

Examiners' Report/  
Principal Examiner Feedback

Summer 2013

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

There was a wide range of responses seen in both Section 'A' and Section 'B'. Some students did not appear to fully appreciate that the maximum number of marks available per question or part question and the level of response required to gain those marks were linked, restricting the marks which could be awarded. Across the whole of the paper parts of some questions were not attempted by a number of students, again restricting the number or marks that could be awarded. A significant number of more able students attempted all or most questions and gained high marks.

A significant number of average and lower level students would have benefited from developing examination skills and practicing techniques associated with them. It appeared that some students did not read the questions carefully or in their entirety before starting to answer and as a consequence misunderstood or misinterpreted what was required of them eg gave a disadvantage when an advantage was requested, confusing CAM and CAD, not always relating their responses to the product or other parts of the question where this was a requirement, therefore reducing the marks which could be awarded. The more demanding questions at the end of each section proved difficult for many lower ability students, inappropriate, low level, or no responses were often given. Guidance as to what kind of response is expected from particular types of questions, especially those requiring an explanation, description or discussion or where correct terminology is essential to gain maximum marks would benefit the students. Frequently those questions requiring an 'explanation', 'description', or requiring 'discussion' were answered with low level responses which were not fully developed, again reducing the marks which could be awarded, this particularly affected lower ability students.

Average and less able students frequently gave generic responses that lacked an understanding of the sector. Basic responses such as 'cheaper', 'quicker', 'easier', 'simple' were given with little or no explanation, again limiting the marks which could be awarded.

In Section B there was evidence that a significant number of students had not fully researched strawberry jam and how it is manufactured in sufficient depth, or were not able to retain the information or express it adequately in their responses. Students who had researched and retained the information relating to strawberry jam and its manufacture and used correct terminology, gained marks. The brevity of answers sometimes disadvantaged students, as they often lacked explanation or clarity.

### Section A

#### Question 1

- (a) most students correctly identified both products belonging to the Food and Drink sector.
- (b) incorrect responses were made by some students eg microwave, bread maker.

## Question 2

(a) Table 1 - the majority of students correctly named the 'funnel', however a number did not eg 'sieve', 'filter'.

The majority of students were able to correctly name the 'timer', however, a number named it incorrectly eg 'stop clock', 'scales'.

(b) Table 2 - the uses of the 'hygrometer' were generally not well understood by the majority of students, responses relating to temperature but without reference to humidity were common, other responses included references to 'scales', 'timers' etc.

The uses of the dredger were generally understood, however some lower and average ability students gave answers that did not fully explain its uses sufficiently to gain maximum marks. Other low level responses referred to 'drainers', 'graters', 'strainers', 'grinders', etc. Those students able to fully develop 'the use' in their response were awarded full marks.

## Question 3

This question was attempted by the majority of students, many average and above average gaining 5-7 marks, below average gaining 2-4 marks. Incorrect links usually centred on 'Information and Communication Technology' (ICT) and 'Control Technology' links. A number of students also incorrectly linked 'modern materials'.

## Question 4

(a)(i) A significant number of students were able to correctly name two products. Products from previous question papers were sometimes named, however some students listed random responses including 'data bases', 'market research', 'internet', 'mobile phones', 'weighing machine', 'automated conveyors', 'temperature', 'weight', 'spreadsheets', 'stock control', 'robotics', 'quality control'.

(b)(i) Whilst many students precisely named a stage, a significant number did not.

(b)(ii) This was well answered by the average and more able students naming the stage correctly in (b)(i). Lower ability students often gave brief or generic responses, or no response in some instances.

(c)(i) A significant number of students were able to state an appropriate modern material used in 'Product 1'. Lower ability students sometimes gave responses that lacked understanding of what a modern material is, they simply named a product or gave an abstract response eg 'CAD', 'moving ovens', 'packaging', 'printing'.

(c)(ii) Generally well answered by those students who focussed on the modern material named in 4(c)(i), many gaining maximum marks for a well developed answer. Some lower ability students did not always make appropriate reference to 'changes in product characteristics', but made reference to the material or to the manufacture of the product eg 'added with the flour'. Brief or generic responses were often made. A small number of students did not attempt any part of the question.

## Question 5

(a)(i) The majority of students were able to state an appropriate use of CAM. However, some students confused CAM and CAD, and responded accordingly eg 'design', 'designs packaging', 'to modify existing products', or gave low level responses such as 'monitors control', 'packaging', 'production'. Some students made reference to marketing.

(a)(ii) More able students were able to explain appropriate benefits, these often related to quality, efficiency, waste, reduced labour, consistent product, etc. Less able students sometimes gave benefits that were not always appropriate.

(b)(i) Many students were able to state an appropriate alternative use of CAD, however, some gave examples which were CAM related or not fully explained eg 'assembly and finishing', 'the design will be better', 'design', 'shape of product'. Some low level responses included 'it calculates amounts'.

(b)(ii) More able students were able to fully explain a benefit, some lower level students confused CAD and CAM and gave inappropriate responses, generic or low level responses eg 'CAD does all the work'.

(c) This was answered well by more able students, many focussing on consistency, better quality, lower price. Some students centred their response on CAD not CAM or gave low level responses such as 'makes product stand out', 'use of computers to control the manufacture'.

## Question 6

(a) A variety of responses were given, but were not always supported by a suitable description. Well answered by the more able students, however, lower ability students were unable to describe the term 'spreadsheet' adequately or appropriately eg 'a spread sheet is a cam device'.

(b)(i) A significant number of students attempted this part of the question, many naming an appropriate traditional method. However, some students gave inappropriate or un-developed responses eg 'measuring ingredients by hand', 'a table', 'conferencing'.

(b)(ii) The majority of students attempted this part of the question. The more able gave well developed explanations relating to the advantages to the retailer. Some lower ability students responded with references to 'the manufacturer' or 'manufacturing', 'personnel data', 'changing column size', 'labelling', others gave responses relating to the retailers database.

(b)(iii) Many students attempted this part of the question and the more able gave detailed, well developed responses, often referring to potential loss of data, security, costs of repair, data input not accurate. Some lower level students made reference to disadvantages relating to the individual, not the manufacturer eg 'losing jobs'.

## Question 7

(a) This was attempted by the majority of students. A wide range of responses were given, including references to injury, getting hurt. Some low level inappropriate responses related to manufacturing eg 'removal of faulty products', 'temperature control', 'waste'. Often, responses were not fully explained to gain full marks.

(b) Although attempted by a significant number of students, a minority made no attempt to answer the question. A wide range of responses were given, including references to reduced waste, reduced labour. Some low level responses did not directly relate to production efficiency or were not explained eg 'saves its data', 'saves money for the buyers' 'shows how many you are going to sell'. Often responses were not fully explained to gain full marks.

## Section B

### Question 8

(a)(i) The more able students were able to state sufficient functions supported by a sketch to gain 3 marks. Lower and average ability students were often able only to state one or two of the more basic functions of the label such as 'what's inside the jar', 'gives information', limiting the marks that could be awarded. Some students did not provide any form of sketch.

(a)(ii) The more able students were able to state sufficient functions supported by a sketch to gain 3 marks. Lower and average students were often able only to state one or two of the more basic functions of the safety button.

(b) This was attempted by most students. The more able students provided detailed responses relating to the functions of the strawberries, most focussing on flavour, colour, and texture. Not always well understood by some lower ability students who gave inappropriate responses not relevant to the question eg 'to put in cakes', 'bought in jars', 'to clean, chop, crush'.

### Question 9

(a)(i) This was not well answered by a significant number of students. Some lower and average ability students incorrectly named one or both of the stages or did not attempt the question. More able students gave correct responses.

(a)(ii) Generally well answered by many students who had researched the product. Others gave an incorrect answer or did not attempt the question.

(b)(i) This question produced a wide range of responses. Many lower and average ability students were unable to describe in detail the design stage specific to strawberry jam, often giving minimal responses which were not always directly related to the product. Some students referred to manufacturing, quality control. More able students frequently gained full marks through well developed responses.

(b)(ii) This question produced a wide range of responses. Many lower and average ability students were unable to describe the marketing stage applicable to strawberry jam in sufficient detail to gain full marks, and often relied on minimal or

generic responses, without linking them to the product. Some students referred to production, design. More able students, who had researched the product and retained the information, often gained full marks.

### **Question 10**

(a) This question was very well answered by those students who had researched and studied the product. Lower ability students often stated inappropriate ingredients such as 'water', 'sugar', 'glucose'.

(b)(i) Generally answered well, producing a wide variety of appropriate responses relating to production processes including cleaning/crushing/chopping/pasteurizing the strawberries. Many lower ability students gave inappropriate or generic responses, eg marketing, designing, structure, function, hazards, stabilisers. Often a single word response without any explanation was given. More able students, who had researched manufacturing the product in detail and retained the information, frequently, gained full marks.

(b)(ii) More able students, who had researched and studied manufacturing the product in detail and retained the information, frequently gained full marks. Lower ability students often used generic explanations which did not directly relate to the product eg 'can affect the end product'. Correct terminology was not always used and students did not always fully focus on the question or give appropriate explanations eg 'reduce storage space'. Others gave descriptions of the process.

(b)(iii) Again, more able students, who had researched and studied manufacturing the product in detail and retained the information, frequently gained full marks, references including lower cooking temperature, safety, reduced risk of contamination, consistency, quicker process, costs, were made in well structured responses. The vacuum boiling process was not well understood by many lower and some average ability students. Some lower level responses often lacked explanation or were generalised.

### **Question 11**

(a)(i) This question was attempted by most students, producing a wide variety of responses, but not well answered by a significant number. Some responses were not always appropriate with incorrect explanations or references. Some responses were not relevant to process control, others lacked sufficient explanation eg CCTV, 'make sure you do it correctly', 'time efficient', 'purchase of materials'. Well prepared and more able students gave soundly developed explanations usually gaining full marks.

(a)(ii) Lower ability and some average ability students were unable to provide appropriate explanations or gave simplistic undeveloped responses such as 'easier', 'simple', 'quick', 'nothing goes wrong', 'ensure there are no problems', 'responds to retailer demands', 'materials supply'. While others gave low level or generic type responses which were not related to strawberry jam. More able students who had researched and studied in detail how strawberry jam is manufactured, often gained full marks.

(b) Some students made reference to jar or glass production, production processes. More able students gave appropriate examples of quality control, including visual inspection, temperature checks, colour checks, pH checks.

## Question 12

(a)(i) This question was attempted by many students. Frequent references to skill levels were stated. Lower level responses related to fewer staff, production processes, design, controls and costs. Some students gave responses relating to the impact on manufacturing, others gave generic responses with little or no explanation. More able students gave good responses with well developed explanations, many gaining full marks.

(a)(ii) Although attempted by most students, it was not generally well understood and a number of abstract responses reflected this. Appropriate responses referred to noise pollution and cleaner environment.

A number of students confused part (a)(i) with part (a)(ii) and vice versa.

(a)(iii) Many more able students were able to explain a wider environmental benefit reasonably well, although some responses were brief and not fully developed. Less able students gave responses that sometimes did not relate to the question or were not explained eg 'more product could be made'.

(b) This question was attempted by the majority of students, but generally was not well understood, and was not well answered. Not all responses related to the 'packaging and dispatch' stage with numerous references to the retailer scanning for price, some references to production operations were also made. More able students often gave well developed responses. Less able students often gave brief unexpanded responses eg 'quicker', 'easier' or responses not related to the question.

## Question 13

More able students were able to fully explain the impact of modern materials on customer satisfaction, often making references to flavour/taste, shelf life, texture, size, volume. There was some evidence of the question being misunderstood by some lower ability students, who made references to production processes, workplace safety, efficiency, and production times. Others gave generic unexplained responses such as 'improved overall', 'better or enhanced quality'.

## Question 14

This question produced a wide range and variety of responses. More able students were able to grasp and discuss the effects well, often gaining 4 or more marks, appropriate references to lower costs, aesthetics were given. Lower ability students who attempted the question often gained 1 or 2 marks but were unable to discuss in detail the effects on marketing and selling when using modern technology to improve production processes and profitability.



## **Grade Boundaries**

Grade boundaries for this, and all other papers, can be found on the website on this link:

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