

Manufacturing

General Certificate of Secondary Education **J505**

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

Examiners' Reports

June 2011

J505/J510/R/11

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This report on the Examination provides information on the performance of candidates which it is hoped will be useful to teachers in their preparation of candidates for future examinations. It is intended to be constructive and informative and to promote better understanding of the specification content, of the operation of the scheme of assessment and of the application of assessment criteria.

Reports should be read in conjunction with the published question papers and mark schemes for the Examination.

OCR will not enter into any discussion or correspondence in connection with this report.

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Chief Examiner's Report

General Comments

Work presented in the controlled assessment units (B231 and B233) generally followed the requirements of the specification closely and some good practice was seen in portfolios presented for moderation. The Assessment Criteria for these units were applied appropriately in the majority of cases when assessing candidates' work, but there were some instances where insufficient evidence had been provided to support the marks awarded.

Candidate responses in the examinations for Units B232 and B234 indicated that the specification content for these units had been generally well covered by most centres. Candidates' knowledge and understanding was somewhat limited in certain areas, details of which are given later in this report.

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 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 centres are urged to encourage candidates to adopt this approach.

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. For paper folders it is helpful to enter this information onto every page, in case pages become detached. With electronic submissions, the details should be provided in the filename of every file.

Paper portfolios should have the pages securely fixed together and have a cover sheet attached. Centres should note that 'slide binders' should not be used, as these frequently become detached in the post and do not keep the candidates' work together satisfactorily. If plastic wallets are used, it is important that only one sheet of paper is stored in each pocket. Further details of these requirements are to be found on page 36 of the OCR Manufacturing Specification (issue February 2010).

Centres are reminded that the purpose of the portfolio is for the candidate to evidence his or her 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, allowing the moderator to understand clearly how the centre awarded their marks.

The comments provided by centres on the record of assessment form URS967/8 were helpful in explaining the reasons behind the marks awarded in many cases. 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

There are some significant differences between the current specification and the previous 'legacy' Manufacturing GCSE. Centres are urged to remind candidates of these differences, especially if exemplar material from the previous specification is used during the project. Centres are reminded that candidates cannot be awarded marks for work that is not covered by the current 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. Firstly, the descriptor that best describes the candidate's work should be identified. Then, a value judgement should be made as to whether the candidate 'convincingly', 'adequately' or 'just' met the criteria statement, and the mark awarded accordingly. This is the approach used by moderators when assessing evidence presented for moderation, and centres are encouraged to adopt a similar approach to their assessment of candidates' work.

In some cases, candidates may meet the criteria at the top level for one aspect and at 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 firm guidance as to how words such as 'wide range' or 'justified' should 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 accordingly. 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 '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, e.g. improvements in plastics production enabling the material to be used to manufacture kettles which, in turn, enabled 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. When assessing cases such as this it is important to consider whether this work can be included for consideration under another section i.e. 'gives a basic explanation of the use of materials and components...' even if the candidate has included the work under a different, incorrect heading.

B231 1B Manufacturing a Product

Candidates are required to select a client brief from the list published in the specification. The work in the unit involves candidates in the design and manufacture of a prototype product to fulfill the requirements of the brief.

Some centres failed to 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 sections, for example an electronic circuit and a casing, then photographs must clearly show all parts.

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 many centres now providing excellent photographic evidence.

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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 their work on this at all times.

B232 Manufacturing Processes

General Comments

In general it was encouraging to see the level of responses in this series of examination. Centres should be commended for encouraging candidates to attempt every question. Candidates are reminded to gauge the response based on the number of lines provided and the number of marks attributed to the question. Candidates should be reminded that the responses to the free response questions should be concise and relevant, and they would benefit from practice using past papers to prepare for this style of question.

Comments on individual questions

1(a)

Candidates are expected to have a basic knowledge of all the manufacturing sectors, and products produced in each. This is a familiar style question that requires a line to be drawn between the product and its relevant sector. In some cases, candidates had obviously hurried their responses, resulting in either simple errors or crossings out. Candidates generally performed well with this question.

1(b)

Candidates need to make sure they read the question carefully, as the question asked for "sectors NOT shown above". Duplications from 1(a) were quite frequently seen, and some of the products given were not relevant to the sector stated.

2(a)

This question provided candidates with a chart and terms to populate the empty boxes. Candidates are expected to know the sequence of manufacturing stages, and it was rather disappointing to see a number of candidates confusing some of the stages given.

2(b)

Drawing on their own experience, many candidates were able to identify a product and the tools they used to make it. How they used the tool safely was required for full marks. Many of the responses did not relate to the assembly stage however, and candidates are again reminded to read the question carefully before responding.

3(a)

This question was well attempted by the majority of candidates, most giving 1 or 2 factors and their importance, with the more able giving 3. Many candidates were only aware of cost and speed as important factors and were not able to explain why other factors were important when choosing materials.

4(a)

Most candidates were able to state what is meant by the term prototype, but many struggled to give more than one reason for making one in the second part of the question. Presenting to clients for approval was a common response, but the trialing of processes for manufacture was very rarely mentioned.

5(a)

Candidates generally answered this question well, with most being able to identify at least one benefit of using computer controlled machines. The most frequently mentioned benefits made reference to speed of manufacture and a reduction in workforce, but consistency of results was less often seen.

5(b)

Many candidates made reference to robots carrying out dangerous jobs instead of humans. Other areas of reference were not as well covered, however, with working environment and health and safety legislation being very rarely mentioned.

6(a)

This question was well answered in parts (i) and (ii), but candidates often had lost the modern technology focus of the question by part (iii) and this was reflected in the answers. Only a limited number of candidates scored full marks on the question overall.

6(b)

This question was well answered by those candidates who maintained their reference to modern technologies throughout their responses. In some cases, more emphasis was given to the more traditional methods mentioned in the question.

7

The application of control systems is an area that was poorly answered by the majority of candidates. The simple use of sensors to monitor and then automatically adjust quantities, or reject products that do not meet the specification, was only given by a limited number of candidates.

8

A familiar style question allowing candidates to discuss the point raised in detail. It was pleasing to see nearly every candidate attempt this question, with most picking up at least one mark. There were some well developed answers, even when the candidate only made one or two points, but some of the longer responses did not remain relevant to the question. Practice of this style of question would benefit candidates in the future.

B233 Real World Manufacturing and Making a Manufactured Product

Folders and Presentation of Candidate's Work

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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 centres are urged to encourage their candidates to do this.

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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 firm guidance as to how words such as 'wide range' or 'justified' should always be interpreted. 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 accordingly. 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 3A Real World Manufacturing

Candidates are required to study the manufacture of a product chosen from the list published in the specification, giving details of the stages involved.

For candidates to perform well in this unit they should provide details of the materials and components used in the production of their selected product. Justification of the selection of the materials and components should be included by candidates in order for them to gain maximum marks in this section.

Candidates are expected to identify and explain the impact of modern technologies when manufacturing their chosen product. When carrying out work on this topic, candidates should identify and explain a range of modern technologies. The impact of modern technology must be related to the product studied and not simply discussed in general terms.

Unit B233 3B Making a Manufactured Product

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 e.g. through diaries.

Many candidates failed to give details of how the manufacture of their product would be modified in real world manufacturing. 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 and that generic coverage of quality control or health and safety issues is not sufficient.

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 their work on this at all times.

B234 Impact of modern technologies on manufacturing

General Comments

In general it was encouraging to see the level of responses in this series of examination. Centres should be commended for encouraging candidates to attempt every question. Candidates are reminded to gauge the response based on the number of lines provided and the number of marks attributed to the question. Candidates should be reminded that the responses to the free response questions should be concise and relevant, and they would benefit from using past papers as practice to prepare for this style of question.

Comments on individual questions

1(a)

Most candidates did well with this question. Candidates are expected to have a basic knowledge of all the manufacturing sectors, and products produced in each. This is a familiar style question that requires a line to be drawn between the product and its relevant sector. In some cases, candidates had obviously hurried their responses, resulting in either simple errors or crossings out.

1(b)

Candidates need to make sure they read the question carefully, as this question asked the candidates to select a sector from the list in part (a). Some candidates had difficulty identifying how the modern material, component or ingredient was used in products.

2

Most candidates answered the first part of this question well, giving details of two different manufacturing processes used in the chosen sector. In the second part of the question however, many candidates struggled to identify modern technologies relevant to the processes they had identified.

3(a)

Most candidates attempted all parts of this question, but with varying success. Candidates were good at identifying the impact of modern technologies on health and safety and product quality, but found difficulty relating it to materials.

4(a)

Candidates answered this question well, giving a number of benefits to a designer of using CAD. The most popular responses referred to the ease of making changes to designs, and the ability to send designs by email, but only a limited number of candidates considered the ability to produce 3D images and animations.

4(b)

Many candidates were not able to describe the process of making a prototype. Candidates would be more successful if the link between CAD and the CAM system were more clearly understood and described.

4(c)

Many candidates were aware of benefits to manufacturers of using CAM and answered the question well. The fact that a smaller workforce is needed was frequently referred to, but consideration of product consistency was less common.

5(a)

Most candidates were able to score 2 or 3 marks on this question by relating the symbols to the descriptions given in the chart. The symbol for inspection (Symbol 3) was the one that was least often correctly identified.

5(b)

It was of particular note that many candidates were able to identify the use of the chart to reduce waste in processes, and centres should be commended for their coverage of this part of the specification.

5(c)

Candidates identified the benefit of quality checks but the importance of them in process quality control was not present. Candidates are again reminded to read the question carefully, as a number of irrelevancies appeared in responses to this question.

6(a)

Most candidates answered this question in terms of selling products around the world. Explanations were generally quite weak however, and factors such as the global sourcing of materials and components were very rarely considered at all.

6(b)

This part of the question was answered more thoroughly by most candidates, with reference to international competition and the loss of local jobs being frequently made. Some candidates also identified the possibility of delays, and the environmental impact of materials travelling large distances.

7(a)

This was attempted by most candidates, but with limited success in many cases. There was some confusion between recycling and end of life disposal, and the 'material choice' element was not always answered with reference to reducing manufacturing waste.

8

A familiar style question allowing candidates to discuss the point raised in detail. It was pleasing to see that most candidates attempted this question, with most picking up at least a mark. There were some well developed answers, even where the candidate only made one or two points.

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