derive any pleasure or pride from the making of the chosen objects. Where ever possible the activity should mimic vocational practices and products manufactured should represent saleable quality. An increasing number of centres were able to meet the above requirements.

However, it is disappointing to report that there are still a significant number of centres producing unsatisfactory articles without reference to manufacturing practices.

Candidates should be provided with relevant Health and Safety information and manuals and standards.

A large part of the assessment of this unit relates to the assessment of practical activities. It is important that candidates produce evidence of what they actually did, not what they intend to do. This is particularly important when considering safe and efficient working.

Some centres used Witness Testimony as a valuable addition to much of the evidence produced by the candidate. Annotated photographs are very useful in producing evidence of candidate's practical activities. However, it is disappointing to note that many centres continue to disadvantage candidates by the production of brief statements of a general nature.

Moderators continue to report that substantially similar witness testimony is provided to candidates who have been awarded significantly different marks. Centre **must** recognise that assessors are required to assess the portfolios, and that marks awarded should relate to evidence contained within the portfolio. Success can only be achieved by candidates who produce specific and auditable evidence to meet the assessment criteria. Unfortunately some assessors resorted to making statements that some candidates had worked well during the practical sessions, but failed to produce the required evidence. Moderators can only recognise achievement by the analysis of evidence.

Although candidates are required to make a number of products in a team, they must produce individual evidence of what they did and how this meets the assessment criteria. Each individual candidate must produce a portfolio which records evidence of the individual performance to meet each of the assessment criteria. All evidence must be specific and auditable.

The evidence to meet this unit **must be generated** by the undertaking of a **specific** assessment task. The portfolio **must not** be a compilation of evidence relating to a range of different manufacturing activities, undertaken throughout the course of study.

Centres are recommended to follow closely the Evidence Requirements listed on pages 34 to 41 of the specification. The 'What you need to Learn' section, on pages 29 to 31 of the specification, provides the detail and depth of coverage. Therefore, for example, where the assessment grid evidence of safe manufacture, it is expected that a candidate should produce evidence of:

- Carrying out a risk assessment
- Care for themselves and others in a manufacturing environment
- Has followed safety procedures and instructions
- Kept a safe place of work
- Checked safety equipment, health, safety and hygiene procedures and systems are operational
- Used safety equipment, health and safety and hygiene procedures and systems correctly during combining, assembly and finishing procedures.
(See page 31 of the specification)

Assessment Objective a) worked as part of a team

This criterion requires a candidate to produce evidence of their role within the team and also success in meeting individual and team targets (see page 36 of the specification).

Some candidates provided evidence of their role within the team and also their success in meeting individual and/or team targets. However, in many cases there was little evidence to meet either aspect of this assessment objective and assessors often appeared to have made holistic judgements based on something other than auditable evidence. The evidence requirements state that much of the evidence to meet this objective is likely to be recorded via witness testimony rather than provided in writing by the student. This is because it is possible for the student to have an incorrect notion of his/her effectiveness within the team.

Teams must set and record individual targets. These may then be transferred onto a schedule and those teams which provided an effective schedule for manufacture which identified key targets were best able to provide appropriate evidence of meeting targets. It would be helpful to candidates for them to tabulate targets and to monitor achievement when undertaking the manufacturing activity. This type of evidence would also help to develop evidence of monitoring schedules and possibly generate evidence of the modification of schedules and production plans.

Assessment Objective b) used a production plan and developed a schedule for manufacture

The given production plan must include detailed information about the type and quantity of product to be manufactured. It would be helpful if the candidates were to include this production plan in their portfolios and that there was a clear indication of what had been provided by the assessor. Candidates can then use this to develop a schedule for manufacture of the products. Where candidates failed to produce effective schedules it was most frequently because they had not been given sufficient clear information. An effective schedule should include:

- Information about the preparation, processing and assembly stages of manufacture
- The sequence and timing of stages
- Critical production and quality control points
- Production and quality control procedures
- The allocation of roles and responsibilities

Individual achievement and effort should be recorded whilst the schedule is being developed. In many cases it was not possible to identify who had contributed to the production of the schedule. This was most effectively met by candidates who produced their own schedules and then used these to produce a team schedule, producing evidence of individual effort and also the best possible schedule for the manufacturing activities.

The development of an effective schedule for manufacture is vital for success in the following assessment objectives. Therefore if a team cannot produce an effective schedule the assessor should consider providing recorded assistance. This would effectively reduce the individual's ability to meet the higher mark bands for this objective only, but may significantly improve the opportunity for success in the following objectives.

Assessment Objective c) used quality control techniques

As previously reported it was pleasing to note that some centres were now providing candidates with clearly measurable quality indicators. However, some centres continue to make statements such as 'it must be a quality product'. It is important that the specification clearly states the parameters which must be met in order that the product should reflect the required quality. All quality standards should be measurable in some way. Even simple quality requirements such as smoothness should have some quality indicator. Candidates were best able to meet the requirements of this objective when clear measurable quality standards were provided in the production plan. Many assignments failed to recognise the need for appropriate tolerances and therefore candidates were unsure of whether they had met the required quality standards.

Many candidates did not understand the importance of quality indicators, and their individual role in the achievement of the required quality standards for the products. Centres are advised to teach the benefits of Total Quality (TQ) and how the overall quality of a product depends on each individual's adherence to quality requirements.

Where assignments identified appropriate tolerance levels it was easier for candidates to tabulate the results of quality control techniques and also to identify problems. This made it possible for the more able candidates to explain appropriate measures necessary to rectify problems and prevent them from happening again.

Some products were clearly of unmarketable standard, although the assessor, over generously, awarded marks for using quality control techniques. The most important aspect of this criterion is that the candidate should understand the need for quality control and should record the outcome of all such checks (see page 30 of the specification).

Assessment Objective d) prepared and used materials and components safely

Once again it was often difficult to identify evidence of candidates having prepared and used materials and components safely. However, many assessors awarded high marks for this objective, even though candidates presented little evidence to support the decisions.

The assessment objective requires student to use knowledge of the working properties of materials and components in order to achieve optimum use.

Materials processing activities might include: trimming, cleaning or degreasing, preparing blanks, annealing or freezing. Candidates must provide evidence that they have undertaken such activities. This evidence was most effectively provided by a combination of annotated photographs and witness testimony that detailed the degree of assistance provided and also the degree of competence exhibited.

In some cases candidates were awarded marks against this criterion when it was not possible to discern that materials had been prepared by the candidate. In fact in some cases candidates reported that the teacher had provided all materials.

Assessment Objective e) prepared and used tools, equipment and machinery safely

Very few candidates produced evidence of the preparation of tools, equipment and machinery. It is apparent that in many cases these activities were undertaken by centre staff. This is acceptable, but candidates should not then be awarded marks for undertaking these activities. In some cases candidates produced notes explaining how they could prepare equipment etc. It is important to recognise that marks can only be awarded when the candidate has evidence of actually carrying out activities such as cleaning, setting up and safety and hygiene checks.

Candidates generally provided appropriate evidence of the use of tools, equipment and machinery in the form of annotated photographs supported by detailed witness testimony.

Many Candidates provided risk assessments but failed to provide evidence that they had followed safety procedures and instructions.

As with other criteria, some assessors awarded different marks to candidates whilst providing significantly similar witness statements to each. Witness testimony must state what a student did and how this met a specific assessment criterion in order to justify marks awarded. Summative assessment should then award marks in relation to the evidence provided in the portfolio.

Assessment Objective f) manufactured your products safely to meet production requirements and conform to standards

This assessment objective was most successfully met by a combination of annotated photographs and witness testimony. This witness testimony stated:

- What the student did
- The degree of skill and accuracy demonstrated
- How they worked safely
- What safety equipment was used
- The degree of independence and confidence demonstrated

Where clear quality standards were stated in the given information, candidates were able to tabulate measurements and the result of tests and therefore easily demonstrate whether they met some or the main quality standards, or consistently conformed to the main quality standards as required to meet the different mark band levels.

Assessment Objective g) modified the production plan and schedule for manufacture

Candidates often recognised that quality requirements were not met consistently but were not able to make the step of converting this knowledge into suitable modification of either the production plan or the schedule for manufacture.

Where candidates were provided with a suitable table for the recoding of quality data and causes of variance they were often able to record appropriate modifications to achieve the required quality or in some cases to improve the quality of future products.

5318/01: Printing and Publishing Paper and Board

General Comments

Overall, the two sections within this paper produced a good range of responses. Lower ability candidates often gave generic responses to questions, such as 'quick/fast/cheap' which gained limited marks. Some candidates based their responses on an incorrect context and therefore did not gain marks. The more demanding questions at the ends of Section A and B were difficult for many candidates and consequently many gave inappropriate responses.

It was extremely pleasing, however, to see that the majority of candidates attempted all questions and empty spaces were kept to a minimum throughout the paper.

Most candidates would benefit from being taught examination skills and techniques as often they did not read the questions properly and questions were not answered using the 'state, describe, explain' method.

Specific Comments

Written Test

- Q1** The majority of candidates correctly identified the products belonging to the Printing and Publishing sector in part (a) and Paper and Board sector in part (b).
- Q2** The majority of candidates correctly named, and described, the use of the two pieces of equipment shown, namely a ruler and a compass.
- Q3** A straightforward and generally well answered question. However, a significant element confused ICT terms with control terms and vice versa.
- Q4** Surprisingly, many candidates did not state a product, did not state a product from the correct sector or stated materials and/or processes rather than a product. Further, a significant number of candidates insisted on using the excluded product, blister packaging, as the subject for the question. Good responses included products used in the pre-release materials for past papers or specimen assessment materials. In part (b) many candidates confused Control Technology with ICT; 'design' and 'CAD' were popular answers. Part (c) was generally well answered.
- Q5** A well answered question, although a significant element of candidates confused CAD with CAM and vice versa. This may be because they failed to read the question carefully. In part (c) many candidate responses did not consider benefits to the retailer, instead repeating answers from 5 (a) (ii).
- Q6** Most candidates were able to name an example of at least one communications technology, the method it has replaced and explain a benefit. A significant element incorrectly answered 'CAD' and 'CAM'.

- Q7** Centres are reminded that the paper is ramped in difficulty and latter questions in each section are aimed at the more able candidates. The question required an ability to provide specific responses, by drawing upon specialist knowledge. Candidates who provided answers that related to the benefits of data handling systems during the production or marketing stages of manufacturing scored well. Many candidates provided highly generic responses.

SECTION B

Based upon the mass produced blister packaging pre-release material

- Q8** A well answered question for both parts. Candidates were able to effectively explain, using notes and sketches, the function of both the Backing Board and the Blister. The vast majority of candidates had clearly undertaken research based upon the pre-release material; those that provided incorrect responses described the manufacturing process rather than the function.
- Q9** A number of candidates were unable to correctly identify the missing stages in the list. Many tried to give 'Quality Control' as a stage. The correct sequence of stages is clearly outlined in the specification and centres should refer to it. Typically, such candidates were unable to correctly identify the stage where the Blister is attached to the Backing Board. A very significant percentage of candidates could not describe Production planning in Part (c) (i), providing only generic responses such as 'planning for making'. Further, in Part (c) (ii), a significant percentage of candidates gave answers that related to the product in the pre-release material, rather than the manufacturing stage, as the product was itself a piece of packaging.
- Q10** Part (a) was well answered. However, many candidates gave generic responses such as 'plastic' when a specific material was required. Part (b) was also well answered; those that had studied the pre-release material were able to offer detailed responses in relation to why the properties of thermoplastics make them suitable for packaging. Part (c) was generally well answered - poor responses typically described a material without relating it to the question.
- Q11** A very significant number of candidates were unable to correctly state specific quality control procedures in part (a), instead providing generic responses such as 'by checking'. It is surprising that candidates are not thoroughly revising the use of crop marks, registration marks etc., as they are well documented and effective methods of quality control used widely in this manufacturing sector. Parts (b) and (c) were answered better although many candidates repeated responses from part (b) in part (c).
- Q12** Part (a) (i) and (iii) were generally answered well. Part (a) (ii) elicited a mixed response, with a significant element repeating their answer for (a) (i). However, more able candidates correctly identified that most changes are generally regarded as positive, with 'health and safety improvements' the most popular response. For parts (b) and (c) many candidates gained one mark but not the second mark as a result of not expanding their answer by describing the disadvantage/advantage.

Q13 The majority of candidates sitting the paper this year attempted this final question. This is pleasing as it is good exam technique for candidates to attempt all questions, even if the response is an informed or 'educated' guess. In part (a) the majority of responses described how CAD can be used by the manufacturer but did not state how such use can increase market share. Part (b) was answered better than part (a) with many candidates able to provide simple responses associated with labour costs. However, a significant number of candidates were unable to provide further responses and very few identified how CAM can control costs through a variety of production efficiencies. In both parts few candidates were able to provide responses that generated full marks. Again, centres are reminded that the paper is ramped in difficulty and latter questions in each section are aimed at more able candidates.

5318/02: Food & Drink, Biological & Chemical

General Comments

The paper generally worked well. It was accessible to all levels of candidates and differentiated between them.

There was evidence that candidates confused CAD and CAM. There was also evidence of candidates not fully understanding what modern technology is and how and where it can be applied in manufacturing with enough detail.

Sound knowledge and understanding of the product and its manufacture studied (digestive biscuit) was not always evident.

Modern materials were not always correctly identified and their functions not fully understood.

There were many examples of low level responses to questions including 'faster, quicker, easier, cheaper' given but with little or no explanation to support the claim. Production stages were not always fully understood, lacking sufficient detail.

There was evidence of candidates not reading questions and interpreting the questions correctly, also that the whole question had not been fully read before starting to answer, leading to repetition or confused responses.

Generic responses were often given to questions requiring some degree of application to a specific context.

Specific Comments

Written Test

- Q1** An appropriate first question, with most candidates gaining full marks from part (a). A few candidates were not able to correctly identify the products in part (b).
- Q2** A sound early question the majority of candidates gave correct answers to (b) (i). Some candidates found difficulty identifying the freezer in the second part. The explanations given relating to the uses were usually comprehensive, gaining full marks.
- Q3** A straight forward question, well answered by the majority of candidates who gained full marks.
- Q4** Part (a) was well answered by the majority, although some obvious responses such as eat were often omitted. Part (b) was generally answered well, but often lacked depth and in (ii) 'quicker, easier' common responses. Candidates often answered with a currently used material rather than a modern material in part (c). The improvements to characteristics often lacked detail, suggesting that the candidate did not fully understand the material chosen.

- Q5 When answering (a) (i) and (b) (i), some candidates confused CAM and CAD. Some responses referred to classroom experiences rather than manufacturing practices especially when referring to CAM. When answering the CAD section some responses referred to the making of packaging rather than the design. There were some high level answers relating to benefits, but quicker, easier, faster were commonly used.
- Q6 This was well answered by the majority, often gaining full marks. Some candidates confused the "new" with "old" and answered accordingly.
- Q7 Often poorly answered, there was little evidence to show that information and data handling systems were fully understood and how and where they could be applied and utilised to benefit companies. Generic and lower level answers were often given.

SECTION B

Based upon the mass produced digestive biscuits pre-release material

- Q8 Section (b) answers were generally better than section (a). This suggested that candidates had not studied the functions of the raw materials used in manufacture to sufficient depth. However candidates generally gained good marks in both (a) and (b). Marks were sometimes lost on section (b) because sketches were not always used, despite being asked for.
- Q9 Many candidates made the correct selections relating to stages of manufacture in section (a), gaining full marks. In section (b) (i) descriptions were often poor and lacked detail. Descriptions in section (b) (ii) were generally more detailed, although transport was frequently included but was not required.
- Q10 Some candidates did not understand what ingredients did or what their functions were. Basic responses were often used such as to rise, make bigger, but lacked explanations to maximise marks. Some answers given were very different from those expected and many were only able to name basic raising agents.
Modern materials and their uses were not fully understood by many candidates, some confused machines with materials. The answers given were often of a lower level than those expected from a researched manufactured product.
- Q11 This question was poorly answered by many candidates. There was frequently little use of industrial terms or references to the specific monitoring control technology used. Generally, parts (b) and (c) were answered best, but there was some repetition answers from candidates.

- Q12** Part (a) (i) was attempted by the majority and well answered by good candidates gaining full marks. Part (a) (ii) was also attempted by many and was well answered by good candidates, but there was some repetition e.g. smaller workforce. Part (a) (iii) was again attempted by many with good candidates gaining maximum marks, however, the term "global environment" had many interpretations and answers were broad and varied as a result. Parts (b) and (c) answers were appropriate to the question but again some repetition was evident, however, defining the environmental advantages proved difficult for some candidates.
- Q13** Attempted by many, and generally answered well by good candidates. Some lower level candidates confused CAD with CAM and were not clear on market share and cost control, giving only basic and sometimes generic or irrelevant answers.

5318/03: Textiles and Clothing

General Comments

In general some candidates were able to access questions throughout the paper and many evidenced a good understanding of the specification content. However, the more demanding questions at the end of Section B were difficult for most candidates and many gave inappropriate responses.

Some candidates gave responses based on the previous year's mark scheme and did not gain marks because the context of this year's questions were different from the previous year. Lower ability candidates often gave generic responses to questions, such as 'quick, fast, accurate, cheap' which gained them limited marks. Many lost marks through not reading the questions properly, e.g. answering 'CAM' related questions with responses related to 'design'. Most candidates would benefit from being taught exam skills.

Modern materials were known and referred to, but their functions and justifications for use were not always fully explained.

Some candidates' research of the Pre- release product, had improved from last year, but was limited in areas of detail in particular 'coatings' on fabric. Entries were higher than previous years.

Specific Comments

Written Test

- Q1** Questions 1 (a) and (b) were well answered and many candidates achieved full marks.
- Q2** This was generally well answered although many did not know 'pinking shears' only commonly referred to as 'scissors'. Some described an 'over locker' as a sewing machine.
- Q3** Again this was well answered and many candidates achieved full marks. Some lost marks through leaving a term unlinked.
- Q4** Part (a) (i) was generally well answered although some did not name a product but a material. In (b) (i) most candidates answered well, however, the 'benefits' were less well answered, especially by lower ability candidates. Candidates often could not name a specific stage in (c) (i) and the advantage of control technology was often answered as a generic response rather than specific to the stage.
- Q5** This question was often not well answered, particularly by lower ability candidates. Many confused CAD and CAM, in some cases giving a response to the CAM question with an answer that was too much CAD related. Low responses were triggered with answers such as 'accurate, quicker and less waste'.

- Q6** Part (a) (i) was often not well answered, particularly by low ability candidates. However, some candidates could describe at least one communication technology and could explain its benefit. Many said email for (a) but others said phone or fax. Only a few said video conferencing. They could answer replacements but could not always be able to respond to the 'benefit' in an appropriate way, often only triggering one mark. However, candidates improved on their understanding of the question from 2006, in response to the 'manufacturer'.
- Q7** Again this question was generally not well answered. Answers to 'production efficiency' were triggered by simple answers of 'faster' or 'less waste' for minimum marks. 'Marketing' received simple responses relating to 'surveys' or 'seeing what the customer wants'.

SECTION B

Based upon the mass produced weather protective jackets pre-release material

- Q8** Parts (a) and (b) were generally well answered and many candidates achieved full marks. There were some very good sketches but also some very weak or non-existent ones. In (a) most addressed the tightening or loosening of the cuff and the prevention of rain getting into the sleeve so could access all the marks with a relevant sketch. A fair number, however, described the 'workings' of Velcro itself and therefore failed to trigger any marks. In (b) many did not address the added protection of the storm flap to the zip, so could not access all marks.
- Q9** Part (a) (i) was generally well answered, although weaker candidates could not name the stage in (a) (ii). Part (b) (i) was generally well answered, with most students triggering marks through 'check what has to be made' or 'see if you have all materials'. Very few accessed marks through health and safety or control points. Part (b) (ii) was answered very well, with most answers being triggered through the same areas of adding bag, put in a box and send to the client.
- Q10** Part (a) (i) was generally well answered, especially by candidates who undertook the research outlined in the Pre-release. These candidates could give a specific material for the weather protective jacket. Part (a) (ii) was answered less favourably, with very few accessing marks through 'mesh'. Centres may need to focus more on the research for the Pre-release material. Part (b) (i) was answered very well; candidates recognised the functions clearly through protection to fabric and wearer. Part (b) (i) was often well answered. Part (c) candidates often responded with the answers referring to the consumer rather than the manufacturer and therefore failed to trigger many marks.
- Q11** This question was often not attempted. Low level responses and repetition often occurred e.g. (a) (i-ii) 'check they are all there' etc. In Part (b) (i-ii) and (c) (i-ii) most candidates could not specifically identify a benefit of quality control other than reduces waste or 'get a better product'.

- Q12** This question was difficult for many candidates, but well answered by those who understood the question. Responses to part (a) were well answered and many candidates achieved full marks or triggered one mark on each of (i), (ii), (iii). Part (b) and (c) mainly elicited responses related to the previous question without advancing into further detail, usually homing in on responses such as 'lose jobs' or 'causes pollution'.
- Q13** As in previous years this was the least well answered question in the paper. Very few candidates understood the question and gave low appropriate responses related to the use of CAD and CAM e.g. in (a) an understanding of changing ideas quickly and in (b) of less waste. This question was often misread or misinterpreted by candidates, particularly in (b) where candidates did not relate their responses to cost.

5318/04: Engineering Fabrication

General Comments

Overall this paper produced a wide range of responses across the whole paper and for the two sections within it. It was extremely pleasing to evidence that the majority of candidates attempted all questions, and empty spaces were kept to a minimum throughout the paper.

Specific Comments

Written Test

- Q1** The majority of candidates correctly identified the products belonging to the fabrication sector in part (a). However, some candidates failed to pick up on the products in part (b) predominantly manufactured from metal i.e. the BMX bike and Power-kite buggy. There were many responses against the distractors from an extreme sports theme.
- Q2** Many candidates were able to gain marks for naming and identifying the use for a washer.
Many candidates gave an answer of screw or bolt which failed to gain any marks but were able to gain marks for explaining their uses.
Some candidates used the stem of the example as the use.
- Q3** A straightforward and well answered question.
- Q4** The majority of candidates were able to name and explain an appropriate product. Many examples were taken from past papers or specimen assessment materials. Part (b) gave candidates the most problems where they were unable to state the stages where 'control technology' is used. However, candidates were rewarded for identifying the process that used control technology. Part (c), some candidates stated a modern material that was not particularly suited to the product named.
- Q5** Part (a) most candidates were able to name an example of where CAM is used and explain a benefit. Part (b), again, most candidates were able to name an example of how CAD is used and explain a benefit.
In part (c) many candidates were unable to explain a benefit to the distributor. This may be because they failed to read the question carefully and answered with another benefit to the manufacturer.
- Q6** The format of the question changed this year and allowed a significant number of candidates to produce good responses to parts (a), (b) and (c). Candidates were able to focus on one communication technology at a time and identify a method it replaced and a benefit.

- Q7** This question posed the least appropriate responses for Section A. This could be down to a lack of understanding of information and data handling systems in relation to production efficiency and marketing indicating that the paper was ramped correctly.
The most common answers for (a) was discussing monitoring of material levels.
The most common incorrect answer for (b) was using the internet to advertise the product.

SECTION B

Based upon the mass produced metal cantilever toolbox pre-release material

- Q8** Generally well answered for both parts of the question. Some candidates were unable to gain the full three marks for each part as they failed to use both notes and sketches. Some candidates simply copied the sketches and notes from (a) when completing question 8 (b).
Centres are reminded that this question is awarded up to two marks for either notes or sketches - both are therefore required for maximum marks.
- Q9** A significant number of candidates were unable to correctly identify the missing stages in the list. These stages are clearly outlined in the specification. Considerably more candidates were able to correctly identify the stage where the hinges are riveted to the main body of the tool box.
- Q10** Part (a) was generally very well answered with candidates correctly stating specific materials for the main body and the rivets on the parallel motion linkage.
Part (b) (i) was extremely divided; those that had studied the metal cantilever tool box in detail were able to identify a specific material used for powder coating metal. Part (b) (ii) was generally answered quite well.
Candidates were able to explain two reasons for powder coating with popular responses referring to corrosion resistance and aesthetics.
In part (c) many candidates were able to apply their knowledge and understanding of modern materials to the metal cantilever tool box effectively. However, it is clearly apparent that many candidates do not have a sufficient working knowledge of modern materials.
- Q11** The majority of candidates were unable to correctly identify, describe or explain the benefits of 'quality control' in part (a). Many popular incorrect responses included the use of CAM as quality control. Some candidates gained marks by describing how quality control was achieved. A typical response was checking the tool box was the correct size or testing the handles and hinges were working. Many candidates produce the same response for the benefits to the manufacturer and consumer.

- Q12** Many candidates were able to gain marks for part (a) (i) by explaining changes in the size of the workforce, but there was limited reference to the change in type of workforce. Part (a) (ii), some candidates used a similar response to Part (a) (i) with a typical response of a reduction in the workforce. Part (a) (iii) was well answered with many candidates aware of the environmental damage and the operational efficiencies created by the utilisation of modern technology. Part (b) and (c) again was well answered but some candidates simply repeated their response from part (a).
- Q13** The majority of candidates sitting the paper this year attempted this question. This is pleasing, as it is always good exam practice for candidates to attempt all questions even with an informed or 'educated' guess. Part (a) was better answered than part (b), with many candidates able to describe how CAD is used by the manufacturer to increase market share. However, a significant number of candidates did not have sufficient knowledge to understand the term 'market share'. Many candidates described how CAM is used to control manufacturing costs in part (b) was correctly identified but often candidates were unable to offer any description of sufficient depth.

5318/05: Electrical and Electronic, Process Control, Computers, Telecommunications

General Comments

Overall, this paper enabled a good range of responses across the whole paper. Research into digital multimeter was evident in responses to Section B. Compared to previous years it was pleasing to see the majority of questions attempted by candidates. However, as with past papers the ramped nature of the paper meant that candidates found it hard to maximise marks in the latter part of the paper. It was disappointing that entries to this examination were down from previous years.

Specific Comments

Written Test

- Q1** A very straight forward question, the majority of candidates were able to identify the correct sector for both part (a) and (b). Most candidates achieved full marks.
- Q2** Good responses to the identification part of the question but the uses challenged some candidates.
- Q3** Very good responses, question posed few problems to candidates.
- Q4** Parts (a) and (b) were generally well answered. However, there was evidence that candidates were unsure about the use of 'control technology'. Generic terms such as 'plastic' were given as modern materials but overall good responses were received for characteristic improvements.
- Q5** Candidates generally knew the difference between CAD and CAM and were able to pick up a good range of marks. However, some low level responses were evident such as 'faster, easier, and cheaper'.
- Q6** Good responses to this question, candidates generally had little problem distinguishing between a new communications technology and one it has replaced.
- Q7** Generally not well answered. Low level responses were again in evidence. However, when answered well, good answers were given and full marks awarded.

SECTION B

Based upon the mass produced digital multimeter pre-release material

- Q8** Generally well answered by candidates. Some candidates did not include sketches and therefore disadvantaged themselves by not being able to achieve full marks.
- Q9** A straight forward answer with many perfect responses to part (a) of this question. Significant numbers of candidates gave very poor, low level responses to part (a) and therefore gained limited marks.
- Q10** In part (a) candidates were able to name specific components and was generally answered well.
Candidates were also able to correctly name two materials that made up solder.
Good responses were also received for the function of solder with candidates scoring well.
Part (c) enabled candidates to apply their knowledge of modern materials to the digital multimeter effectively.
- Q11** Part (a) attracted many correct responses but weaker candidates were unable to describe 'quality control procedures'. It was hoped that candidates would be able to identify a QC procedure and explain how it is performed, but, very few were able to give a model answer.
- Q12** Most candidates were able to attempt all parts of this question. There were considerable differences in quality of answer between lower and higher grade candidates as expected. Good responses given for part (a) with a large number of candidates achieving full marks.
In part (b) and (c) candidates were not able to give good responses to the disadvantages and advantages in this question. Low level responses were mainly given.
However, this is to be expected by the nature of the paper's ramping.
- Q13** Candidates found this to be the most challenging question on the paper. However, some good responses were received, especially from the more able candidates, and, as such, provided good differentiation.

5318/06: Mechanical, Automotive

General Comments

Overall this paper produced a good range of response across the whole paper and the two sections within it. There was evidence that candidates were not able to identify and explain the use of the socket head cap screw in question 2. The more demanding questions at the end of Section B were difficult for most candidates and many gave inappropriate responses. Some candidates gave general responses or based their responses on incorrect contexts and did not gain marks. It was extremely pleasing, however, to evidence that the majority of candidates attempted all questions and empty spaces were kept to a minimum throughout the paper. Lower ability candidates often gave generic responses to questions, such as 'quick, fast, and cheap' which gained those limited marks. Most candidates would benefit from being taught exam skills as often, they did not read the questions properly.

Specific Comments

Written Test

- Q1** A good range of responses, well answered by many but distracters caught poorer candidates out in a few cases. The vast majority of candidates selected appropriate products belonging to the mechanical sector for part a) whilst some dropped marks when selecting the products from the automotive sector. Road bridge and to a lesser degree Cargo pants caught some out.
- Q2** Often candidates did not recognise the socket head cap screw. A significant number of candidates were unable to state the correct term. Some candidates were over influenced by the example given.
- Q3** Generally this question was answered very well. Whilst the materials links were generally good, there was confusion between ICT and control technology. Control technology is an embedded part of this unit and should be emphasised throughout the delivery.
- Q4** A wide range of appropriate products were evidenced some from last year's foot pump or the trolley jack or the fire extinguisher from previous years. Some answers were very similar to the pre-release product such as 'hydraulic cylinder'. Explanations were generally sufficient to be awarded a range of marks. Centres are reminded that products from this sector are wide and varied so candidates should always be able to gain some marks from these types of questions. Often candidates were unable to give a stage in part b) where control technology would be used. The most obvious answer here would be within production. Many generic responses rather than specific materials and improvements were seen in part c). Candidates should, in this question concentrate on the product stated in part (a) and not the pre-release product.

- Q5** Most candidates were able to gain some marks from this question from their general understanding of computers in manufacturing. A lot of the candidates however, seemed to find this question difficult to answer. The response to the question was varied and indecisive apart from the application of CNC or other machining departments where CAM could be applied in part (a) (i). When an answer was given, the benefits were often not outside the simple response about speed and costs. Part (b) however, was answered a little better. Part (c) was mainly answered correctly by only the higher achievers.
- Q6** Although often good responses were seen, many candidates were unable to give two varied answers between example 1 and 2. Hence, the benefits given were also limited. Some were unable to answer the question or gain marks as it appeared they did not know about communications technology.
- Q7** Some candidates failed to attempt this question. Some good responses were given by the higher achievers. Often others did not put their answers in the context of data handling. General responses to activities about marketing were not rewarded.

SECTION B

Based upon the mass produced pneumatic cylinders pre-release material

- Q8** This question was well answered, with many candidates able to gain all marks by using notes and sketches to explain the functions of the piston rod and body. Marks were awarded for what the candidates communicated and not how they communicated, although those who only gave either notes or only gave sketches were unable to gain maximum marks.
- Q9** Whilst the responses to this question were better than in previous years some candidates still struggled to recall the stages of manufacture as outlined in the unit specification. It was disappointing to see many responses for part (b) (i) that indicated a design process and not a proper engineering planning process.
Centres should ensure that candidates are made aware of industrial practices in planning as opposed to the planning, that takes place during design at key stage 3 in D&T.
- Q10** Part (a) of this question provided an opportunity for many candidates to gain two marks. The responses expected needed to be specific materials although a range of 'generic material' answers were accepted for the cylinder body. Part (b) caused problems for many. It is apparent that many centres had not covered why stainless steel would be used in engineering products in their delivery.
The most able candidates were able to gain full marks for part (c) when they responded with a full explanation.
- Q11** Many candidates struggled to clearly give a varied response throughout this question. Whilst responses did indicate the procedure albeit often in terms of what would be measured, very few were able to complete their description by giving how this was done. Those who were able to offer benefits to the manufacturer were unable to give a different answer applicable to the consumer in part (c).

- Q12** Most responses by weaker candidates for this part of the question gave very simple statements and only attracted minimum marks. The differentiation aspects of this question allowed those who knew about the impact on the global environment to be rewarded. Some were confused with part (a) (iii) when they tried to answer about the global economy which was a question in a previous paper. In both parts that were about the workforce responses, gained more marks than those parts about the global environment.
- Q13** Generally poor responses, but as a progressive question it differentiated ability levels. Many wrote a lot for part (a) but failed to target their response to the effect on the context of increasing market share when linked to the use of data handling systems and therefore failed to score any marks. A similar situation arose in part (b) where the response did not focus on the use of data handling systems
Most candidates found this question challenging and as such very few were able to access all of the marks. A pleasing aspect did exist again in this paper that some lower achievers were able to gain 'odd' marks for this question.

Statistics

Coursework

Unit 1: 5351 - Designing products for Manufacture

Grade	Max Mark	A*	A	B	C	D	E	F	G
Raw Boundary mark	42	38	33	28	23	19	15	11	7
Uniform boundary mark	100	90	80	70	60	50	40	30	20

Unit 2: 5352- Manufactured Products

Grade	Max Mark	A*	A	B	C	D	E	F	G
Raw Boundary mark	42	38	33	28	24	19	15	11	7
Uniform boundary mark	100	90	80	70	60	50	40	30	20

Statistics

Unit 3 - 5318 External examination with pre-release

5318/01 - Printing and Publishing, Paper and Board

Grade	Max Mark	A*	A	B	C	D	E	F	G
Raw Boundary mark	100	80	73	66	59	51	44	37	30
Uniform boundary mark	100	90	80	70	60	50	40	30	20

5318/02 - Food & Drink, Biological & Chemical

Grade	Max Mark	A*	A	B	C	D	E	F	G
Raw Boundary mark	100	93	84	75	67	58	50	42	34
Uniform boundary mark	100	90	80	70	60	50	40	30	20

5318/03 - Textiles and Clothing

Grade	Max Mark	A*	A	B	C	D	E	F	G
Raw Boundary mark	100	76	68	60	52	46	40	35	30
Uniform boundary mark	100	90	80	70	60	50	40	30	20

5318/04 - Engineering Fabrication

Grade	Max Mark	A*	A	B	C	D	E	F	G
Raw Boundary mark	100	84	76	68	60	53	46	39	32
Uniform boundary mark	100	90	80	70	60	50	40	30	20

**5318/05 - Electrical and Electronic, Process Control, Computer,
Telecommunications**

Grade	Max Mark	A*	A	B	C	D	E	F	G
Raw Boundary mark	100	75	68	61	54	47	41	35	39
Uniform boundary mark	100	90	80	70	60	50	40	30	20

5318/06 - Mechanical, Automotive

Grade	Max Mark	A*	A	B	C	D	E	F	G
Raw Boundary mark	100	76	68	60	52	46	40	34	28
Uniform boundary mark	100	90	80	70	60	50	40	30	20

APPENDIX 1

Support Paper for Teachers of GCSE Engineering/Manufacturing
Use of Pre-release for the External Examination Unit 5318

This will be included later

The complete final version will be uploaded on the Edexcel
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