GCSE

Manufacturing

General Certificate of Secondary Education **J505**

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

OCR Report to Centres

June 2012

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OCR REPORT TO CENTRES

Overview

Entries were made for both of the Controlled Assessment units this session, with a number of good examples of portfolios being seen by moderators. In all cases, candidates had based their projects specifically on the themes presented in the OCR GCSE Manufacturing Specification.

Responses to questions in the written papers (Units B232 and B234) indicated that candidates had generally been well prepared for the examinations, and it was encouraging to see the level of responses in many cases. The depth of knowledge in some areas of the specification remains rather weak in some cases however, details of which are given later in this report.

Most candidates attempted all of the questions on the 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.

Detailed knowledge of the application of modern technologies was rather limited in many cases, as was a clear understanding of systems and control technology.

B231 Study of a Manufactured Product and Manufacturing a Product

Folders and Presentation of Candidate's 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.

Centres are also reminded of the 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. In addition, paper folders should have the pages securely fixed inside a cover sheet. Centres should note that 'slide binders' should not be used as these can become detached in the post and do not keep the candidates' work together. If plastic wallets are used, it is important that only one sheet of paper is stored in each wallet and that they are arranged so that papers do not have to be removed to read them. The use of folded sheets of A3 paper should be actively discouraged in these situations. Further details of these requirements are found on page 36 of the OCR Manufacturing Specification (issue February 2010).

Centres are reminded that the purpose of the moderation portfolio is for the candidate to evidence their achievement and to communicate this achievement to the moderator and others. It is, therefore, helpful for each section to identify which part of the assessment criteria it is seeking to address.

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 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. For example, if the work 'convincingly' met the criteria in the top box for 'suggested modifications' yet 'just' met the criteria for 'batch production' in the middle box, the overall mark would be the average of 12 and 5, in other words 8 or 9.

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 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, and 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

Centres are reminded that work for Unit B231 1A 'Study of a Manufactured Product' 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 discernable 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, in B231 1A 'Study of a Manufactured Product,' 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.

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 also to 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.

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 met this criteria, rather than that in one of the other blocks. It is very important that this aspect of the assessment is carried out correctly, and it is encouraging to see centres now providing excellent photographic evidence.

B232 Manufacturing Processes

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.

Comments on individual questions

1 **(a)** This question required that candidates correctly link given manufacturing sectors with a list of associated products and it was generally well answered by the great majority of candidates.

(b) Again generally very well answered, with the majority of candidates being able to name at least one sector not listed in part (a) and to give suitable examples of products produced in those sectors. Marks were lost where candidates failed to name two sectors and two associated products.

2 **(a)** This question was very well answered and simply required candidates to complete a table indicating the correct sequence of stages in the manufacture of a product.

(b) (i) In this question, candidates were asked to identify factors that would need to be considered when selecting materials for making a product. In general, the question was well answered, with the majority of candidates giving suitable responses such as cost, suitability for the product, and material characteristics.

(ii) This question was not very well answered, and a large majority of candidates showed a general lack of knowledge of smart materials. Many candidates failed to correctly name an example of a smart material, and others showed little understanding of the benefits of using a smart material in a product.

3 **(a)** For this question, candidates needed to consider two factors that should be considered when choosing a production method for their product, and give the importance of each factor.

The question was reasonably well answered, with many candidates linking the cost of buying and installing expensive equipment with batch sizes, operator skills and client requirements.

4 **(a)** This question was very well answered with the great majority of candidates being able to explain the importance of making a prototype product prior to full scale production.

(b) Although part (a) was well answered, only a very small number of candidates were able to correctly state a suitable production process for making a prototype.

5 **(a),(b)** These parts of the question were very poorly answered. The great majority of
   (c) candidates showed a marked lack of knowledge of control systems in general, and were unable to identify either a simple input or output device. Very few candidates were able to give an example of the use of an output device in manufacturing.

(d) As with the earlier parts of the question, only a small minority of candidates were able to explain how feedback from a control system could be used to improve product quality.

6 This question concerned the purchase of a CAD/CAM system by a company for its design work.

    (a) Candidates were required to state the benefits to a company of using a CAD system when producing designs and in the main the question was well answered. The majority of candidates gave answers such as: completed drawings can be e-mailed to other departments; drawings can be easily modified; saves storage space; provides for 3D simulations.

    (b) This part of the question focussed on the issues that a company would consider before purchasing a full CAD/CAM system.

        This was not very well answered, with the majority of candidates again focussing only on the CAD aspect of the system.

7 This question required that candidates explain, with the use of suitable examples, how materials and processes used and batch sizes, could affect the quality of a finished product.

    The question was in the main poorly answered with the majority of candidates failing to state even simple examples such as the quality of the raw materials, operator skill levels and computer controlled processes.

8 The question asked that candidates discuss the health and safety implications for a manufacturer when introducing modern technology.

    The question was, in general, very poorly answered, with the great majority of candidates who attempted the question focussing on the effects that it had on the workforce, rather than the effects on the manufacturer.

    As in the past, this question differentiated well across the ability range of candidates.

B233 Real World Manufacturing and Making a Manufactured Product

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Issues and Recommendations Relating to Specific Sections

In Unit B233 3A 'Real World Manufacturing' candidates are required to study the manufacture of a product that they 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.

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 'Making a Manufactured Product' 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 digital photographs and making diaries can be used to good effect for this purpose.

It is hoped that these comments are of use to centres preparing candidates for future assessments. Centres are encouraged to constantly refer candidates to the assessment criteria and to encourage them to focus on these at all times.

B234 Impact of modern technologies on manufacturing

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.

In particular, candidates should focus on 'designing products for manufacture and sustainability'.

Comments on individual questions

1   **(a)**   This question required that candidates correctly link given manufacturing sectors with a list of associated products and it was generally well answered by the great majority of candidates.

       (b)   Candidates were required to select a product from the list in part (a) and state a modern technology used in that product.

            Marks were lost here due to a significant number of candidates misreading the question and choosing to state a modern technology used in the production of the product, rather than a technology that was an integral part of the product.

       (c)   This was generally well answered, with the majority of candidates being able to name a different sector and give an example of a product made in it.

2   **(a)**   This question was generally very well answered, with most candidates being able to name two different processes carried out in a sector of their choice. Where marks were lost, it was most commonly due to candidates naming stages of manufacture rather than manufacturing processes.

       (b)   This question asked candidates to describe quality control techniques that would be applied in their answers to part (a).

            The question was reasonably well answered, with most candidates describing a relevant quality control technique for at least one of the processes they had named. Marks were lost where candidates named a quality control method, but did not relate it to the processes used in part (a) as required.

3   The question required candidates to describe the impact of modern technology on the workforce, the environment and the disposal of products.

    The majority of candidates performed well, with valid answers such as less manual work, need for increased skill levels, lower pollution levels, less waste, re-cycling, re-using and other similar issues.

4   **(a)**   This question related to the use of CAD/CAM in manufacturing, and required candidates to state three factors that a designer would have to consider when using CAD/CAM.

            The question was answered reasonably well, with the more able candidates giving a good range of answers. Other candidates tended to focus only on the CAD part of the answer however, completely missing the real focus of the question.

(b) The majority of candidates were able to give a good range of viable answers relating to the benefits of making a prototype before going into full scale production. The most popular answers made reference to the presentation of final designs to clients, and the ability to test for problems.

(c) Only the more able candidates were able to give a valid explanation of the term 'remote manufacturing', and many candidates chose not to attempt the question at all.

5 (a) This was a straight forward question that required candidates to name a term that could be applied to a product that had failed to meet the specification.

In the main, the question was well answered by the majority of candidates, with responses such as waste and scrap being most frequently seen.

(b) This followed on from part (a) and required candidates to give three ways in which this 'failed product', could affect the company financially.

Most candidates were unable to offer anything other than the cost to the company of replacing the material used in the failed product, but the effects of a poor reputation on sales was also seen from the higher achieving candidates.

(c) This question dealt with the disposal of products and was generally well answered by the majority of candidates. Factors such as the recycling of materials and the re-use of components featured in a number of the better responses.

6 The question asked candidates to give three factors that should be considered by manufacturing companies when they select materials, components and ingredients for their products.

In the main the question was reasonably well answered, with most candidates giving reasonable descriptions of at least one relevant factor. Only the more able candidates were able to give three factors and an adequate description of each.

7 This question referred to a manufacturing company's image in a number of area including Fair trade, Health and safety and Quality standards.

The question was generally well answered by the majority of candidates in the three areas given, although only the more able candidates gave sufficient detail regarding the 'Fair trade' aspect.

8 The question asked for a discussion of the impact of modern technology on the production of waste. Responses to the question were generally rather weak, with the majority of candidates scoring only three marks or less.

Disappointingly, many candidates gave responses referring to the disposal of products after their effective life, rather than waste produced by the manufacturing process. Many candidates felt that the use of JIT, in itself, reduced waste in the process.

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