GCSE

Manufacturing

General Certificate of Secondary Education **J505**

General Certificate of Secondary Education (Double Award) **J510**

OCR Report to Centres

June 2013

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OCR REPORT TO CENTRES

Overview

Entries for all four units were submitted this session, and candidates had generally been well prepared for the Controlled Assessment units and written examination papers.

Work presented in the Controlled Assessment units followed the requirements of the specification closely. Good practice was seen in a number of portfolios presented for moderation, and candidates made good use of computer generated work in many cases.

Candidate responses in the written examinations indicated that the specification content for these units had been generally well covered by most centres. The depth of candidates' knowledge and understanding was somewhat limited in certain areas, however, details of which are given later in this report.

Most candidates attempted all of the questions on the examination papers but, in a few cases, questions with no response indicated gaps in candidates' knowledge of the specification content. There was some evidence of candidates not having read questions carefully before answering, resulting in an unnecessary loss of marks.

B231 Controlled Assessment

Folders and Presentation of Candidates' Work

In general, the work provided by centres was well presented and carefully marked and the detailed annotation provided by many centres was much appreciated by moderators. Where folders were clearly divided into sections, it was easy to determine how the centre had awarded their marks. It is best practice to present folders in this way and centres are urged to encourage candidates to do this.

Centres are reminded of the general OCR requirements when submitting work for moderation, especially the need to clearly identify each piece with Centre Number and Candidate Number. With electronic submissions, the details should be provided in the filename of every file, and paper portfolios should have the pages securely fixed inside a cover sheet.

It is good to see more centres making use of the OCR Repository and submitting work electronically rather than on paper. Creative use of new media not only motivates candidates to produce exciting, high quality work, but also considerably reduces the cost of providing samples for moderation. When using the Repository, it is recommended that, rather than submitting multiple files for a candidate, work is grouped together and submitted as one single file for each candidate, preferably in PDF format.

Centres should note that 'slide binders' should not be used as these can become detached in the post. If plastic wallets are used, it is important that only one sheet of paper is stored in each wallet and they are arranged so that papers do not have to be removed to read them, ie papers are not folded. Further details of these requirements are found on page 36 of the OCR Manufacturing Specification (issue February 2010).

The comments provided by centres on the record of assessment form URS967/8 were helpful in explaining the reasons behind the marks awarded. Centres are reminded of the requirement to clearly attach this form to the front of the assessed work of each candidate.

General Issues and Recommendations

Centres are reminded that candidates cannot be awarded marks for work that is not covered by the current specification, and work must be clearly identified and aligned to a particular section of the specification. The current OCR specification includes notes of guidance for use of the 'Best Fit' approach to marking. This can be found on p36 and p37 of the Manufacturing Specification. Marking should be positive, rewarding achievement rather than penalising failure, and centres should adopt the approach described in the Specification on p37. Firstly, the descriptor that best describes the candidate's work should be identified. A value judgement should then be made as to whether the candidate 'convincingly', 'adequately' or 'just' met the criteria statement, and the mark adjusted up or down accordingly. In some cases, a candidate may meet the criteria at the top level for one aspect and a lower level for another aspect. In these cases, the above process should be followed for each aspect, and the average of the two scores recorded as the candidate's mark.

Centres are reminded that the focus of the work selected by candidates for controlled assessment tasks must be based on the lists provided in the OCR Manufacturing Specification. Candidates must not submit work for assessment if it fails to meet this requirement.

Certain words and phrases are used frequently within the marking criteria. It is not possible to give precise, generic guidance as to how phrases such as 'wide range' or 'justified ' should always be interpreted, as the context and type of product must always be taken into account. If the evidence is presented as a simple list with no explanation, then there has clearly been no attempt at justification and the work should not be marked using a criteria block that refers to 'justified'. However, it is important to apply a 'sense check' to the amount of justification that can reasonably be expected for a particular product and this can, of course, vary from one product to another.

Issues and Recommendations Relating to Specific Sections

Unit B231 – 1A Study of a Manufactured Product

Centres are reminded that work for Unit B231 1A requires candidates to select a product from the list and then identify two further, similar products that have subsequently been developed using modern technology. There should be a discernible link between the three products and some evidence of how technology has enabled these developments. An example of this could be improvements in plastics production enabling the materials to be used to manufacture kettles which, in turn, enables more sophisticated shapes to be employed in kettle design. Centres are reminded that only one product from the list should be chosen.

Candidates should be careful to address the correct topic for each section. For example, where a section requires an explanation of the manufacturing processes used, few if any marks can be awarded for work that refers only to the materials and components used to make the product, however comprehensive and well presented the explanation is.

Unit B231 – 1B Manufacturing a Product

Centres must provide clear evidence for the making of a prototype of their design solution in Unit 231 1B. Best practice is to provide 3 or more photographs, taken from different angles and with enough detail to clearly show how complete the prototype is and give a clear indication of its quality. If the prototype contains several different parts, for example an electronic circuit and a casing, then photographs must clearly show each part. It is encouraging to see centres now providing excellent photographic evidence.

If a centre awards marks against the criteria statement 'The candidate makes a complete, quality prototype of the design solution that allows for detailed testing', moderators must be presented with enough evidence to determine that the work meets this criterion, rather than that in one of the other blocks. It is very important that this aspect of the assessment is carried out correctly

B232 Manufacturing processes (Written Paper)

This is a one hour examination paper that requires candidates to have a sound knowledge related to the products and manufacturing environments/sectors that they have studied.

Most candidates attempted all of the questions on the paper but, in a number of cases, there was some evidence of candidates not having read questions carefully before answering. It is most important that candidates take the time to read through the question paper before attempting to answer questions, as this can help to ensure that basic errors are avoided.

Questions relating to basic materials and components were generally quite well answered, but this was not the case with 'modern materials'. Knowledge and understanding of modern technologies and their application was also found to be quite limited.

A considerable number of candidates did not attempt the questions relating to control systems and, where responses were presented, these were generally weak.

Comments on individual questions

Q1 **(a)** This question was attempted by all candidates and was well answered. Where marks were lost, this was generally due to confusion between products made in the 'Electrical' and the 'Electronic and Communications' sectors.

Q1 **(b)** Although most candidates were able to identify a computer controlled machine used in a manufacturing sector, descriptions of the machine's use were often too limited to justify full marks for the question.

Q2 **(a)** This question required candidates to identify two activities carried out in the design stage of making a new product. Most candidates were able to score well on the question, with 'research' and 'presenting design ideas' being popular responses.

Q2 **(b)** Some candidates did not attempt this question, but in most cases responses scored at least one of the two marks available. Stages such as 'assembly' and 'finishing' featured in many responses, and 'packing' was also often seen.

Q2 **(c)** In these questions, candidates were asked to identify 'modern technologies' used in **(i)&(ii)** quality control and dispatch. In general, the questions were not well answered, with a significant number of candidates giving simplistic responses such as 'use computers to check for faults' and 'use robots for packing'.

Q3 **(a)** **(i)** It was disappointing to see that a significant number of candidates did not attempt this question. Where responses were presented, however, most candidates were able to describe two processes used when making a prototype product prior to full scale production.

Q3 **(a)** **(ii)** Again a significant number of candidates did not attempt this question. Where a response was presented, marks were often lost by simply stating a safety precaution taken without giving a description of its use.

Q3 **(b)** This question was not well answered, with only a minority of candidates able to give a satisfactory explanation as to why a manufacturer would use quality control procedures. In most cases responses were too simplistic to qualify for the full three marks available.

Q4 **(a)** This question was very well answered, with the majority of candidates being able to interpret the information in the table successfully.

Q4 **(b)** Most candidates were able to explain why material D might be unsuitable for large batch production at regular intervals, relating their answers to storage and availability problems. Where marks were lost, this was normally as a result of the candidate making simplistic statements, rather than offering an explanation.

Q4 **(c)** Responses to this question were rather disappointing in many cases. Only a limited number of candidates were able to gain full marks by giving three valid properties of plastics materials that would make them suitable for making manufactured products. The most frequently seen responses related to the ease of forming plastics materials into complex shapes, and the fact that they are readily recycled.

Q5 **a)** This question was, in the main, very well answered. The majority of candidates showed good knowledge of what constituted 'bought-in' components and were able to give suitable examples.

Q5 **(b)** Although the previous question was answered well, only a limited number of candidates were able to explain the benefits to a manufacturer of using 'bought-in' standard components. In most cases, responses referred simply to cost and time savings, without providing any real explanation.

Q6 **(a)** In this question candidates were asked to describe how modern materials and technologies were used in a product that they had studied. Most candidates were able to match a product with a modern technology used, but responses relating modern materials were generally quite weak.

Q6 **(b)** This question focussed on the benefits to a manufacturer of using modern production methods. Most candidates attempted the question, but many lost marks by simply focusing on answers such as 'quicker,' faster,' cheaper,' and 'easier' to manufacture the product.

Q7 **(a)** Responses to these questions were very weak, and a significant number of candidates
(i)&(ii) did not offer any responses at all. Very few candidates succeeded in giving even simple examples of 'Input' and 'Output' devices such as switches and sensors, and buzzers and bells.

Q7 **(b)** This question was attempted by most candidates, but was not well answered. In most cases only a simple reference to a control system was made, and very few candidates gained more than a single mark for their response to the question.

Q7 **(c)** Responses to this question were slightly better than for the other 'control system' questions, with the higher achieving candidates describing the use of air monitoring systems to improve working conditions in factories. In most cases, however, responses were again too simplistic to qualify for more than a single mark.

Q8* This question asked that candidates discuss the effects that the introduction of modern technology has had on the quality of manufactured products.
Responses for this question were varied. In general, the question was not particularly well answered, with a number of candidates who attempted the question choosing to focus on the effects that it has had on the workforce and the workplace rather than on the quality of the product itself.

The candidate's Quality of Written Communication (QWC) was assessed in this question, and marks were awarded for well written answers where technical content was limited but relevant.

B233 Controlled Assessment

Folders and Presentation of Candidates' Work

In general, the work provided by centres was well presented and carefully marked, and the detailed annotation provided by many centres was much appreciated by moderators. Where folders were clearly divided into sections, it was easy to determine how the centre had awarded their marks. It is clearly best practice to present folders in this way and all centres are urged to encourage candidates to do this.

It is good to see more centres making use of the OCR Repository and submitting work electronically rather than on paper. Creative use of new media not only motivates candidates to produce exciting, high quality work, but also considerably reduces the cost of providing samples for moderation. When using the Repository, it is recommended that, rather than submitting multiple files for a candidate, work is grouped together and submitted as one single file for each candidate, preferably in PDF format.

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Certain words and phrases are used frequently within the marking criteria. It is not possible to give precise guidance as to how phrases such as 'wide range' or 'justified ' should always be interpreted, as the context and type of product must always be taken into account. If the evidence is presented as a simple list with no explanation, then there has clearly been no attempt at justification and the work should not be marked using a criteria block that refers to 'justified'. However, it is important to apply a 'sense check' to the amount of justification that can reasonably be expected for a particular product and this can, of course, vary from one product to another.

Issues and Recommendations Relating to Specific Sections

Unit B233 3B Real World Manufacturing

In Unit B233 3B 'Real World Manufacturing' candidates are required to study the manufacture of a product of their choice, have selected from the list provided by OCR. References to batch and quantity production should not be generic, but should be related back to the product being studied. Marks in the higher bands cannot be awarded for simple, generic statements about batch production.

Unit B233 3B Making a Manufactured Product

In Unit 233 3B, candidates are required to detail their individual application of health and safety procedures and quality control techniques. Centres are reminded that marks should only be awarded for evidence relating to a candidate's individual application of these procedures, and that generic accounts of quality control or health and safety issues are not sufficient.

In Unit B233 3B candidates are required to work in teams. It is especially important that the assessment criteria are carefully applied in this Unit. Centres are reminded that some parts of the assessment criteria grid require evidence of the candidate working as part of a team and other parts require evidence of the candidate's individual contribution. These different aspects must be clearly evidenced in the candidate's portfolio, and making diaries with digital photographs can be used to good effect for this purpose.

B234/02 The Impact of Modern Technology on Manufacturing (Written Paper)

This is a one hour examination paper and requires that candidates have a sound knowledge related to the products and manufacturing environments/sectors that they have studied.

Most candidates attempted all of the questions on the paper but, in some cases, there was evidence of candidates not having read questions carefully before answering. It is most important that candidates take time to read through the question paper thoroughly before attempting to answer questions. This is particularly important where questions have a very specific focus and require extended writing in the response, as is the case in the Quality of Written Communication (QWC) question.

Questions that dealt with materials and components were generally well answered, but responses to questions relating to modern technologies were quite disappointing in many cases. Candidates' knowledge and understanding of issues affecting a company's image was also quite limited.

Comments on individual questions

Q1 **(a)** This question required candidates to correctly link given manufacturing sectors with a list of associated products – it was well answered by all candidates.

Q1 **(b)** This question was generally well answered by most candidates, but in some cases marks were lost where the modern technology stated was not directly relevant to the product selected from the list.

Q1 **(c)** Most candidates were able to name a sector not in the original list and give an example of a product made in the sector. Where marks were lost, this was normally as a result of the candidate incorrectly naming a sector, but in these cases a mark was allowed if a relevant product had been given.

Q2 **(a)** This question was very well answered, with all but a very small number of candidates scoring full marks on it. The most frequently named materials that are commonly recycled were aluminium and thermoplastics, but other materials, such as copper and steel, were also mentioned in some cases.

Q2 **(b)** This question required candidates to describe two factors that should be considered when disposing of waste materials. In general, the question was well answered with most candidates showing an awareness of the necessity to recycle materials. The more able candidates also mentioned the effects that disposal of waste products might have on the environment. In a small number of cases, simplistic responses restricted candidates' ability to score more than two of the four marks available for the question.

Q3 This question required candidates to describe the impact of the introduction of new technologies on 'training,' 'product variety' and 'material selection.' Although all candidates attempted the question, in many cases the responses were quite disappointing and only the more able candidates were able to gain marks in each of the three areas.

Q4 **(a)** This question was well answered in the majority of cases, with most candidates being able to give at least two factors that would need to be considered when using 'standard components' in manufactured products. The most frequently seen factors were those relating to cost and availability, but the higher achieving candidates also identified savings of time and resources when using components from specialist suppliers.

Q4 **(b)** All candidates attempted this question and many were able to give three 'disadvantages' of buying in components from another company. The effects of a failure to supply on time was referred to in many responses, as were issues with the control of quality.

Q4 **(c)** A significant number of candidates did not attempt this question and most candidates appeared to be unfamiliar with the term 'complexity reduction'. Only a limited number of the more able candidates scored marks on the question and, in some cases, responses were too simplistic to qualify for any marks.

Q5 **(a)** **(i)** This question was poorly answered, and a number of candidates did not offer a response at all. Only a small minority of the more able candidates were able to give a satisfactory answer to the question 'What term is given to the type of 'waste' when one machine in a production line runs slower than the rest.'

Q5 **(a)** **(ii)** Despite the fact that the previous question was poorly answered, responses to this follow-up question were generally quite good. Most candidates managed to score at least 1 mark for the question, and the more able candidates gained good marks by explaining what the effects of the delay might be.

Q5 **(b)** This question required candidates to describe two factors that should be considered when selecting a new technology in order to improve a manufacturing process. The question was generally well answered, with most candidates gaining at least half marks for the question. Where marks were lost, this was normally as a result of a candidate only describing one factor, or giving overly simplistic responses.

Q6 In the main, this question was reasonably well answered, although few candidates gained high marks on it. The majority of candidates were able to give at least two factors that should be considered by a team when producing a batch of products but, in many cases, descriptions of the factors were rather weak. Where descriptions are required in a question, these should be f justified to qualify for full marks.

Q7 The question was reasonably well answered by the majority of the more able candidates, who were able to explain in sufficient detail the effects that 'noise,' 'transport' and 'employment' have on the image of a manufacturing company. In some cases however, candidates tended to give answers related to the product rather than the manufacturer.

Q8* This question asked that candidates discuss the effects that the introduction of modern technologies could have on the health and safety of the 'workforce.'

It was pleasing to note that virtually all candidates at least made an effort to answer this question. Although responses for the question were varied, in general the question was reasonably well answered, with the majority of candidates picking up at least 1 mark. Most responses made reference to the use of robots instead of humans in hazardous conditions, and the monitoring and control of air quality in factories was also mentioned.

The candidate's Quality of Written Communication (QWC) was assessed in this question, and marks were awarded for well written answers where technical content was limited but relevant.