

Manufacturing

General Certificate of Secondary Education **J505**

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

Examiners' Reports

January 2011

J505/J510/R/11J

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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.

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Chief Examiner's Report

Responses to questions in the Unit B232 and B234 papers indicated that candidates had generally been well prepared for the examinations, although the depth of knowledge in some areas of the specification remains rather weak in some cases.

In both units, most candidates attempted all of the questions on the paper but, in some cases, questions with no response indicated gaps in candidates' knowledge and understanding. There was some evidence of candidates not having read questions carefully before answering. Entries for the Controlled Assessment units were low this session, with only Unit B231 having candidates submit work for moderation. Centres are reminded that the focus of the work selected by candidates for Controlled Assessment units must be based on the lists provided in the OCR GCSE Manufacturing Specification.

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 do this.

Centres are also reminded of the OCR requirements when submitting work for moderation, particularly the need to clearly identify each piece of work with Centre Number and Candidate Number. For paper folders it is preferable to enter this information onto every page, in case pages become detached. 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 frequently become detached in the post and do not keep the candidates' work together securely.

With electronic submissions, whether on CD or through the OCR Repository, centre and candidate details should be included in the filename of every file. Further details of these requirements are found on page 36 of the OCR Manufacturing Specification (issue February 2010).

General Issues and Recommendations

Centres are reminded of the notes of guidance for use of the 'Best Fit' approach to marking grids 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 criterion statement, and the mark adjusted up or down accordingly. This is the approach used by moderators when assessing evidence presented by centres and, if centres ensure that the process is followed also, moderation will be easy to achieve.

In some cases, a candidate may meet the criteria at the top level for one aspect and, say, the 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 band for 'suggested modifications' yet 'just' met the criteria for 'batch production' in the middle band, the overall mark would be the average of 12 and 5, in other words 8 or 9.

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. The context and type of product must always be taken into account when deciding what constitutes a 'range' or a 'wide range'.

If 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'. Again, 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 their development, 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.

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, 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.

Many candidates failed to provide good evidence for the making of a prototype of their design solution in Unit 231 1B. Some Candidates used only one photograph, taken from a distance, so that it did not show any detail. 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. If the prototype contains several different sections, for example an electronic circuit and a casing, then photographs must clearly show both parts. It is most important that photographs included in the portfolio are of sufficient size and quality to give a clear indication of the work produced.

It is hoped that these comments are of use to centres preparing candidates for future assessments, and further guidance will be issued following each examination series, based on issues particularly prevalent at the time.

Written Examination Papers

Unit B232 Manufacturing processes

- 1(a)** Most candidates did well in this question. Candidates are expected to have a basic knowledge of all the manufacturing sectors, and products produced in each. Candidates should read through all of the products before starting to draw the links.
- 1(b)** Candidates need to make sure that they read the question carefully, as the question asked for "sectors notshown above". Candidates should be aware of a number of products made in each sector.

- 2(a)** Drawing on candidates' own experience, many 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. Some also wrote the name of a component rather than a process.
- 2(b)** Some candidates struggled to identify how the product would be produced in the real world. Candidates need to be aware of how industry would carry out some basic processes.

- 3(a)** This question was well answered by most candidates. Candidates were able to identify modern materials and their applications easily.
- 3(b)** This was typically answered quite well, although some were unaware of the difference between modern and smart materials. Some candidates knew the term "smart" but were unable to give an example.

- 4(a)** Most candidates picked up some marks on this question. Quality checking is obviously something that they are familiar with.
- 4(b)** Most candidates know what a quality check is, but not all of them know why it is important, or the commercial reasons why companies carry out quality checks.
- 4(c)** A significant number of candidates were unable to identify how modern technology can be used in quality checks or the importance of quality itself.

- 5(a)** Most candidates did well on this question, although in some cases the stages were entered in the wrong order.
- 5(b)** Application of modern technologies to the presentation of design ideas was answered well, although the prototyping section was not as well covered.

- 6** Parts (a) and (b) were answered well by the majority of candidates. In part (c), however, some candidates lost marks by repeating points from the table or re-phrasing the same points.

- 7** Many candidates answered parts of this question well, although the disadvantages of bought-in components were not as well understood. The factors affecting a 'make versus buy' decision did not come across at all well.

- 8** A familiar question style allowing candidates to discuss the point raised. It was pleasing to see nearly every candidate attempting this question, with most picking up at least one mark. There were some well developed answers, although a number of candidates made only one or two points.

B234 Impact of modern technologies on manufacturing

- 1(a)** Most candidates did well in this question. Candidates are expected to have a basic knowledge of all the manufacturing sectors, and products produced in each. Candidates should read through all of the products before starting to draw the links.
- 1(b)** Candidates need to make sure that they read the question carefully as this question asked for "sectors shown above". Not all candidates gave valid modern technologies used in the given products.
- 2** Some of the candidates struggled to identify a material or ingredient development. To enable candidates to describe improvements and benefits of modern technologies, they need to be aware of the traditional methods of manufacture or production. Lack of this awareness obviously had an impact on them then describing any changes brought about.
- 3(a)** Most candidates answered this part of the question correctly. Interpretation of simple graphs and tables is often a feature of these examination papers.
- 3(b)** Many candidates were unaware of some of the energy uses in distribution. Often candidates focused on design or manufacturing and dispatch, but distribution was not covered in detail. Candidates were required to suggest energy reduction techniques and should be aware of the use of simple energy monitors for checking levels of energy consumption in machines. Maintenance or the purchase of new machinery could then be used to reduce energy use.
- 3(c)** Most candidates named 2 or 3 green energy sources.
- 4** The focus of this question was how modern technologies are used. Many candidates were able to describe benefits to designers, but were less aware of the other areas. Manufacturing has benefited from better quality, levels of control, safety and autonomy. The workforce has benefited from better working conditions, safety, and less physical, more technical roles.
- 5** Many candidates attempted this question but failed to identify wastes, having a tendency to describe benefits rather than wastes. Waste in design can be reduced by auto-checking of models and tooling paths using CAD/CAM. Manufacturing wastes can be addressed by reducing any of the seven wastes from a production area. Scrap reduction is probably the simplest to describe.
- 6** Candidates were aware of at least one of the terms. The difference between standard components and common fixing strategy was sometimes unclear and lead to repetition. Standard components are fitted across different products or used multiple times in one product to reduce R&D and handling costs. Common fixing strategy looks at using the same fixings multiple times to reduce tool change-overs.
- 7** Some candidates were unable to identify impacts on the different areas, instead describing benefits of each to a manufacturer. Modern technology is the main topic, and its impact on all aspects described in the specification.
- 8** A familiar question style allowing candidates to discuss the point raised. Many candidates did not appear to understand the term 'remote manufacture'.

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