

Examiners' Report/
Principal Examiner Feedback

Summer 2014

Pearson Edexcel GCSE in
Application of Technology in
Engineering and Manufacturing

Unit 5EM03 Paper 3B
Food and Drink, Biological and
Chemical

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5EM03/3B

Food and Drink, Biological and Chemical

General Comments

As with previous papers there was a wide range of responses in both section 'A' and section 'B'.

Not all students fully appreciated that the maximum number of marks available and the level of response required to gain those marks were linked, this often limited the number of marks which could be awarded. Some questions were not attempted by a number of students therefore no marks could be awarded. The majority of more able students attempted most of the questions and gained high marks.

It appeared that some students did not carefully read the whole of the question before starting to answer which resulted in some inappropriate responses. Some answers did not relate to the product or other parts of the question where this was a requirement, therefore restricting the marks that could be awarded. The more demanding questions at the end of each section proved difficult for many lower ability students.

A significant number of students would have benefitted from developing examination skills and practicing techniques associated with them, especially 'describe', 'explain' and 'discuss' type questions or where correct terminology is essential to gaining maximum marks. Many responses were brief and not always fully developed, again restricting the marks which could be awarded.

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

In 'Section 'B' there was evidence that a significant number of students had not fully researched the manufacture of mass produced milk chocolate bars or were not able to retain the information or communicate it appropriately in their responses, and again, this limited the number of marks which could be awarded. Those students who had comprehensively researched and retained the information relating to the manufacture of mass produced milk chocolate bars and used correct terminology, gained marks. Very brief responses sometimes disadvantaged students, as they often lacked explanation or clarity.

In addition developing skills relating to discussion topics (ref.Q14) would assist many students.

Section A

Question 1

Q1(a); most students correctly identified products belonging to the Food and Drinks sector.

Q1(b); most students correctly identified products belonging to the Biological and Chemical sector.

Question 2

Q2(a); the more able students correctly named both symbols. Some students named the symbols inadequately or incorrectly e.g. 'bin', 'recycling', 'recycling man', 'waste control' or gave inappropriate responses.

2(b); the more able students correctly described the meaning of both symbols. Students sometimes gave inappropriate responses e.g. 'not used chemicals', 'economic fee', 'the product comes from a safe place', 'produced the cheapest way possible' and 'organic material'.

Question 3

This question was attempted by the majority of students, with many students gaining 6-7 marks and less able students gaining 3-4 marks. Incorrect links often centred on modern materials e.g. 'enteric coating'.

Question 4

Q4(a); a significant number of students were able to correctly name two products from the sector. Products from previous question papers were often used.

Q4(b)(i); many more able students correctly named a type of control technology, however a significant number of lower ability students did not, and typical low level responses included, 'packaging and dispatch', 'design', 'mixing and refining', 'electric mixer' and 'visual checks'.

Q4(b)(ii); well answered by both average and more able students who were able to explain the reasons for using the control technology stated in Q4(b)(i). Some students often gave, brief, generic or inappropriate responses.

Q4(c)(i); a significant number of average and more able students were able to state an appropriate heating process relating to 'product 1' in Q4(a). Some students sometimes gave responses that lacked an understanding of heating processes used in the sector.

Q4(c)(ii); this was fairly well answered by those more able students who focused on describing the heating process named in Q4(c)(i). Some less able students were not able to describe the heating process adequately. Descriptions of what occurred during the heating process, rather than describing the heating process were common.

Question 5

Q5(a); the majority of students were able to describe an appropriate use of websites, often gaining 2 marks. Responses were varied but were frequently linked to 'advertising' and 'finding suppliers'.

Q5(b); many students were able to describe appropriate benefits, these often related to 'output', 'quality', 'labour costs', 'efficiency', 'quality' and 'consistency'. Some low level responses made references to 'CAD' or were not fully explained e.g. 'less problems', 'the manufacture of the product'.

Question 6

Q6(a)(i); a significant number of average and more able students correctly named two examples of electronic communications technology. Some students re-stated (from the stem), 'email' or 'communications technology' or gave some inappropriate response e.g. 'electronic scales'.

Q6(a)(ii); most students attempted this part of the question and the more able gave detailed descriptions. Some students made responses not related to the question e.g. 'advertising' or were too generic e.g. 'quick', 'easy' and 'time saver'.

Q6(b)(i); most students attempted this part of the question, many correctly naming an appropriate material. However, some less able students gave an inappropriate response e.g. 'glazing', 'mint', 'jelly beans' and 'packaging'.

Q6(b)(ii); the majority of students attempted this part of the question. The more able gave well developed explanations as to why finishes are applied to modern food products. Some students responded with undeveloped statements such as 'to give finishing touch' or made references to the functions of a modern material.

Question 7

Q7(a); this part of the question was attempted by the majority of students. A wide range of responses were given, including references to 'advertising', 'monitoring sales' and 'increasing sales'. Some responses were not sufficiently explained to gain full marks e.g. 'to sell the product', 'quicker' and 'more efficiently'. Some lower level responses related to manufacturing the product.

Q7(b); most students attempted this part of the question many gaining 2-3 marks. Some low level responses did not directly relate to production or related to another stage e.g. 'design'. A number of lower level responses did not refer to a benefit or simply made a generic statement e.g. 'barcodes are used to identify a product'.

Section B

Question 8

Q8(a); many students were able to state more than enough functions supported by a sketch to gain 3 marks. Some less able students were often only able to state two of the more basic or generic functions of the wrapping. Some students did not provide a sketch.

Q8(b); this was attempted by most students. The more able students provided detailed responses relating to the functions of the emulsifier, most focusing on 'shelf life', 'moulding' and 'bloom'. Not well understood by some students who gave inappropriate responses e.g. 'not too sticky', 'kills bacteria', 'makes the food fresh', 'keeps the product cool' and 'assembly' or made generic responses not linked to the product.

Q8(c); some students did not attempt this part of the question. More able students provided well developed responses related to the cocoa mass. Less able students gave inappropriate responses, such as those relating to manufacturing stages or un-developed responses e.g. 'helps with the temperature', 'they roast cocoa powder', 'makes mix more condense', 'how much cocoa is in the chocolate' and 'beans are roasted'.

Question 9

Q9(a)(i)(1); answered correctly by most students.

Q9(a)(i)(2); answered correctly by most students.

Q9(a)(ii); answered correctly by many students. Some incorrect responses included 'packaging and dispatch' and 'production and processing'.

Q9(b); this question produced a wide range of responses. Many lower and average ability students were unable to accurately list appropriate activities carried out at the materials supply and control stage, often giving minimal or inappropriate responses such as 'total management of resources'. Some students referred to the product or production stages. More able students gained full marks by providing a correct list.

Q9(c); this question produced a wide range of responses. Many lower and average ability students were unable to describe the production planning stage, applicable to milk chocolate bars, in sufficient detail to gain maximum marks and often gave minimal, generic or inappropriate responses. Some made references to production stages. More able students gained full marks through well developed responses.

Question 10

Q10(a); this was answered correctly by most students who had researched and studied the product. Less able students stated inappropriate ingredients e.g. 'vanilla ', 'cocoa masses, 'flavouring' or 'humectant'.

Q10(b)(i); this was well answered by the more able students who were able to correctly state appropriate production processes. A significant number of students gave inappropriate or generic responses, e.g. 'marketing', 'designing', 'packaging and dispatch', 'continuous batch production' and 'production planning'.

Q10(b)(ii); more able students, who had researched the manufacture of milk chocolate bars and retained the information, frequently gained full marks. Less able students often used generic explanations which did not directly relate to the 'product' or 'tempering', some responses were not sufficiently developed e.g. 'quick', 'efficient'.

Q10(c); well answered by the more able students, often gaining full marks. Less able students sometimes gave generic responses or inappropriate responses i.e. references to 'robotics', 'less jobs', 'ICT' and 'cakes'. Some students did not attempt this part of the question.

Question 11

Q11(a)(i); this was attempted by most students producing a wide variety of responses. Some responses were not always appropriate i.e. references to 'machinery' and 'testing new materials', or they lacked explanation e.g. 'improves speed', 'efficiency' or low level responses such as 'CAM'.

Q11(a)(ii); some students were unable to provide appropriate explanations or gave simplistic undeveloped responses such as 'greater accuracy', 'less time', 'money saving', 'increased speed'. Others gave low level or generic type responses which were not related to this part of the question e.g. CAD.

Q11(b); generally not well answered, numerous students made reference to 'design' or to 'manufacturing the chocolate'. Others failed to provide appropriate responses linked to the retailer or gave generic responses e.g. 'easier', 'fast' and 'efficient' without explanation. A few students did not attempt this part of the question.

Q11(c); this part of the question produced a wide range of responses. Numerous students focused on only one aspect of the question e.g. 'design'. References linked to 'the impact' were not always fully developed or explained. The use of generic terms formed the basis of many responses. More able students were typically awarded 3 marks.

Question 12

Q12(a); this was attempted by the majority of students. Most students focused on 'a smaller workforce' and 'training'. Frequent references to 'skill levels' were also made. Some lower level responses were not related to the question e.g. 'systems control'. More able students provided responses with well developed explanations many gaining 3 or 4 marks.

Q12(b); although attempted by most students it was not generally well understood by some. Appropriate responses from more able students often referred to a cleaner' and 'safer' environment. A number of inappropriate

responses not related to the working environment were also made e.g. 'cheaper to run, 'it will save time and money'.

Q12(c); many more able students were able to state a wide range of appropriate 'other issues'. However some low level responses included a 'workforce' and 'working environment' theme. Low level responses were often brief or not fully developed.

Question 13

This question was attempted by most students. More able students were able to explain how waste heat can be used appropriately e.g. 'heating work place', 'heating water', in the manufacturing process 'usually gaining 2 or 3 marks. Lower level responses focussed on 'why' waste heat is used rather than 'how' it is used. A few students did not attempt this question.

Question 14

This question produced a wide range and variety of responses. More able students were able to discuss the benefits of 'just-in-time techniques' well, often gaining 4 or more marks, appropriate references to 'reduced storage space', 'costs' and 'waste' were often made. Less able students who attempted the question often gained only 1 or 2 marks as they were unable to discuss in detail the benefits or did not understand 'just-in-time techniques'.

The quality of spelling, punctuation, grammar and clarity of expression was varied.

Grade Boundaries

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