

# Mark Scheme (Pre-Standardisation) Summer 2016

Pearson Edexcel GCSE  
in Manufacturing & Engineering (5EM03/3B)  
Food and Drink (Paper 3B)

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## General Marking Guidance

- All learners must receive the same treatment. Examiners must mark the first learner in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Learners must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
- There is no ceiling on achievement. All marks on the mark scheme should be used appropriately.
- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the learner's response is not worthy of credit according to the mark scheme.
- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- When examiners are in doubt regarding the application of the mark scheme to a learner's response, the team leader must be consulted.
- Crossed out work should be marked UNLESS the learner has replaced it with an alternative response.
- Mark schemes will indicate within the table where, and which strands of QWC, are being assessed. The strands are as follows:

*i) Ensure that text is legible and that spelling, punctuation and grammar are accurate so that meaning is clear*

*ii) Select and use a form and style of writing appropriate to purpose and to complex subject matter*

*iii) Organise information clearly and coherently, using specialist vocabulary when appropriate.*

Question	Answer	Mark
<b>1(a)</b>	<ul style="list-style-type: none"> <li>• Mustard</li> <li>• Bottled water</li> </ul> <p>If 3 boxes or more crossed - no marks.</p> <p style="text-align: right;">(2 x 1)</p>	<b>(2)</b>
<b>1(b)</b>	<ul style="list-style-type: none"> <li>• Sun cream</li> <li>• Dishwasher powder</li> </ul> <p>If 3 boxes or more crossed - no marks.</p> <p style="text-align: right;">(2 x 1)</p>	<b>(2)</b>
<b>(Total 4 marks)</b>		

Question	Answer	Mark
<b>2(a)(1)</b>	<ul style="list-style-type: none"> <li>• Palette knife</li> <li>• Spreading knife</li> <li>• Spreader</li> </ul> <p>Do not accept knife on its own</p> <p>Accept any recognisable spelling (phonetic) of the answer above</p> <p style="text-align: right;">(1 x 1)</p>	
<b>2(a)(2)</b>	<ul style="list-style-type: none"> <li>• Chopper</li> <li>• Stainless steel chopper</li> <li>• Steel chopper</li> <li>• Herb chopper</li> <li>• Vegetable chopper</li> </ul> <p>Do not accept cutter.</p> <p>Accept any recognisable spelling (phonetic) of the answer above</p> <p style="text-align: right;">(1 x 1)</p>	<b>(2)</b>
<b>2(b)(1)</b>	<p>An answer that makes reference to two of the following points:</p> <ul style="list-style-type: none"> <li>• Used to hand deposit/squeeze out/pipe bulk mixtures/creams/cake batters/mashed potato etc. (1)</li> <li>• Used to ensure consistent sizes/quantities are deposited (1)</li> <li>• Used to form various shapes (1)</li> <li>• Used to decorate products/make products more attractive (1)</li> <li>• Used to speed up production (1)</li> </ul> <p>Accept any other appropriate response</p> <p>e.g. used to deposit cake batter into bun cases (1) to speed up production (1)</p> <p>(1 x 2)</p>	
<b>2(b)(2)</b>	<p>An answer that makes reference to two of the following points:</p> <ul style="list-style-type: none"> <li>• Used to make different shapes of chocolates/cakes/potato etc. (1)</li> <li>• Used to make chocolates/cakes/potato etc. all the same size (1)</li> <li>• Helps ensure consistent products are made (1)</li> <li>• Used to hold different fillings/mixtures (1)</li> <li>• Used to make chocolate 'glossy' (1)</li> <li>• Used to speed up production/helps save time (1)</li> <li>• Used to make/process large batches (1)</li> </ul> <p>Accept any other appropriate response</p> <p>e.g. used to produce large amounts of chocolates (1) which are all the same shape (1)</p> <p>(1 x 2)</p>	5EM03_3B 1606 <b>(4)</b>

Question	Answer	Mark
<p><b>3</b></p>	<p>Key terms linked to a key area</p> <p>No mark awarded where 2 or more lines are drawn from a term. Lines do not have to be straight but term and key area must be clearly linked.</p> <p>(7 x 1)</p>	<p>(7)</p>
<p><b>(Total 7 marks)</b></p>		

Question	Answer	Mark
<b>4(a)</b>	<p>Appropriate two <b>products</b> such as e.g.</p> <ul style="list-style-type: none"> <li>• Bread</li> <li>• Cake</li> <li>• Pies</li> <li>• Toffee</li> <li>• Soup</li> <li>• Jam</li> <li>• Doughnuts</li> <li>• Milk chocolate</li> <li>• Sultana scones</li> <li>• A brand name of any other specific product is acceptable</li> </ul> <p>This list is not exhaustive, accept any product from the food and drink, biological and chemical sectors and that uses control technology in its manufacture</p> <p>(2 x 1)</p>	<b>(2)</b>
<b>4(b)(i)</b>	<p>Appropriate mixing process suitable for the named product:</p> <ul style="list-style-type: none"> <li>• Batch</li> <li>• Continuous</li> <li>• High speed</li> <li>• Pressure</li> <li>• Vacuum</li> <li>• Chorleywood</li> <li>• Spiral</li> <li>• Creaming / Sugar batter</li> <li>• Whisking</li> <li>• All-in</li> <li>• Rubbed in</li> <li>• Multi-stage</li> <li>• Sponge</li> </ul> <p>Accept answers naming specific types of appropriate processes</p> <p>Accept any appropriate response</p> <p>Do not accept mixing machine without clarification</p> <p>(1 x1)</p>	<b>(1)</b>

Question	Answer	Mark
<p><b>4(b)(ii)</b></p>	<p>An answer that makes reference to three of the following procedures:</p> <ul style="list-style-type: none"> <li>• The correct mixer type is selected (1)</li> <li>• The specified mixing tool attached (1)</li> <li>• The ingredients are checked (1)</li> <li>• The ingredient temperatures are measured (1)</li> <li>• The correct quantities of ingredients are placed in the mixer (1)</li> <li>• The ingredients are added to the mixer in the specified sequence (1)</li> <li>• The timer is set (1)</li> <li>• Specified mixing speeds are selected (1)</li> <li>• The correct vacuum is set(1)</li> <li>• The correct pressure is set (1)</li> <li>• Specified procedures are followed (1)</li> <li>• Mixture consistency is checked (1)</li> <li>• Specific volume is measured (1)</li> <li>• The temperature is measured (1)</li> <li>• Mixing data is recorded (1)</li> <li>• The mixer is emptied (1)</li> <li>• Mixtures are sent to the next location (1)</li> <li>• Safe handling procedures are followed(1)</li> </ul> <p>Accept any appropriate response.</p> <p>Answers must relate to the named product.</p> <p>No marks for repeating the mixing process used without description.</p> <p>Low response (1) or two low responses (2) or 3 low responses (3) or detailed response (3)</p> <p>(1 x 3)</p>	<p style="text-align: right;"><b>(3)</b></p>

Question	Answer	Mark
<p><b>4(c)</b></p>	<p>One mark for each identification of example, one mark for each extension:</p> <ul style="list-style-type: none"> <li>• Weight control is applied continuously (1) and is adjusted automatically (1)</li> <li>• Conveyor systems (1) transfer materials to manufacturing location (1)</li> <li>• Pipe transfer systems (1) move powders to designated places (1)</li> <li>• Temperature control is automated (1) using thermostats (1)</li> <li>• Humidity is programmed (1) and production speeds controlled (1)</li> <li>• Pick and place robots (1) assemble products continuously (1)</li> <li>• Labelling is applied continuously (1) at the pack filling stage (1)</li> <li>• Product coding is applied (1) when packs are sealed automatically (1)</li> <li>• Remotely operated vehicles (1) move products to specified locations (1)</li> <li>• Linked PLCs (1) used to control manufacturing processes (1)</li> </ul> <p>Accept any appropriate response.</p> <p>Accept responses related to packaging the product.</p> <p>Answers must relate to the named product.</p> <p>Low response (1) or two low responses (2) or detailed response (2), for each of the 2 examples</p> <p>(2x2)</p>	<p style="text-align: right;"><b>(4)</b></p>
<b>(Total 10 marks)</b>		

Question	Answer	Mark
<p><b>5(a)</b></p>	<p>Accept reference to any of the following two functions:</p> <ul style="list-style-type: none"> <li>• To create a design (1)</li> <li>• To modify a design (1)</li> <li>• To analyse a design (1)</li> <li>• To optimise a design (1)</li> <li>• To improve the quality of a design(1)</li> <li>• To improve the accuracy of a design (1)</li> <li>• To reduce the cost producing a design (1)</li> <li>• To render (1)</li> <li>• To convert 2D to 3D (1)</li> <li>• To produce nets (1)</li> <li>• To stress test (1)</li> </ul> <p>Accept any appropriate response.</p> <p>Do not accept quicker, faster, easier, cheaper, better without appropriate reference to CAD.</p> <p>Low response (1) or two low responses (2)</p> <p>(2x1)</p>	<p style="text-align: right;"><b>(2)</b></p>
<p><b>5(b)</b></p>	<p>An answer that makes reference to two of the following disadvantages:</p> <ul style="list-style-type: none"> <li>• Set-up costs would be high (1) as hardware/software is required (1)</li> <li>• Cost of training staff will increase (1) due to new skills required (1)</li> <li>• Extra maintenance costs (1) due to specialist technicians required (1)</li> <li>• Ongoing updating costs (1) due to new technological developments (1)</li> <li>• Security issues (1) due to possible loss of data/theft of data (1)</li> <li>• Data can be corrupted (1) due to software malfunction (1)</li> </ul> <p>Accept any appropriate response.</p> <p>Low response (1) or two low responses (2) or detailed response (2)</p> <p>(1x2)</p>	<p style="text-align: right;"><b>(2)</b></p>

Question	Answer	Mark
<p><b>5(c)</b></p>	<p>An answer that makes reference to two of the following functions:</p> <ul style="list-style-type: none"> <li>• To control the whole manufacturing process (1)</li> <li>• To allow individual parts of the process to access database information (1)</li> <li>• To initiate necessary remedial actions (1)</li> <li>• To reduce manufacturing errors (1)</li> <li>• To control manufacturing (1)</li> <li>• To allow inter-departmental communication (1)</li> <li>• To maintain quality levels (1)</li> <li>• To schedule maintenance (1)</li> <li>• To store and retrieve data and information (1)</li> </ul> <p>Accept any appropriate response.</p> <p>Do not accept quicker, faster, easier, cheaper, better without appropriate reference to CIM.</p> <p>(2X1)</p>	

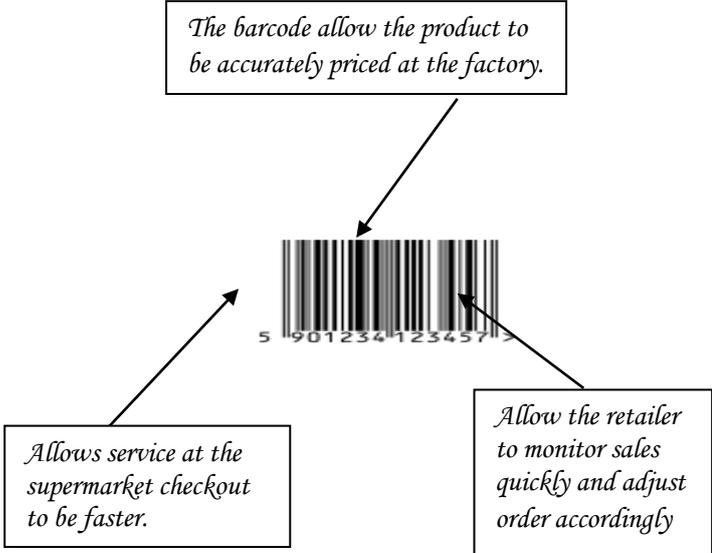
Question	Answer	Mark
<b>5(d)</b>	<p>One mark for identification of benefit, one mark for explanation:</p> <ul style="list-style-type: none"> <li>• Improved efficiency (1) by combining design and manufacturing stages (1)</li> <li>• Lower operational costs (1) shorter periods between product design and manufacture (1)</li> <li>• Can reduce waste (1) through better communications between design and manufacturing teams (1)</li> <li>• More consistent products (1) reduced risk of 'out of specification' product being made (1)</li> <li>• Increased sales (1) through quick response to customer demands for new products (1)</li> </ul> <p>Accept any appropriate response.</p> <p>Low response (1) or two low responses (2) or detailed response (2)</p> <p>(1x2)</p>	<b>(2)</b>
<b>(Total 8 marks)</b>		

Question	Answer	Mark
<b>6(a)(i)</b>	<p>Description that makes reference to three of the following points:</p> <ul style="list-style-type: none"> <li>• A collection of information/data</li> <li>• Information and data which is organised</li> <li>• Information and data presented in tabular formats</li> <li>• Handle information/data</li> <li>• Storage of information/data</li> <li>• Retrieve information/data</li> <li>• Interrogate data</li> <li>• Query data</li> </ul> <p>Accept any appropriate response.</p> <p>e.g. a database is a stored collection (1) of information which is organised (1) and easily retrieved (1)</p> <p>Low response (1), two low responses (2), three low responses (3) or detailed response (3)</p> <p>(1x3)</p>	<b>(3)</b>
<b>6(a)(ii)</b>	<p>One mark for identification of disadvantage, one mark for extension:</p> <ul style="list-style-type: none"> <li>• Costly to install hardware and software (1) due to data collection/inputting (1)</li> <li>• Systems can breakdown/fail (1) leading to loss of data (1)</li> <li>• Connectivity can be lost (1) causing delays (1)</li> <li>• Trained staff required (1) which can be expensive/difficult to recruit (1)</li> <li>• Wrong data can be entered (1) therefore, errors can be transferred/continued (1)</li> <li>• Data can be hacked (1) leading to viruses being introduced (1)</li> <li>• IT skills replace research skills (1) therefore, some knowledge base lost (1)</li> </ul> <p>Accept any appropriate response.</p> <p>Low response (1) or two low responses (2) or detailed response (2).</p> <p>(1x2)</p>	<b>(2)</b>

Question	Answer	Mark
<b>6(b)</b>	<p>One mark for identifying each reason, one mark for each extension:</p> <ul style="list-style-type: none"> <li>• Formulas used to generate results (1) meaning less risk of calculation errors (1)</li> <li>• Easier/efficient way of recording data (1) easier to edit (1)</li> <li>• Quicker presentation of information (1) which can be imported into charts/tables (1)</li> <li>• Can store a large amount of data (1) that can be used in decision-making (1)</li> <li>• Ability to share information (1) as data can be transferred electronically (1)</li> <li>• Can support management reports (1) as data can be modelled into 'what if' scenarios (1)</li> </ul> <p>Accept any appropriate response.</p> <p>No repetition.</p> <p>Low response (1) or two low responses (2) or detailed response (2), for each of the 2 advantages</p> <p>(2x2)</p>	<b>(4)</b>
<b>(Total 9 marks)</b>		

Question	Answer	Mark
<b>7(a)</b>	<p>One mark for identifying benefit, up to two marks for extension:</p> <ul style="list-style-type: none"> <li>• Reduced use of paper (1) fewer trees would be needed (1) reducing global warming (1)</li> <li>• Reduced use of fossil fuels (1) to process paper materials (1) and carry out printing processes (1)</li> <li>• Lower carbon emissions (1) less fuel/energy needed manufacture printed materials (1) and transport them (1)</li> <li>• Reduced waste (1) less discarded paper (1) reducing need for recycling (1)</li> <li>• Less processing of raw materials (1) would reduce pollution (1) and improve health (1)</li> <li>• Reduces need to travel (1) to meet customers/clients (1) means less emissions from transport (1)</li> </ul> <p>Accept any appropriate response.</p> <p>Up to 3 marks for a detailed response.</p> <p>(1x3)</p>	<b>(3)</b>
<b>7(b)</b>	<p>One mark for identifying advantage, up to two marks for extension:</p> <ul style="list-style-type: none"> <li>• Instant contact with potential customers (1) at low cost (1) to quickly obtain feedback (1)</li> <li>• Able to contact existing customers database (1) and target a wider audience (1) more efficiently (1)</li> <li>• Ability to change/modify marketing strategies quickly (1) to maximise potential sales (1) and achieve targets (1)</li> <li>• Can choose an appropriate communication system (1) to target potential customer sectors/groups (1) more quickly (1)</li> <li>• Allows for paperless marketing(1) reducing printing costs (1) and be updated easily (1)</li> <li>• Reduces time (1) to mail materials (1) which also reduces labour costs (1)</li> <li>• Reduces cash outlay producing printed materials (1) reduces storage space requirement (1) and potential waste of out of date materials (1)</li> </ul>	

Question	Answer	Mark
	<p>Accept any appropriate response.</p> <p>Do not accept references to specific types of communications technology e.g. email, internet, smart phone etc. without explanation of benefit.</p> <p>Up to 3 marks for a detailed response.</p> <p style="text-align: right;">(1x3)</p>	<b>(3)</b>
<b>(Total 6 marks)</b>		
<b>Total Marks for Section A</b>		<b>50</b>

Question	Answer	Mark
<p><b>8(a)</b></p>	<p>An answer that makes reference to any of the following points:</p> <ul style="list-style-type: none"> <li>• To aid faster re-ordering (1)</li> <li>• To assist with stock control (1)</li> <li>• To aid monitoring product movements (1)</li> <li>• To assist production planning (1)</li> <li>• To aid traceability (1)</li> <li>• To aid the monitoring of sales (1)</li> <li>• To assist with accurate pricing (1)</li> <li>• To aid data Collection (1)</li> <li>• To assist merchandising decisions (1)</li> <li>• To improve service at point of sale (1)</li> <li>• To aid unique product identification (1)</li> </ul> <div style="text-align: center;">  </div> <p>Accept any other appropriate response.</p> <p>Answer must contain both notes and sketches.</p> <p>Max <b>two</b> marks if only notes or sketches used.</p> <p style="text-align: right;">(3 x1)</p>	<p><b>(3)</b></p>
<p><b>8(b)</b></p>	<p>An answer that makes reference to any of the following points:</p> <ul style="list-style-type: none"> <li>• Adds flavour to the biscuit (1)</li> <li>• Contributes to sweetness (1)</li> <li>• Enhances the colour of the biscuit (1)</li> <li>• Source of carbohydrate (1)</li> <li>• Contributes to the texture (1)</li> <li>• Contributes to nutrition (1)</li> </ul> <p>Accept any other appropriate response. (3x1)</p>	<p><b>(3)</b></p>

Question	Answer	Mark
<b>8(c)</b>	<p>An answer that makes reference to any of the following points:</p> <ul style="list-style-type: none"> <li>• Contributes to shortness/texture (1)</li> <li>• Helps bind ingredients together (1)</li> <li>• Helps prevent gluten forming (1)</li> <li>• Make biscuit mix less tough/more soft (1)</li> <li>• Helps make the mix easier to process (1)</li> <li>• Make the biscuit mix easier shape (1)</li> <li>• Contributes to taste (1)</li> <li>• Increases shelf life (1)</li> <li>• Enriches the product (1)</li> </ul> <p>Accept any other appropriate response.</p> <p style="text-align: right;">(3x1)</p>	<b>(3)</b>
<b>(Total 9 marks)</b>		

Question	Answer	Mark
<b>9(a)(i)1</b>	Design (1 x 1)	
<b>9(a)(i)2</b>	Assembly and finishing Assembly Finishing Finishing and assembly (1 x 1)	<b>(2)</b>
<b>9(a)(ii)</b>	Marketing Stage two/stage 2 Two/2 Second/second stage/2 <sup>nd</sup> /2 <sup>nd</sup> stage (1 x 1)	<b>(1)</b>
<b>9(b)</b>	An answer that makes reference to any three of the following activities: <ul style="list-style-type: none"> <li>• Converting orders to production (1)</li> <li>• Calculating material requirements (1)</li> <li>• Estimating equipment requirements (1)</li> <li>• Establishing labour requirements (1)</li> <li>• Calculating packaging requirements (1)</li> <li>• Calculating energy requirements (1)</li> <li>• Scheduling production (1)</li> <li>• Calculating throughputs/outputs (1)</li> <li>• Establishing deadlines (1)</li> <li>• Scheduling quality checks (1)</li> <li>• Scheduling health and safety (1)</li> </ul> Accept any other appropriate response. (3 x 1)	<b>(3)</b>
<b>9(c)</b>	Appropriate descriptions including three of the following points (statements must be applicable to packs of rich tea biscuits): <ul style="list-style-type: none"> <li>• Ordering materials (1)</li> <li>• Receiving materials (1)</li> <li>• Goods inward inspection/testing (1)</li> <li>• Storing materials (1)</li> <li>• Stock checks/rotation (1)</li> <li>• Coding checks (1)</li> <li>• Quality checks (1)</li> <li>• Sourcing materials (1)</li> <li>• Purchasing materials(1)</li> <li>• Liaison with user departments (1)</li> <li>• Assembling 'internal' orders (1)</li> <li>• Delivery of 'internal' orders (1)</li> <li>• Completing documentation (1)</li> </ul>	

Question	Answer	Mark
	<ul style="list-style-type: none"> <li>• Liaison with administration departments (1)</li> </ul> <p>Accept any other appropriate response but must be related to the manufacture of packs of rich tea biscuits</p> <p>Accept references to packaging/ingredients/components.</p> <p>e.g. at the materials supply and control stage stock levels of flour, sugar and vegetable oil to make the rich tea biscuits would be checked (1) and coding inspections of all the ingredients would be carried out (1) before collating the internal ingredient orders for delivery to the production departments (1)</p> <p>3x1 marks for 3 low responses or up to 3 marks for a detailed response.</p> <p style="text-align: right;">(1 x 3)</p>	<b>(3)</b>
<b>(Total 9 marks)</b>		

Question	Answer	Mark
<b>10(a)</b>	<ul style="list-style-type: none"> <li>• Sodium bicarbonate (1)</li> <li>• Ammonium bicarbonate (1)</li> <li>• Sodium carbonates (1)</li> <li>• Ammonium carbonates (1)</li> <li>• E500 (1)</li> <li>• E503 (1)</li> </ul> <p>Accept any other appropriate response.</p> <p>Accept any recognisable spelling (phonetic) of the answers above.</p> <p style="text-align: right;">(1 x 1)</p>	<b>(1)</b>
<b>10(b)(i)</b>	<p>Any three of the following:</p> <ul style="list-style-type: none"> <li>• Sieving (1)</li> <li>• Blending (1)</li> <li>• Weighing/measuring ingredients (1)</li> <li>• Sheeting/rolling (1)</li> <li>• Cutting (1)</li> <li>• Moulding (1)</li> <li>• Embossing (1)</li> <li>• Conveyor transfer (1)</li> <li>• Rework (1)</li> <li>• Moisture control/Strayfield (1)</li> <li>• Cooling (1)</li> </ul> <p>Do not accept mixing or baking.</p> <p>Accept any other appropriate response.</p> <p>Accept any recognisable spelling (phonetic) of the answers above.</p> <p style="text-align: right;">(3 x 1)</p>	<b>(3)</b>

Question	Answer	Mark
<p><b>10(b)(ii)</b></p>	<p>An explanation that makes reference to three of the following points:</p> <ul style="list-style-type: none"> <li>• Efficient production method (1)</li> <li>• High production throughput (1)</li> <li>• Can be mass produced easily (1)</li> <li>• Easier to operate (1)</li> <li>• Cost effective (1)</li> <li>• Lower labour costs (1)</li> <li>• Better process control (1)</li> <li>• Easier to monitor (1)</li> <li>• Efficient use of energy (1)</li> <li>• Biscuits have consistent quality (1)</li> <li>• Minimal waste (1)</li> <li>• Better control of moisture content (1)</li> <li>• Improved shape retention (1)</li> </ul> <p>Accept any other appropriate response.</p> <p>e.g. automated baking is cost effective (1) producing consistent quality biscuits (1) with minimal waste (1)</p> <p>3x1 marks for 3 low responses or up to 3 marks for a detailed response</p> <p style="text-align: right;">(3 x 1)</p>	<p style="text-align: right;"><b>(3)</b></p>
<p><b>10(c)</b></p>	<p>An explanation that makes reference to three of the following points:</p> <ul style="list-style-type: none"> <li>• Improved product shelf life (1)</li> <li>• Longer raw materials storage times (1)</li> <li>• Fewer distribution constraints (1)</li> <li>• Improved product consistency (1)</li> <li>• Fewer reject products(1)</li> <li>• Less rework (1)</li> <li>• Less energy required (1)</li> <li>• Reduce product fragility (1)</li> <li>• More temperature tolerant (1)</li> </ul> <p>Accept any other appropriate response</p> <p>e.g. modern materials, such as preservatives, increase shelf life (1), they can also improve product consistency (1) resulting in fewer rejects (1).</p> <p>3x1 marks for 3 low responses or up to 3 marks for a detailed response</p> <p style="text-align: right;">(1 x 3)</p>	<p style="text-align: right;"><b>(3)</b></p>

Question	Answer	Mark
<b>(Total 10 marks)</b>		

Question	Answer	Mark
<b>11(a)</b>	<p>Any two of the following reasons:</p> <ul style="list-style-type: none"> <li>• To improve efficiency (1)</li> <li>• To improve throughput/output (1)</li> <li>• To reduce manufacturing costs (1)</li> <li>• To improve control of manufacturing costs (1)</li> <li>• To reduce labour costs (1)</li> <li>• To improve consistency (1)</li> <li>• To improve process control (1)</li> <li>• To reduce wastage (1)</li> <li>• To reduce health and safety risks (1)</li> </ul> <p>Accept any other appropriate response</p> <p>Do not accept 'quicker', 'faster', 'cheaper' without clarification.</p> <p>No repetition</p> <p style="text-align: right;">(2 x 1)</p>	<b>(2)</b>
<b>11(b)</b>	<p>One mark for identifying each procedure, one mark for each extension:</p> <ul style="list-style-type: none"> <li>• Checking packs seals (1) with scanners/visually (1)</li> <li>• Checking codes (1) with scanners/visually (1)</li> <li>• Checking for packaging misprints (1) scanners/visually (1)</li> <li>• Checking pack/carton weights (1) using in-line weighing equipment/manually (1)</li> <li>• Checks for identifying damaged/non conforming product (1) using scanners/visually (1)</li> <li>• Checking for contamination (1) using metal detectors/x-ray equipment (1)</li> <li>• Product checks relating to taste/texture/colour(1) using digital images/scanners/ sensory techniques (1)</li> <li>• Checking moisture content (1) using electronic measuring apparatus (1)</li> </ul> <p>Accept any other appropriate response.</p> <p>Low response (1) or two low responses (2) or detailed response (2), for each of the three reasons</p> <p style="text-align: right;">(3 x 2)</p>	<b>(6)</b>

Question	Answer	Mark
<b>11(c)</b>	<p>One mark for identifying each benefit, one mark for each extension:</p> <ul style="list-style-type: none"> <li>• Early identification of non-conforming product (1) fewer customer complaints (1)</li> <li>• Avoids faulty products being dispatched (1) less returns (1)</li> <li>• Fewer product recalls (1) avoids dealing with customer complaints (1)</li> <li>• Minimises health risks associated with food products(1) negative effect on manufacturers reputation(1)</li> <li>• Improved product safety (1) less risk of making consumers ill (1)</li> <li>• Reduced risk of contamination (1) increased saleable/usable product life</li> <li>• More consistent/reliable product (1) increased customer confidence (1)</li> <li>• Increased sales/profit/turnover (1) improved manufacturers status (1)</li> </ul> <p>Accept any other appropriate response.</p> <p>Low response (1) or two low responses (2) or detailed response (2) for each of the two benefits.</p> <p style="text-align: right;">(2 x 2)</p>	<b>(4)</b>
<b>(Total 12 marks)</b>		

Question	Answer	Mark
<b>12(a)(i)</b>	<p>One mark for any of the following changes:</p> <ul style="list-style-type: none"> <li>• Reduced employment opportunities (1)</li> <li>• Increased competition for jobs (1)</li> <li>• Higher skill levels required (1)</li> <li>• Increased emotional stress (1)</li> <li>• Changes to work patterns (1)</li> <li>• Alterations to life style (1)</li> <li>• Changes to work requirements (1)</li> <li>• More training required (1)</li> <li>• Reduced physical demands (1)</li> </ul> <p>Accept any other appropriate response.</p> <p>Low response (1) or two low responses (2) or detailed response (2)</p> <p style="text-align: right;">(2x1)</p>	<b>(2)</b>
<b>12(a)(ii)</b>	<p>One mark for identifying effect, one mark for explanation:</p> <ul style="list-style-type: none"> <li>• Reduced noise pollution (1) – better designed equipment(1)</li> <li>• Better dust/fume extraction(1)- dedicated extraction/conditioning systems (1)</li> <li>• Improved temperature control (1) regulated air conditioning (1).</li> <li>• Cleaner (1)- improved equipment design (1)</li> <li>• Improved lighting (1) better designed illumination (1)</li> <li>• Improved safety (1) equipment fitted with safety sensors.</li> <li>• Fewer injuries (1) more space in workplace (1)</li> </ul> <p>Accept any other appropriate response.</p> <p>Low response (1) or two low responses (2) or detailed response (2) for each of the two effects</p> <p style="text-align: right;">(2x2)</p>	<b>(4)</b>
<b>12(b)</b>	<p>One mark for identifying benefit. One mark for explanation:</p> <ul style="list-style-type: none"> <li>• Improved appearance(1) more heat stable colours can lead to increased sales(1)</li> <li>• Better flavour/taste(1) improved flavour enhancers will help with repeat sales(1)</li> <li>• Extended shelf life(1) using preservatives will reduce customer waste and encourage</li> </ul>	<b>(4)</b>

Question	Answer	Mark
	<p>a purchase(1)</p> <ul style="list-style-type: none"> <li>• More nutritious /healthy(1) use of vitamin supplements will persuade customers to purchase(1)</li> <li>• Improved texture(1) inclusion of emulsifiers will improve eating qualities will lead to more sales(1)</li> <li>• Increased product volume/size(1) addition of raising agents will convey better value and increase sales(1)</li> </ul> <p>Accept any other appropriate response.</p> <p>Low response (1) or two low responses (2) or detailed response (2) for each of the two benefits</p> <p style="text-align: right;">(2x2)</p>	
<b>(Total 10 marks)</b>		

Question	Answer	Mark
<b>13</b>	<p>An answer that makes reference to the following points with explanation:</p> <ul style="list-style-type: none"> <li>• Guards/sensors on machinery (1)</li> <li>• Machinery can shut down/stop automatically (1)</li> <li>• Machinery can operate in hazardous environments (1)</li> <li>• Less human input at the production stage (1)</li> <li>• Reduced number of accidents (1)</li> <li>• Fewer fatigue related accidents (1)</li> <li>• Enables continuous processing with less risk of accidents (1)</li> <li>• Better process control less risk of injury (1)</li> </ul> <p>Or any other appropriate response</p> <p>e.g. control technology can shut down machinery automatically (1) which lowers the risk of injury (1)  better process control can reduce the number of accidents (1) as less human input is required at the production stage (1)</p> <p>Up to 4 low responses (4) or detailed response up to (4)</p> <p style="text-align: right;">(4x1)</p>	<b>(4)</b>
<b>(Total 4 marks)</b>		

Question	Answer	Mark
<p><b>14</b></p> <p><b>QWC i, ii, iii</b></p>	<p><b>Indicative content</b> Discussion may address the following issues:</p> <p><b>Impact</b> <u>Production efficiency</u></p> <p>Development</p> <ul style="list-style-type: none"> <li>• Improved throughputs achieved</li> <li>• Increased productivity</li> <li>• Can operate continuously</li> <li>• Does not tire</li> <li>• Can be modified/upgraded to increase efficiency</li> <li>• Able to operate in extreme/hazardous conditions</li> <li>• Lower levels of waste</li> </ul> <p>Or any other appropriate response</p> <p><b>Impact</b> <u>Product quality</u></p> <p>Development</p> <ul style="list-style-type: none"> <li>• Produces consistent /uniform products</li> <li>• Operates within closer tolerances</li> <li>• Higher level of precision</li> <li>• Produces products to specification</li> <li>• Reduced risk of error</li> <li>• Ability to extract non conforming product</li> </ul> <p>Or any other appropriate response</p> <p><b>Impact</b> <u>Manufacturing costs</u></p> <p>Development - 'Positive'</p> <ul style="list-style-type: none"> <li>• No wage costs</li> <li>• No holiday pay to 'factor in'</li> <li>• No national insurance, income tax, pension to 'factor in'</li> <li>• No sick pay/compensation costs</li> <li>• No redundancy costs</li> <li>• Lower energy costs i.e. can work in dark/cold/heat</li> <li>• Less non conforming product</li> <li>• Reduced waste</li> <li>• Lower raw materials costs</li> </ul>	<p><b>(6)</b></p>

Question	Answer	Mark
	<p>Or any other appropriate response.</p> <p>Development - 'Negative'</p> <ul style="list-style-type: none"> <li>• Expensive to maintain/service</li> <li>• Initial capital costs high</li> <li>• Replacement costs high</li> <li>• Updating/refurbishing costs high</li> <li>• Can breakdown increasing 'down time'</li> <li>• Can be inflexible</li> <li>• Malfunctions can be very disruptive/costly</li> </ul> <p>Or any other appropriate response.</p> <p>Example learner answer (level 3);  Robots are able operate continuously without getting tired or needing to take breaks this enables output to be increased which improves efficiency. There are no wages or other costs linked to employing people such as holiday pay, national insurance, pensions etc to pay which lowers manufacturing costs. Workplace lighting, heating / cooling is often not needed, so expenditure on energy is reduced. The reductions in manufacturing expenditure makes competitive pricing possible as these costs do not need to be 'factored in' when costing products. However, the initial purchase costs of robotics costs can be high and can also be expensive to maintain and repair if they breakdown. Robots are able to produce consistent products to precise specifications so waste is reduced and quality is maintained.</p>	
<b>(Total 6 marks)</b>		

Level	Mark	Descriptor
	<b>0</b>	No material deserving of reward
1	<b>1-2</b>	The learner identifies at least two impact related points linked to efficiency/product quality/manufacturing costs or gives a brief description of one inter-related impact, and shows some understanding of the topic. The learner uses everyday language and the response lacks clarity and organisation. Spelling, punctuation and the rules of grammar are used with limited accuracy.
2	<b>3-4</b>	The learner gives a brief description of at least two impact related points linked to efficiency/product quality/manufacturing costs or one inter-related detailed description. The learner uses some manufacturing/technological terms and shows some focus and organisation. Spelling, punctuation and the rules of grammar are used with some accuracy. Some spelling errors may still be found.
3	<b>5-6</b>	The learner gives a detailed explanation of at least three impact related points linked to efficiency/product quality/manufacturing costs or two inter-related detailed descriptions. The learner uses a range of appropriate manufacturing/technological terms and shows good focus and organisation. Spelling, punctuation and the rules of grammar are used with considerable accuracy.
		<b>(Total 6 marks)</b>
<b>Total Marks for Section B</b>		<b>60</b>
<b>Total Marks for the whole paper for Section A &amp; B</b>		<b>110</b>