

Examiners' Report/  
Principal Examiner Feedback

Summer 2012

GCSE

Application of Technology in Engineering  
and Manufacturing

Unit 5EM03 Paper 3B

Food and Drink, Biological and Chemical

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## **Unit 5EM03\_3B**

### **Food & Drink, Biological & Chemical**

#### **General Comments**

The paper produced a wide range of responses in both Section A and Section B. Average and lower ability candidates frequently gave generic responses that lacked a full understanding of the sector. Basic responses such as 'cheaper, quicker, easier', were given with little or no explanation, limiting the marks which could be awarded. A number of candidates gave inappropriate answers, suggesting questions had not been read correctly or were not fully understood and as a consequence did not gain marks. The more demanding questions at the end of each section proved difficult for many lower ability candidates where again inappropriate or low level responses were often given.

In Section B there was evidence that a significant number of candidates had not fully researched jam doughnuts and how they are manufactured in sufficient depth, limiting the marks which could be awarded. Automation was generally not well understood. Candidates who had researched and retained the information relating to jam doughnuts and their manufacture and used correct terminology gained marks.

A large number of more able candidates attempted all questions and gained high marks. Lower ability candidates often did not attempt some of the higher level questions. The questions requiring an 'explanation', 'description', or requiring 'discussion' were often answered with low level responses and frequently not fully developed, reducing the marks which could be awarded, especially, to lower ability candidates.

Most candidates would benefit from practicing examination skills and techniques. It appeared that a number of candidates did not read the questions carefully and as a consequence did not fully understand or misinterpreted what was required of them eg gave a disadvantage when an advantage was requested, therefore reducing the marks which could be awarded. Guidance as to what kind of response is expected from particular types of questions, especially those requiring an explanation, description or discussion would also benefit the candidates.

Some candidates did not fully appreciate that the maximum number of marks available and the level of response required were linked again restricting the marks which could be awarded.

Additionally, developing skills relating to discussion topics (ref.Q14) would assist most candidates.

#### **Section A**

##### **Question 1**

1(a) the majority of candidates correctly identified both products belonging to the Food and Drink sector.

1(b) a number of candidates gave an incorrect response eg digital thermometer, recipe book in the Biological and Chemical sector.

## Question 2

2 (a) Table 1 - the majority of candidates correctly named the 'dishwasher', however a significant number were unable to correctly name the 'slicer'.

2 (b) Table 2 - the meanings of the symbols were generally understood by the majority of candidates. However some lower and average ability candidates gave answers that did not expand the meaning enough to gain maximum marks eg 'poison'. Those candidates able to fully develop their response were awarded full marks.

## Question 3

This question was well answered by the majority of candidates, with many gaining full or near full marks. Incorrect responses usually centred on 'Information and Communication Technology' (ICT) and 'Control Technology' links. A few candidates also incorrectly linked 'modern materials'.

## Question 4

For 4(a)(i) the majority of candidates gave correct responses. Products from previous question papers were often used. However a number of candidates also identified items of food which were not manufactured products eg lettuce. A number also identified a food additive or ingredient instead of a product eg flour.

Many candidates produced correct responses for 4(a)(ii) which were clearly linked to Product 1, however some candidates were unable to correctly name or identify an appropriate preservative linked to the named product. Inappropriate materials such as yeast, eggs, flour, glazing agent were sometimes named. A significant number listed random E numbers but without the name.

Part 4(a)(iii) was well answered by some average and more able candidates who knew what a preservative was and were able to give appropriate explanations, making appropriate references to increased shelf life, extended storage time etc. Where the answer 4(a)(ii) was incorrect some candidates followed through with responses not relating to a preservative, but to why the incorrectly named material is used.

Lower ability candidates often gave responses that lacked understanding and included simply naming another product.

For 4(b)(i) a significant number of average and more able candidates were able to state an appropriate manufacturing stage.

Part 4(b)(ii) was generally well answered by those more able candidates who focussed on the stage named in 4(b)(i), many gaining maximum marks. Some lower ability candidates referred to robotics being used in some way with references such as 'don't need a wage' or 'quicker / easier' without a full explanation. A number of candidates stated what was done by machines within a stage but without describing how it was an advantage. Some lower ability candidates made reference to aspects of design, others made general references to robots.

## **Question 5**

5 (a) was attempted by the majority of candidates, with the more able candidates gaining four marks or more. However, some responses lacked significant reference to new product development or efficiency. Generic responses were sometimes given by lower ability candidates and these were not always fully described or contextualised.

5(b) was attempted by the majority of candidates, many were awarded full marks. Responses referred to accuracy, speed, labour, human error, hygiene.

## **Question 6**

For 6(a)(i) a wide variety of responses were given, but were not always supported by an appropriate description. Well answered by the more able candidates however lower ability candidates were unable to describe the term electronic mail fully.

Most candidates attempted this part 6(a)(ii). More able candidates giving appropriate, wide ranging and detailed explanations and were awarded full marks.

6(b)(i) the majority of candidates attempted this part of the question with many naming an appropriate traditional method.

6(b)(ii) many candidates attempted this part of the question and the more able gave detailed, well developed responses, often referring to costs, time, travel. Some candidates also made references to disadvantages. Others gave responses such as 'easier to disconnect', 'just switch off if you don't want to talk' etc.

## **Question 7**

7(a) was attempted by the majority of candidates. A wide range and often generic responses, including references to accessibility, speed and detail were made, but these were not always directly related to production efficiency. Some candidates made references to CAM, others made statements referencing what happens rather than how or why it is a benefit.

7(b) was attempted by the majority of candidates, the better prepared often gaining 3 or 4 marks. However, responses did not always relate to packaging and dispatch, and references to production and retailing often without an explanation were made by some candidates. Other candidates made statements relating to what happens rather than identifying benefits. Some candidates simply focussed on packaging and dispatch and made a general statement relating to this manufacturing stage. Other candidates confused the packaging and dispatch stage with the design and marketing stage.

## **Section B**

### **Question 8**

8(a) the more able candidates were able to state sufficient functions to gain 3 marks. Lower and average ability candidates were often only able to state one or two of the more common functions such as 'sweetness', often without any

clarification, thus limiting the marks awarded. The functions were generally not well understood by lower ability candidates.

8(b) the functions were generally not well understood by low and some average ability candidates. Low level responses were often single words such as flavour, texture, without any explanation. More able well prepared candidates were able to state sufficient functions to gain 3 marks.

8(c) the functions were generally not well understood by most low and some average ability candidates. Low level responses were such as 'makes it bigger' without explanation were given. More able well prepared candidates were able to state sufficient functions to gain 3 marks.

### **Question 9**

9(a)(i) was correctly answered by the majority, however, some lower and average ability candidates incorrectly named the stages.

9(a)(ii) was correctly answered by many candidates who had researched the product. Some gave an incorrect answer, others gave no answer.

9(b)(i) this question produced a wide range of responses. Many lower and average ability candidates were unable describe in detail the marketing stage specific to jam doughnuts often giving minimal or generic responses without referencing them directly to the product. The well prepared, more able candidates frequently gained full marks.

9(b)(ii) this question produced a wide range of responses. Many lower and average ability candidates were unable describe the materials and supply stage applicable to jam doughnuts in sufficient detail to gain full marks and often relied on minimal generic responses without linking them to the product. Some candidates referred to dispatch. More able candidates, who had researched the product and retained the information, often gained full marks.

### **Question 10**

10(a) was very well answered by those candidates who had researched and studied the product. Lower ability candidates often stated inappropriate ingredients, such as yeast.

10(b)(i) this question produced a wide variety of appropriate responses relating to production processes. Many lower ability candidates gave inappropriate or generic responses, eg a single word without explanation, a reference to the production process eg resting etc. More able candidates, who had researched and studied manufacturing the product in detail and retained the information, frequently gained full marks.

10(b)(ii) candidates who had researched and studied manufacturing the product in detail frequently gained full marks. Lower ability candidates did not always use correct terminology, did not fully focus on the question or give appropriate explanations. Some candidates simply described what happens in the proving of dough i.e. 'makes it rise', without reference to automation. Only a few candidates actually referenced the benefits of it being an automated process.

10(c) knowledge of modern materials and how they contribute to improving products was generally not well understood by lower and average ability candidates. Some candidates also responded with references to non-modern materials. Some lower level responses often lacked explanations or were generalised ie relating to flavour, texture and shelf life. Well prepared and more able candidates gave well developed responses gaining full marks. Some candidates referenced machinery or the working environment.

### **Question 11**

11(a)(i) was attempted by most candidates producing a wide variety of responses. Some responses were not always appropriate ie incorrect descriptions or examples. Some responses were not relevant to packaging and dispatch, others lacked sufficient explanation. Some candidates stated what 'happens' in packaging and dispatch without making any reference to QC, others simply made general comments relating to QC. Lower ability candidates often gave simplistic answers eg checked. Well prepared and more able candidates gave well developed responses often gaining full marks.

11(a)(ii) lower ability and some average ability candidates were unable to provide appropriate examples of automation used in the production of jam doughnuts eg simplistic answers such as 'by itself' were used, while others gave low level /generic type responses which were not always related to the product. More able candidates who had researched and studied how jam doughnuts are mass produced and were able to retain the information often gained full marks.

11(b) was well answered by many candidates with more able candidates often giving more than one advantage to the manufacturer, responses often focused on consistency or sales. More able candidates gained 2 marks.

### **Question 12**

12(a)(i) was well answered by many candidates. Some lower level candidates gave responses relating to the impact on manufacturing; others gave generic responses with little or no explanation. More able candidates gave good responses with well developed explanations often focussing on fewer workers needed, unemployment, training, new/different skills, safety etc, many gaining full marks.

12(a)(ii) some candidates gave responses relating to the factory environment rather than how modern technology impacts on global environment, often giving low level responses. More able candidates gave good responses with well developed explanations, gaining full marks. More able candidates often gave a combination of both negative and positive responses.

12(b)(i) many candidates were able to state one or two uses of ICT relating to the marketing stage.

12(b)(ii) this question proved difficult for many candidates and was not well answered, references to packaging, dispatch, advertising, emails, texts etc were given.

12(b)(iii) more able candidates gave good responses with well developed explanations, often gaining full marks. Lower and some average ability

candidates often displayed little knowledge or understanding of how ICT could be of benefit to the retailer. References to production, quality control were made, though a number of candidates failed to identify a benefit but simply identified what could be done with ICT.

### **Question 13**

Most answers related directly to safety in manufacturing, and more able candidates were able to give comprehensive and wide ranging answers. There was some evidence of the question being misunderstood by some lower ability candidates who linked control technology to manufacturing, materials etc and not safety, or gave answers which were not relevant to the question. A number of candidates confused Control Technology with Quality Control. Others did not relate safety to Control Technology, focusing instead on wearing protective clothing. Responses relating to the workforce were usually comprehensive and often included references to less staff, new/different skills, safer.

### **Question 14**

This question produced a wide range of responses. More able candidates were able to grasp and discuss the issues well, often gaining 4 or more marks, and appropriate references to recycling heat and energy within the factory and generating energy through solar and wind power were made. Lower ability candidates who attempted the question often gained 1 or 2 marks but were unable to discuss in detail how manufacturers could reduce energy consumption. Some of the average ability candidates gave lengthy answers but often referred to the 'environment', and then pursued this strand into generalised green issues. Some also identified the use of recycled materials or recycling as a cure for pollution or a means of saving money/increasing profit without reference to the wider issue of energy consumption.

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