

GCSE

Manufacturing

General Certificate of Secondary Education **J505**

General Certificate of Secondary Education (Double Award)
J510

OCR Report to Centres June 2017

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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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B231 Study of a Manufactured Product and Manufacturing a Product

General Comments:

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 best practice to present folders in this way and centres are urged to encourage candidates to do this.

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

Centres should note that slide binders or paper clips should not be used for securing candidates work, as these can become detached in the post and do not keep the candidates' work securely together. Further details of these requirements are found in the OCR Manufacturing Specification.

Centres are reminded that the purpose of the moderation portfolio is for the candidate to evidence her or his achievements 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 the evidence is seeking to address. If this process is followed, it is easy for the moderator to understand how the centre awarded their marks and should result in a straightforward moderation and assessment process that can be clearly understood by candidate and centre alike.

The comments provided by many 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 specification and work must be clearly identified and aligned to a particular section of the specification. The OCR specification includes notes of guidance for use of the 'Best Fit' approach to marking. This can be found in section 4.3. Marking should be positive, rewarding achievement rather than penalising failure, and centres should adopt the approach described in section 4.3 of the Specification. Firstly, the descriptor that matches 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 adjusted up or down accordingly. This is the approach used by moderators when assessing evidence presented by centres and, if centres ensure that this same process is followed, it will ensure that reliable 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 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 should not submit work for assessment if it fails to meet this requirement.

Certain words and phrases used within the marking criteria sometimes cause questions to be raised. It is not possible to give precise, generic guidance as to how phrases such as 'wide range' or 'justified' should always be interpreted. The context and type of product being studied 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 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 both parts.

Centres are encouraged to make use of digital media devices such as a Smartphone when collecting evidence. Short video clips can provide very effective evidence of pupils using tools safely and can also really enhance the evidence when assessing the quality of the finished product.

If a centre awards marks against the criteria statement 'The candidate makes a complete, high quality prototype of the design solution', moderators must be presented with enough evidence to determine that the work met this criteria, rather than that in one of the other blocks such as 'The candidate makes a complete, quality prototype of the design solution' or 'The candidate makes a prototype of the design solution.' It is very important that this aspect of the assessment is carried out correctly and it is encouraging to see many centres providing excellent photographic evidence.

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 to be achieved e.g. improvements in plastics production enabled 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.

It is hoped that these comments are of use to centres preparing candidates for future assessments. Centres are encouraged to refer candidates to the assessment criteria and to encourage candidates to repeatedly focus on this as their work progresses.

B232 Manufacturing Processes

General Comments:

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

Questions relating to manufacturing sectors and products were generally well answered by candidates, but knowledge of the use of modern technologies in manufacturing appeared to be rather limited. This was also the case with regard to the various forms of supply of materials for manufacturing.

Specific examples and details of these points are given later in this report.

Comments on Individual Questions:

- 1(a)(i)** This question was generally well answered and many candidates scored full marks on it. There was also an improvement in the accuracy in naming the sectors compared to previous series.
- 1(a)(ii)** Most candidates were able to give examples of products made in the sectors named in part (i) although, in a few cases, only one example was given.
- 1(b)** Fewer examples of modern technology were given in the responses to this question than would be expected. Candidates tended to give vacuum forming and injection moulding as examples, with appropriate modern technologies being limited to “Robotics” or CAD.
- 2(a)(i)** In many cases, the materials given in response to this question could not be accepted as modern, with ‘aluminium’ and ‘plastic’ appearing quite frequently. Higher achieving candidates did give appropriate examples such as Kevlar and carbon fibre, but only half of the total candidature was awarded the mark for the question.
- 2(a)(ii)** This question was rather more successfully answered, with most candidates scoring one mark or more on it. Where candidates had given an inappropriate example in part (i), an error carried forward (ecf) mark was awarded for an acceptable description of its use in the product.
- 2(b)(i)&(ii)** Despite these two questions being designed to be particularly accessible to lower ability candidates, it would appear that the question instructions were not read carefully enough in some cases. This resulted in an incorrect approach to answering the questions, with candidates merely using a term from the list as their response, e.g. “Solid” or “Granular”, instead of naming a material /ingredient as required. In part (ii), where examples of liquid materials/ingredients were asked for, a number of candidates gave examples of products such as ‘Coca-Cola’ rather than actual materials or ingredients.
- 2(c)** This question was quite well answered generally, with most candidates scoring at least one of the two marks available. Responses usually were related to the use of appropriate PPE, and the higher achieving candidates gave fully justified responses that included

reference to the need for its use, such as wearing strong gloves when handling thin sheet metal.

3(a) Most candidates were able to give at least one reason for using moulds in manufacturing, but only a limited number gave two reasons that were relevant. Where marks were awarded, these were normally for references to accuracy and consistency, and occasionally one mark was awarded for two simplistic statements, provided that these had at least some relevance.

3(b)(i)&(ii)

Many of the tools and items of equipment given as responses to part (i) were more appropriate to manufacturing than to quality control, laser cutters and even hammers being examples of this. The use of robotics and scanners was mentioned in the better responses, and these were normally followed by an acceptable description of their use. The award of an ECF mark for part (ii) was made where possible.

3(c) This question was well-answered by many candidates, with references to loss of sales and/or reputation frequently being made. Only the higher achieving candidates showed fuller understanding by realising that faulty products would have to be made again, at cost of both time and money to the manufacturer.

4(a) Few candidates scored well on this question, mainly due to the fact that responses were often related to finished products rather than the specification phase of the design cycle. As a result, candidates were limited to only one or two of the four marks available, where it was possible to award any marks at all.

4(b) Rather surprisingly, a number of candidates did not attempt this question on the use of information, communication and digital technologies in sharing designs with clients. Some good responses were seen, however, and marks were gained by candidates giving justified descriptions of the use of technologies such as CAD and emails. Most candidates scored at least two of the three marks available for this question.

4(c)(i) A limited range of examples of modern technologies used for making prototypes was seen, by far the most popular choice being 3D printing, but in a significant number of cases, candidates merely stated 'CAD'.

4(c)(ii) This question was quite poorly answered, with most candidates scoring only one mark for overly simplistic responses. One ECF mark for this part of the question was again awarded where possible.

4(d) Only a small number of candidates scored two marks or more on this question, this often being due to candidates showing little understanding of the term 'full scale production'. Many candidates suggested that the products being made would simply be bigger than the prototype, and only the higher achieving candidates made any reference to the possibility of a change in material used, or the application of high-volume production methods.

5(a) Most candidates were able to give at least one relevant factor for manufacturers to consider when introducing new products, with references to the cost of new equipment and the need for more staff frequently being seen. Where responses were particularly simplistic, these were awarded marks only if the meaning was sufficiently clear.

5(b) Only the higher achieving candidates gave appropriate responses to this question, with many others missing the focus of the question on new materials or ingredients.

- 5(c)(i)** Over half the total number of candidates scored no marks on this question, with some making no response at all. Where marks were gained, this was normally for quite simple reference to the use of PPE that was appropriate to the production methods employed.
- 5(c)(ii)** Candidates' understanding of market needs was very limited and marks awarded for this question were low. Only the higher achieving candidates gave justified descriptions worthy of full marks, and many simplistic responses referring to speeding up production were seen.
- 6(a)(i)** This question was generally well answered, with most candidates scoring full marks for two valid factors to consider when choosing a supplier. Occasionally one mark was awarded for two simplistic statements, provided that these had at least some validity.
- 6(a)(ii)** A number of good responses to this question were seen, particularly those relating to the hygienic storage of ingredients for food products. In some cases, however, responses were not suitably justified, resulting in only one of the two marks being awarded.
- 6(b)** Most candidates attempted this question, but few good responses were seen. Most responses indicated that candidates had little understanding of the influence of the availability of materials on the amount of stock held by manufacturers, and many simply suggested that the more available it was, the more stock the manufacturer would hold. In a few cases, candidates related their responses to the storing of finished products rather than materials.
- 7(a)(i)&(ii)** Responses to the two parts of this question were very varied, many showing confusion between what was an input device and what was an output device. Less than half of the candidates were able to identify switches or buttons as appropriate input devices for part (i), and in part (ii) many candidates repeated the example of a lamp from the question. In general, better answers were given for part (ii), but overall responses to the question were disappointing.
- 7(b)** A significant number of candidates did not even attempt this question and marks gained on it were very low. Only the higher achieving candidates scored two marks or more by demonstrating some understanding of the relevance of forms of supply of materials to manufacturing processes used.
- 8*** A number of candidates did not attempt this question, and the responses that were seen suggested a rather limited understanding of the impact of modern technologies on the design of new products. In many cases candidates deviated from the focus of the question and related their responses mostly to the more general benefits of using modern technologies, particularly in manufacturing, making references to the use of CNC and CAM. Better responses gave some detail of the use of CAD, 3D imaging and rapid prototyping when designing and developing new products, but on the whole responses were quite disappointing.

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

OCR (Oxford Cambridge and RSA Examinations)
1 Hills Road
Cambridge
CB1 2EU

OCR Customer Contact Centre

Education and Learning

Telephone: 01223 553998

Facsimile: 01223 552627

Email: general.qualifications@ocr.org.uk

www.ocr.org.uk

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Head office
Telephone: 01223 552552
Facsimile: 01223 552553

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