

Engineering (Double Award)

General Certificate of Secondary Education **J322**

General Certificate of Secondary Education (Double Award) **J344**

OCR Report to Centres

June 2012

OCR (Oxford Cambridge and RSA) is a leading UK awarding body, providing a wide range of qualifications to meet the needs of candidates of all ages and abilities. OCR qualifications include AS/A Levels, Diplomas, GCSEs, OCR Nationals, Functional Skills, Key Skills, Entry Level qualifications, NVQs and vocational qualifications in areas such as IT, business, languages, teaching/training, administration and secretarial skills.

It is also responsible for developing new specifications to meet national requirements and the needs of students and teachers. OCR is a not-for-profit organisation; any surplus made is invested back into the establishment to help towards the development of qualifications and support, which keep pace with the changing needs of today's society.

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.

© OCR 2012

CONTENTS

General Certificate of Secondary Education

Engineering (J322)

General Certificate of Secondary Education (Double Award)

Engineering (J344)

OCR REPORT TO CENTRES

Content	Page
Overview	1
A621 Engineering Product (Controlled Assessment)	2
A622B Engineering Processes (CBT and Written Paper)	6
Unit A623 – Real World Engineering/Making an Engineered Product (Controlled Assessment)	9
Unit A624 – Impact of Modern Technologies on Engineering (Written Paper)	13

Overview

General Comments

Candidate responses in the examinations for Units A622 and A624 indicated that the specification content for these units had been generally well covered by centres. Candidates' knowledge and understanding was somewhat limited in certain areas however, details of which are given later in this report.

Work presented in the controlled assessment units (A621 and A623) followed the requirements of the specification closely and good practice was seen in a number of portfolios presented for moderation. The Assessment Criteria for these units were applied appropriately in the majority of cases when assessing candidates' work.

A621 Engineering Product (Controlled Assessment)

When work is submitted for Unit A621, it would be helpful if it was securely bound, with individual pages clearly visible and not all inside a single plastic wallet. Good practice was evident in the use of numbered pages and division of work into sections following the assessment grid descriptors. Where this was done, page references could then be entered on the Unit Recording Sheet (URS) to direct the moderator towards evidence supporting the marks awarded.

When using the assessment grids, it is important that centres consider the introductory requirement at the beginning of each section. In the first column on the assessment grid a basic description or explanation may include brief notes or a list of key words. For candidates to progress to the second column they must describe and explain their work, and should use more text in order to present their findings and show their knowledge and understanding of the topic being covered. Candidates who are awarded marks from the third column of the assessment grid must add further detail to their descriptions and explanations as well as justifying the information provided.

Centres that produce writing frames or pre-populated work sheets in order to guide candidates towards meeting the requirements of the assessment criteria should use these with caution. Whilst they may support some candidates, there is a danger that the performance of more-able candidates might be restricted. This is particularly the case where the writing frames cannot be expanded by candidates to develop, explain and justify their work.

Unit A621 1A Study of an Engineered Product

Candidates submitting work for this element must select a product from the list given by OCR. The chosen product should then be analysed, together with two other similar products that have been developed over a period of time using more modern technologies.

In general, work presented followed the requirements of the specification, with a range of products being studied by the candidates. Good practice saw candidates studying the development of the three similar products at identified periods in time, maybe at ten year intervals or longer gaps depending upon the product selected from the OCR list. By following such a procedure it was easier for candidates to identify developments in materials, components and technology.

A621 1A Section 1

It is important that candidates analyse each of the products identified and give consideration to the impact of modern technologies, smart materials and components on their development. Modern materials, smart materials and components should be relevant to the products studied and not simply presented in generic terms. A generic introduction may be acceptable as a starting point, but it should then be developed with reference to the product and its evolution.

Candidates should present written evidence to show that they have considered the advantages and disadvantages that the use of modern technology has brought to society. Once again, this aspect must relate to the product being studied and should describe how it has benefitted from advances in technological development.

Good practice was evident where candidates had broken down each of the requirements of this section and addressed them as separate topics, presenting the information in written format or as a table. Images of the selected products were provided in order to support the information given.

A621 1A Section 2

In this section, candidates should explain the use of materials and components in their selected products. This should include reference to properties, characteristics, performance and cost.

When attempting this piece of work, it may be to the candidate's advantage to address materials and components in two separate parts. Part one might cover the analysis of appropriate materials and their relevant properties, characteristics, performance and cost, with part two following a similar approach but with reference to components.

Good practice for this section saw candidates identifying, explaining and justifying a range of different materials and components that have developed over a period of time. Information was presented in the form of a table that identified materials and components that could be used in the product, and explained their properties, characteristics, performance and cost.

A621 1A Section 3

In this section, candidates are expected to identify, explain and justify engineering processes that could be used in the production of their selected products, and it is important that candidates do identify and explain a range of processes. In the samples moderated, many candidates had been awarded high marks for this section but had only identified, and briefly explained, two or three processes. It is important that a range of relevant processes are included and that an explanation is given as to how each process is carried out stage by stage. The presentation of images to support this information can often be beneficial.

Good practice was shown by candidates who identified and explained a range of different engineering processes. Information and images were used to help explain a variety of engineering processes that had been used over a period of time as the selected product had evolved.

A621 1A Section 4

Candidates are expected to suggest modifications that could be carried out on the selected product so that the needs of present and future users are met. The use of modern technology in the development of the selected product should be considered. The information in this section could allow candidates to do some 'crystal ball' thinking and give their opinions of how the product studied may develop in the future. Reference to design concept ideas may be a good starting point for this element.

Sustainability issues should be explained and evaluated. When carrying out work on this topic, issues such as recycling, selection of materials and resources, and other green issues should be considered, with information recorded and presented. This is not an opportunity to talk purely about the benefits of sustainability and "green issues", as the information presented must relate to the product studied.

Good practice in this section saw candidates dividing their work into two parts, one addressing modifications to the design solution and the other dealing with sustainability. In a number of cases, images were used to support written explanations.

Unit A621 1B Engineering a Product

Candidates submitting work for this element are required to design and make an engineered product to meet the needs of a client brief selected from those listed in the specification. The outcome of this part of the unit should be a high-quality prototype of the design solution.

Unit A621 1B Section 1

Candidates working on this section must select a client design brief from the list given by OCR. Once a design brief has been selected, it should be analysed and researched, and a specification produced which identifies the key points of the product. The specification should be more than a simple list of keywords or bullet points, and each point should be explained and justified. The specification should be referred to, and comments recorded, during the design stage.

Many of the coursework folders presented for moderation did not contain any input from a client or, in some cases, the input had been limited.

Good practice saw candidates analysing a design brief, carrying out relevant research on the topic, analysing existing items, and then presenting a revised specification. The specification was then used and referred to in the following section, where the candidate presented a range of ideas that met the client's requirements.

Unit A621 1B Section 2

Candidates are expected to present a range of different ideas that will answer the client brief and meet the requirements of the specification. Ideas should be presented using a range of techniques, including annotated sketches, 3D views and engineering drawings that meet current industry standards.

Once suitable solutions have been developed, a final product should be selected and the reasons for its choice explained and justified. The final idea should be presented to the client and feedback sought. Candidates should give evidence of responding to the feedback, with any changes made being explained and justified.

Many folders presented for moderation provided only a limited range of ideas, with many ideas being similar to each other, and limited development of ideas was seen. Design ideas should be cross-referenced to the points made in the specification. This can be achieved by the annotation of drawings or a table where drawings are numbered and given a rating against key points from the specification. Some candidates failed to feature a presentation of the final idea or, when it was included, it lacked feedback from a client regarding its suitability and how it met initial needs.

Good practice saw the presentation in folders of a wide range of ideas, with annotation referring to key points from the specification. These ideas were developed to include notes on materials, construction details and components. A final idea was then selected, drawn using a variety of techniques including CAD, and evaluated before being presented to the client.

PowerPoint slides may be used for the client presentation, in which case thumbnails should be included in the folder. Comments made by the client should be recorded, with further modifications presented, explained and justified.

Unit A621 1B Section 3

In this section, candidates are required to produce a high-quality prototype of the final idea and provide photographic evidence of its completion.

The majority of candidates did include a photograph of their product, but it would be beneficial if several photographs of the product were included in the folder to show different views, different angles and close-ups. In the sample of folders seen during the moderation process it was difficult, in some cases, to judge the quality of candidates' work as single photographs were presented or the quality of the photographs was poor.

Unit 621 1B Section 4

Candidates working on this section should show evidence that they have selected and used a wide range of appropriate materials, components, processes, tools and equipment. They should also appropriately apply and explain a range of quality control techniques.

Attention is drawn to the fact that witness statements are not acceptable for health and safety issues or quality control procedures. The candidate should provide his/her own evidence for these elements through the use of text, photographs, or a log of events.

Centres should note that it is no longer a requirement of this specification for candidates to explain the use of ICT or its benefits in the production of the product. It may be felt by some that this information is relevant to the product being produced and can be included, but it will only add to the time that the candidate spends on the unit, with no additional marks being available for it.

Good practice in the folders moderated saw candidates using production plans that identified health and safety issues and quality control checks. Such information was not generic but was related to the product being produced and detail was given as to what the checks would be, how they would be carried out and why they were necessary. Evidence was presented showing that candidates had carried out or applied risk assessments on equipment to be used. Good use was made of photographic evidence to support safe practice and to highlight quality control checks. It must be noted, however, that when photographs are used to support health and safety issues, the candidate must follow the required procedures. A number of the photographs seen in folders showed candidates using machines without goggles, apron or appropriate holding devices.

Unit 621 1B Section 5

In this section, candidates should detail and justify modifications that could be made to the design solution. They should include consideration of the use of modern materials, processes and technologies.

Good practice was evidenced by candidates who used diagrams and modelling to suggest and explain modifications to their final product. Such modifications not only suggested how the design of the product could be modified, but also considered alternative production methods, the use of 21st century equipment and smart materials.

A622B Engineering Processes (CBT and Written Paper)

General Comments

Most candidates attempted all of the questions on the paper but, in some 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.

Questions relating to Health and Safety issues were generally well answered, and knowledge of basic engineering materials was reasonably sound. This was not the case with the more modern materials, however, with confusion between 'modern' and 'smart' materials being apparent in many responses.

Detailed knowledge of engineering components remains limited in many cases, as does a clear understanding of the application of quality control techniques in the manufacture of engineered products.

Comments on Individual Questions

- 1(a)** Candidates are familiar with this style of question, and all but a very small number gained full marks on it. In the few cases where marks were lost, it seemed that candidates may have completed links by guesswork.
- 1(b)** The majority of candidates were able to name two different engineering sectors and a product made in the sector. Where marks were lost, this was usually as a result of repeating a sector from part (a) as one of the examples.
- 2(a)** This question was well answered, and virtually all candidates gained full marks for it, except where only one of the two items asked for had been identified.
- 2(b)** Responses to this question were very mixed, with marks awarded ranging from zero to full marks. Most responses made some reference to the heat of the soldering iron, but in some cases precautions associated with heavy machinery were also given. Only the higher achieving candidates gave detailed responses that referred to issues such as ventilation and lead-free solder.
- 2(c)** This question was quite well answered, with most candidates being able to give at least one check made to ensure that engineered components meet the specified tolerance. Although all appropriate types of checks were accepted, marks were sometimes lost where a simplistic response gave insufficient information about the check.
- 3(a)** Although most parts of this question were answered correctly, a significant number of candidates gave copper as an alloy. Marks were allowed for a correct second use of a material, such as phosphor bronze as a non-ferrous metal and an alloy. In a number of cases, it appeared that candidates had limited real knowledge of materials, and had answered the questions mostly by guesswork.

- 3(b)** Most candidates stated that an alloy is a mixture of metals, but few gained full marks for this question, as most responses failed to explain the meaning of the term clearly. Only the better responses made reference to the improvement in properties/characteristics gained by making the alloy.
- 3(c)** As with part (b), only a few candidates referred to the improvement in characteristics, although most knew that a composite was a combination of different materials.
- 4(a)** Responses to this question were mixed and a number of candidates did not even attempt it. In the majority of cases, candidates had named an engineering process rather than a manufacturing stage as asked for in the question.
- 4(b)** Most candidates scored at least one mark on this question, but only a limited number gave a suitable description of a quality control technique. A significant number of candidates referred to a specific quality control check, such as checking dimensions, and some credit was given where these responses were sufficiently relevant for a mark.
- 4(c)** Responses to this question were quite disappointing, with only a limited number of candidates gaining full marks. The most frequently seen correct responses referred to cost and the need for corrosion resistance, but most candidates were only able to give one factor to consider.
- 4(d)** This question was generally well answered and only a small number of candidates failed to score any marks on it. A number of responses showed clear understanding of the benefits of following health and safety procedures, making reference to such issues as improvements to company reputation and workforce morale.
- 5(a)** The majority of candidates were able to give an example of a joining process and an assembling processes, but those relating to heat treatment, and particularly chemical treatment, were less well known. Only the more able candidates appeared to recognise the fact that chemical treatment can include processes used for surface finishing.
- 5(b)** Both parts (i) and (ii) were quite poorly answered and very few candidates scored full marks in either of them. In most cases the distinction between 'modern' and 'smart' materials was not clearly understood, and often the inclusion of an appropriate example was not made.
- 6** In a number of cases, responses to this question suggested that detailed knowledge of engineering components was rather limited. Most candidates gave reasonable responses for one or two components, but a significant number did not attempt a third. The most frequently chosen components were the LED, the chain drive and the cold rivet, but explanations of their function were often lacking in detail. Where candidates had attempted a response, a suitable example of the component's use was normally given.
- 7(a)** All but a very small number of candidates correctly identified material B as offering the best value for money.
- 7(b)** This question was generally well answered, with the majority of candidates using the information in the table to give two reasons why material C might not be suitable for the manufacture of a prototype. Most responses gave the fact that it was not easy to store or handle as reasons, and the poor availability was also considered to be a factor.

7(c) This question was less well answered than part (b) and only a limited number of candidates scored full marks on it. In many cases candidates had tried to bring in all of the factors in the table, with the result that their response was confused and incoherent. Other candidates repeated much of their response to part (b) and failed to take into account the fact that bulk buying was the focus of the question.

8* Almost all candidates attempted this question, but a considerable number did not gain many marks, as their responses did not relate to the focus of the question. Candidates were required to relate their response to the quality of engineered products but, in many cases, general points about the use of modern technologies in production were made. References to the cost of setting up CAM and the subsequent loss of jobs were common, and only the higher achieving candidates discussed how the new technologies had affected quality.

Marks for this question were generally quite low, with three marks or less being the norm for a response.

Unit A623 – Real World Engineering/Making an Engineered Product (Controlled Assessment)

When work is submitted for Unit A623, it would be helpful if it was securely bound, with individual pages clearly visible and not all inside a single plastic wallet. Good practice was evident in the use of numbered pages and division of work into sections following the assessment grid descriptors. Where this was done, page references could then be entered on the Unit Recording Sheet (URS) to direct the moderator towards evidence supporting the marks awarded.

When using the assessment grids, it is important that centres consider the introductory requirement at the beginning of each section. In the first column on the assessment grid a basic description or a basic explanation may include brief notes or a list of key words. For candidates to progress to the second column they must describe and explain their work and should use more text in order to present their findings and show their knowledge and understanding of the topic being covered. Candidates who are awarded marks from the third column of the assessment grid must add further detail to their descriptions and explanations as well as justifying the information provided.

Centres that produce writing frames or pre-populated work sheets in order to guide candidates towards meeting the requirements of the assessment criteria should use these with caution. Whilst they may support some candidates, there is a danger that the performance of more-able candidates might be restricted. This is particularly the case where the writing frames cannot be expanded by candidates to develop, explain and justify their work.

Unit A623 3A Real World Engineering

Candidates submitting work for this element must select a product from the list given by OCR. In general, work presented did follow the requirements of the specification, with a range of products being studied by the candidates.

A623 3A Section 1

It is important that candidates analyse the product identified and give consideration to the stages carried out in its production.

Good practice was evident where candidates had broken down the production process, listing the various stages and then explaining each in turn, with information provided in a written format or as a table. Images of the selected stages were provided in order to support the information given.

A623 3A Section 2

In this section, candidates are required to identify, explain and justify a range of engineering processes and quality control techniques that are used in the production of their selected product. A range of processes that could be used in the manufacture of the product should be identified and the stages of carrying out the process explained. A wide range of processes should be covered, the number depending upon the complexity of the product studied, and all the processes should be relevant to the product selected. It is important that candidates consider and explain quality control procedures that may be carried out with each process.

Good practice saw candidates identify and explain a range of different engineering processes. Written information and images were provided to help explain a variety of engineering processes and quality control checks.

A623 3A Section 3

Candidates are expected to provide details of the materials and components used in the production of their selected product. For candidates to perform well in this section they should provide a detailed explanation of the information and not merely a list of key words. The functions, properties and characteristics of the materials and components should be detailed.

A number of candidates successfully divided this section into two parts, with one part dealing with appropriate materials and the second part relevant components. Candidates then explained, analysed and justified materials and components identified, using tables with column headings of function, property and characteristics.

A623 3A Section 4

In this section, candidates should explain systems and control technology used to organise, monitor and control the production of the product. The systems and control technology identified should be related to the product studied and its manufacture, and not be addressed purely in generic terms.

Good practice saw candidates identifying a list of stages and highlighting key systems and stages of production that use control technology in engineering the product studied. Images were often used to support written text, helping candidates to fully explain how the product evolved.

A623 3A Section 5

Candidates are expected to identify and explain the impact of modern technologies when engineering their chosen product. When carrying out work on this topic, candidates should identify and explain a range of modern technologies. They should explain how the use of the modern technologies has changed the production of their selected product and evaluate if such changes are good or bad. In doing this, candidates should consider the effects on production times, workforce, quality, value for money and resources.

Unit A623 3B Making an Engineered Product

Candidates submitting work for this element must select a product from the list given by OCR as a starting point for the project.

Unit A623 3B Section 1

Candidates should analyse the chosen product and produce a production plan for the making of a high-quality prototype of the engineered product.

Good practice saw candidates analysing a design situation and producing a production plan that identified an appropriate sequence of making, suggesting time estimates for each stage. Materials, tools, equipment and processes to be used were highlighted in the production plan. Health and safety aspects as well as quality control checks to be carried out were also included.

Although there is no set way for the production plans to be presented, a popular method makes use of tables, with the stages listed and columns used to identify the aspects mentioned earlier.

Unit A623 3B Section 2

Candidates are expected to produce a prototype which will answer the design situation identified from OCR lists.

The prototype should be produced using appropriate materials and should be able to function as required in order to fulfil the requirements of the design situation. As this product can only be moderated through the use of photographs, it is important that candidates present a range of images. Although the majority of candidates did include a photograph of their product, it would be beneficial if several photographs of the product were included in the folder to show different views, different angles and close-ups. In the folders seen during the moderation process it was difficult, in some cases, to judge the quality of candidates' work as single photographs were presented or the quality of the photographs was poor. This was particularly the case where the photographs were presented as part of a making diary and were too small to be sufficiently clear.

Unit A623 3B Section 3

In this section, candidates are expected to show, explain and justify the use of a wide range of appropriate processes, materials, parts, components, tools and equipment. It is important that evidence is presented in the folder of the candidate's use of tools, equipment and processes as marks cannot be approved for witness statements covering this work.

The information can be presented in a variety of formats, and good practice in many cases saw candidates presenting this information as a log or diary of making. This record was often presented in table form, with columns for photographs of each stage and the tools, materials and equipment used. Further columns gave explanations of why the items used were appropriate, and references to the production plan, identifying and justifying changes that had been made.

Unit 623 3B Section 4

Candidates working on this section should show evidence that they have applied appropriate health and safety procedures. They should also appropriately apply, explain and justify a range of quality control checks that have been carried out during the production of their product. Health and safety procedures and quality control checks should be related to the product being made and not be presented as generic procedures.

Good practice observed in the folders moderated saw candidates using images that supported health and safety issues and quality control checks. Detail was given as to what the quality control checks would be, how they would be carried out and why they were necessary. Health and safety issues were identified and explanations given as to how the user would be protected. Evidence was presented showing that candidates had carried out or applied risk assessments on equipment to be used.

Unit 623 3B Section 5

Candidates should detail and justify modifications that could be made to the design solution. They should include consideration of the use of modern materials, processes and technologies.

Good practice was seen from candidates who evaluated their final product and went on to use diagrams and modelling in order to suggest and explain modifications that could be made. Such modifications not only considered how the design of the product could be improved, but also considered alternative production methods, materials and the use of 21st century equipment and smart materials.

Unit A624 – Impact of Modern Technologies on Engineering (Written Paper)

General Comments

Most candidates attempted all of the questions on the paper but, in some cases, responses seemed to have been hurried and did not always address the questions fully. The importance of effective examination technique cannot be over-emphasised, as there was some evidence of candidates not having read questions carefully before answering.

Candidates' knowledge of quality control techniques was generally quite good, but responses relating to the application of systems and control to engineering processes were again rather disappointing.

Questions referring to Health and Safety were generally well answered, as, in most cases, were those dealing with engineering components.

Comments on Individual Questions

- 1(a)** All candidates attempted this question, and all but a very small number scored full marks on it. Where errors were made, the most common was a result of confusion between the products made in the Electrical and Electronic and Computers, Communication and IT sectors.
- 1(b)** The majority of candidates scored full marks on this question, although some lost marks by repeating sectors named in part (a).
- 2(a)** Although all candidates attempted this question, very few gained high marks on it. The main reason for this was that responses tended not to address the focus of the question, which was the 'range of products being made'. In most cases, candidates had made reference to the more general benefits of modern technologies, such as CAD/CAM and the use of the internet.
- 2(b)** This question was quite well answered in most cases, with candidates referring to the recycling of materials and the application of modern technologies in cars to reduce pollution and the use of fossil fuels. Where marks were lost, this was normally as a result of the candidate not providing suitable examples.
- 3(a)** Most candidates gained full marks in this question by correctly identifying CAD as standing for Computer Aided Design, although a very small number did not offer a response at all.
- 3(b)** This question was quite well answered by most candidates, although some lost marks by naming tools that were not related to drawing. References to scribes and try-squares suggested that candidates were considering marking-out on metal rather than producing engineering drawings.

- 3(c)(i)** This question was well answered by almost all candidates, with the use of emails being by far the most popular response.
- (ii)** Most candidates scored well on this question, giving good descriptions of file saving and attaching to emails. In a number of cases, a mark was lost by missing out the essential stage of attaching the file to the email.
- (iii)** The majority of candidates scored at least one mark on this question and, where the second mark was not awarded, this was normally due to the comparison with traditional methods not being made.
- 4(a)** Most candidates were able to give one benefit of using a sampling technique, but only a limited number gave a second. The most frequently seen response related to the benefit of not having to check every part, but other benefits, such as time and cost savings, were less commonly seen.
- 4(b)** Responses to this question were very mixed, with most candidates either scoring very well or not at all. In a few cases, candidates lost the second mark by failing to give an example in their response.
- 4(c)** This was less well answered than parts (a) and (b), with few candidates scoring marks and a significant number offering no response at all. It would appear that candidates' knowledge of quality control techniques falls short of an understanding of the 'actions' taken as a result of the checks.
- 5(a)** The majority of candidates answered this question correctly by placing the sensor and the buzzer in the appropriate boxes. Only a very small number of candidates lost marks, either by reversing the positions of the components, or by adding other items in the boxes.
- 5(b)** Most candidates were able to give at least one example of a different sensor, but less than half gave two appropriate answers. In a number of cases the second mark was lost by repeating the light sensor from part (a) or by naming an inappropriate item.
- 5(c)** Knowledge of PLCs continues to be very limited, and few good responses to this question were seen. Where a response was given, this usually related to the control of conveyors in packaging areas, but in many cases no example of use was provided.
- 6(i)** The majority of candidates gave a good description of a safety procedure for milling, many making reference to the need to securely clamp work and use machine guards. In a number of cases, however, candidates had failed to recognise the fact that answers were not to include reference to PPE.
- (ii)** It was rather surprising to note how many candidates did not answer this question relating to brazing, and over half of the candidates did not score any marks at all. Only a limited number of candidates made reference to safety procedures such as the checking of equipment and the provision of fire extinguishers in working areas.
- (iii)** Responses to this question were rather mixed and marks were again lost by reference to PPE in some cases. A number of excellent responses were seen however, with candidates showing good awareness of the need for ventilation and extraction when spray painting.

- 7(a)** Most candidates scored full marks on this question but, where marks were lost, it was apparent that candidates had used guesswork to place some of the components. Errors were quite common in the Mechanical and the Pneumatic/hydraulic columns of the table.
- 7(b)** It was quite surprising that a number of candidates did not attempt this question, and that less than half were able to give two examples of systems where a switch would be used. Examples such as heating, lighting and alarm systems were perfectly adequate responses, as were references to different types of machinery.
- 7(c)** A significant number of candidates lost marks on this question by failing to relate their response to the component. A typical example of this was the selection of the cam, followed by a description of computer aided manufacturing in the response.
- 8*** Only the higher achieving candidates scored well on this question, as the majority of responses seen did not address the question content fully. Candidates were required to discuss the effects of systems and control technology on the quality of engineering production, but many candidates simply referred to general effects when modern technologies are used. Most responses contained references to issues such as 24/7 working and loss of jobs, and mention of quality was very rare. This type of question is a very good example of the need for candidates to read questions carefully before attempting a response.

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

For staff training purposes and as part of our quality assurance programme your call may be recorded or monitored

Oxford Cambridge and RSA Examinations
is a Company Limited by Guarantee
Registered in England
Registered Office; 1 Hills Road, Cambridge, CB1 2EU
Registered Company Number: 3484466
OCR is an exempt Charity

OCR (Oxford Cambridge and RSA Examinations)
Head office
Telephone: 01223 552552
Facsimile: 01223 552553

© OCR 2012

