

Mark Scheme (Results) Summer 2016

Pearson Edexcel GCSE
in Manufacturing & Engineering
(Paper 3C: Textiles and Clothing)

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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
1(a)	<ul style="list-style-type: none"> • Gym bag • Rug <p>If 3 boxes or more crossed - no marks.</p> <p style="text-align: right;">(2 x 1)</p>	(2)
1(b)	<ul style="list-style-type: none"> • School shirt • High-visibility jacket <p>If 3 boxes or more crossed - no marks.</p> <p style="text-align: right;">(2 x 1)</p>	(2)
(Total 4 marks)		

Question	Answer	Mark
2(a)(1)	<ul style="list-style-type: none"> • Computerised embroidery machine • Embroidery machine <p>Do not accept sewing machine</p> <p>Accept any recognisable spelling (phonetic) of the answer above. Accept brand names e.g. Janome embroidery machine</p> <p style="text-align: right;">(1 x 1)</p>	
2(a)(2)	<ul style="list-style-type: none"> • Tracing wheel • Dressmaker’s tracing wheel • Pattern tracer <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>	(2)
2(b) (1)	<p>An answer that makes reference to two of the following points:</p> <ul style="list-style-type: none"> • Used to create neat edges (1) • Used to finish armholes / necklines etc. (1) • Used to finish curved edges (1) • Used to cover piping cord (1) • Used as a finishing technique (1) <p>Accept any other appropriate response</p> <p>e.g. Used to create neat edges (1) around a neckline (1)</p> <p style="text-align: right;">(2X1)</p>	
2(b) (2)	<p>An answer that makes reference to two of the following points:</p> <ul style="list-style-type: none"> • Used to change colour / dye fabrics, yarns etc. (1) • Used with string / elastic bands (1) • To create patterns when tie-dyeing (1) • Used with wax (1) • To create patterns when doing batik (1) • Use with salt / fixative (1) <p>Accept any other appropriate response</p> <p>e.g. used to change the colour of fabric (1) when doing tie-dye (1)</p> <p style="text-align: right;">(2X1)</p>	(4)
(Total 6 marks)		

Question	Answer	Mark
<p>3</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>(Total 7 marks)</p>		

Question	Answer	Mark
4(a)	<p>Appropriate two products such as e.g.</p> <ul style="list-style-type: none"> • Baby carriers • Biker gloves • Rucksacks / sports bags • Swimsuits • Fire protective suit • Bullet proof vest • Oven gloves • Performance sports wear • Hiking boots • Weather protective jackets • Nightwear • Umbrella • Baseball cap • High-visibility jacket <p>A brand name of a specific product is acceptable</p> <p>This list is not exhaustive, accept any product from the textiles and clothing sectors that uses a joining process and automation in its manufacture</p> <p>(2 x 1)</p>	(2)
4(b)(i)	<p>Appropriate joining process suitable for the named product:</p> <ul style="list-style-type: none"> • Lock-stitching / Stitching / Sewing • Overlocking • Laminating • Heat sealing • Fusing <p>Accept answers naming specific types of appropriate processes</p> <p>Accept any appropriate response</p> <p>(1 x 1)</p>	(1)

Question	Answer	Mark
4(b)(ii)	<p>Lock-stitching / Stitching / Sewing</p> <ul style="list-style-type: none"> • Uses two threads, an upper and a lower (1) • The threads entwine together in the hole in the fabric which they pass through (1) • The stitching is very secure as it 'locks' into place on the fabric (1) • The stitching is produced in a long straight line (1) <p>Overlocking</p> <ul style="list-style-type: none"> • The stitching is produced over the edge of the fabric (1) • The edges of fabric are cut as they are fed through the machine (1) • Creates a 'finished' seam (1) • Very quick as number of processes are reduced (1) • Used for edging / hemming / seams (1) • Use multiple threads and needles (1) • Can be used for decoration / reinforcement / construction (1) <p>Laminating</p> <ul style="list-style-type: none"> • A way of joining many layers together (1) • Can use heat / adhesive / glue (1) • E.g. Goretex is laminated to fabrics for sportswear (1) <p>Heat sealing</p> <ul style="list-style-type: none"> • Application of tape to seams using heat (1) • Can use iron / heat press (1) • Makes the seam waterproof (1) • Used on outdoor garments / tents / sleeping bags etc (1) • Used for synthetic fibres made from thermoplastics, such as polyester or nylon (1) <p>Fusing</p> <ul style="list-style-type: none"> • Used to permanently join two fabrics together using an adhesive resin (1) • Used to reinforce textiles by the use of interfacing / Vilene etc (1) • Can use a flat-bed press for batch production (1) • Can use a conveyor press for mass production (1) 	(3)

Question	Answer	Mark
	<p>Accept any appropriate response.</p> <p>Answers must relate to the named product.</p> <p>No marks for repeating the joining 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 style="text-align: right;">(1 x 3)</p>	
4(c)	<p>One mark for each identification of example, one mark for each extension:</p> <ul style="list-style-type: none"> • Conveyor systems (1) transfer materials to manufacturing location (1) • Temperature control is automated (1) using thermostats (1) • Pick and place robots (1) assemble products continuously (1) • Labelling is applied continuously (1) at the packaging stage (1) • Product coding is applied (1) when packs are sealed automatically (1) • Remotely operated vehicles (1) move products to specified locations (1) • Linked PLCs (1) used to control manufacturing processes (1) <p>Accept any appropriate response.</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>	(4)
(Total 10 marks)		

Question	Answer	Mark
5(a)	<p>Accept reference to any of the following two functions:</p> <ul style="list-style-type: none"> • To create a design (1) • To modify a design (1) • To analyse a design (1) • To optimise a design (1) • To improve the quality of a design(1) • To improve the accuracy of a design (1) • To reduce the cost producing a design (1) • To render (1) • To convert 2D to 3D (1) • To produce nets (1) • To stress test (1) <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>	(2)
5(b)	<p>An answer that makes reference to two of the following disadvantages:</p> <ul style="list-style-type: none"> • Set-up costs would be high (1) as hardware/software is required (1) • Cost of training staff will increase (1) due to new skills required (1) • Extra maintenance costs (1) due to specialist technicians required (1) • Ongoing updating costs (1) due to new technological developments (1) • Security issues (1) due to possible loss of data/theft of data (1) • Data can be corrupted (1) due to software malfunction (1) <p>Accept any appropriate response.</p> <p>Low response (1) or two low responses (2) or detailed response (2)</p> <p>(1x2)</p>	(2)

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

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

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

Question	Answer	Mark
6(b)	<p>One mark for identifying each reason, one mark for each extension:</p> <ul style="list-style-type: none"> • Formulas used to generate results (1) meaning less risk of calculation errors (1) • Easier/efficient way of recording data (1) easier to edit (1) • Quicker presentation of information (1) which can be imported into charts/tables (1) • Can store a large amount of data (1) that can be used in decision-making (1) • Ability to share information (1) as data can be transferred electronically (1) • Can support management reports (1) as data can be modelled into 'what if' scenarios (1) <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>	(4)
(Total 9 marks)		

Question	Answer	Mark
7(a)	<p>One mark for identifying benefit, up to two marks for extension:</p> <ul style="list-style-type: none"> • Reduced use of paper (1) fewer trees would be needed (1) reducing global warming (1) • Reduced use of fossil fuels (1) to process paper materials (1) and carry out printing processes (1) • Lower carbon emissions (1) less fuel/energy needed manufacture printed materials (1) and transport them (1) • Reduced waste (1) less discarded paper (1) reducing need for recycling (1) • Less processing of raw materials (1) would reduce pollution (1) and improve health (1) • Reduces need to travel (1) to meet customers/clients (1) means less emissions from transport (1) <p>Accept any appropriate response.</p> <p>Up to 3 marks for a detailed response.</p> <p>(1x3)</p>	(3)

Question	Answer	Mark
7(b)	<p>One mark for identifying advantage, up to two marks for extension:</p> <ul style="list-style-type: none"> • Instant contact with potential customers (1) at low cost (1) to quickly obtain feedback (1) • Able to contact existing customers database (1) and target a wider audience (1) more efficiently (1) • Ability to change/modify marketing strategies quickly (1) to maximise potential sales (1) and achieve targets (1) • Can choose an appropriate communication system (1) to target potential customer sectors/groups (1) more quickly (1) • Allows for paperless marketing(1) reducing printing costs (1) and be updated easily (1) • Reduces time (1) to mail materials (1) which also reduces labour costs (1) • Reduces cash outlay producing printed materials (1) reduces storage space requirement (1) and potential waste of out of date materials (1) <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. (1x3)</p>	(3)
(Total 6 marks)		
Total Marks for Section A		50

Question	Answer	Mark
<p>8(a)</p>	<p>An answer that makes reference to any of the following points:</p> <ul style="list-style-type: none"> • To fasten the bag (1) • To secure the contents (1) • To open / close the bag (1) • To gain quick & easy access (1) • As a decorative feature (1) <div style="text-align: center;">  </div> <p><i>The zip fastens the bag and keeps the contents secure</i></p> <p>Accept any other appropriate response.</p> <p>Answer must contain both notes and sketches.</p> <p>Max two marks if only notes or sketches used.</p> <p style="text-align: right;">(3 x1)</p>	<p>(3)</p>
<p>8(b)</p>	<p>An answer that makes reference to any of the following points:</p> <ul style="list-style-type: none"> • Allows the user to hang up the toiletry bag (1) • Allows the bag to keep the contents upright (1) • Can stop bottle from leaking as the hook keeps the bag upright (1) • Allows you to access all areas of the bag when it is hanging up (1) 	<p>(3)</p>

Question	Answer	Mark
	 <p><i>The hook allows the toiletry bag to be hung up.</i></p> <p><i>This therefore makes sure that bottles stand upright so that they don't leak.</i></p> <p>Accept any other appropriate response.</p> <p>Answer must contain both notes and sketches. Max two marks if only notes or sketches used.</p> <p>(3x1)</p>	
<p>8(c)</p>	<p>An answer that makes reference to any of the following points:</p> <ul style="list-style-type: none"> <li>• Allows contents to be organised (1) <li>• Allows the user to see what is in each pocket (1) <li>• Can dry quickly if they get wet (1) <li>• Prevents the contents from getting mouldy as they are breathable (1)  <p><i>The pockets are see-through and therefore allow the user to see what is stored in each pocket. If they get wet in the shower then nylon will dry quickly so that the contents do not go mouldy.</i></p> <p>Accept any other appropriate response.</p> <p>Answer must contain both notes and sketches. Max two marks if only notes or sketches used.</p> <p>(3x1)</p>	<p>(3)</p>
<p>(Total 9 marks)</p>		

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

Question	Answer	Mark
<p>9(c)</p>	<ul style="list-style-type: none"> • Liaison with administration departments (1) <p>Accept any other appropriate response but must be related to the manufacture of toiletry bags</p> <p>e.g. at the materials supply and control stage stock levels of fabrics & components would be checked (1) and coding inspections of all the materials would be carried out (1) before collating the internal material 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>(1 x 3)</p>	<p>(3)</p>
<p>(Total 9 marks)</p>		

Question	Answer	Mark
10(a)	<ul style="list-style-type: none"> • Nylon • Polyester • Oil cloth • Tarpaulin • Coated fabric • Laminated fabric <p>Accept any other appropriate response. Accept appropriate trade name.</p> <p>Accept any recognisable spelling (phonetic) of the answers above.</p> <p>(1 x1)</p>	(1)
10(b)(i)	<p>Any three of the following:</p> <ul style="list-style-type: none"> • Grading • Lay planning • Spreading • Folding • Cutting • Die cutting • Fusing • Bonding • Sewing / stitching / lock stitching • Moulding • Overlocking <p>Accept any other appropriate response.</p> <p>Accept any recognisable spelling (phonetic) of the answers above.</p> <p>(3x1)</p>	(3)

Question	Answer	Mark
10(b)(ii)	<p>An explanation that makes reference to three of the following points:</p> <ul style="list-style-type: none"> • Efficient production method (1) • High production throughput (1) • Can be mass produced easily (1) • Cost effective (1) • Better process control (1) • Reliable process (1) • Minimal waste (1) • Product have consistent quality (1) <p>Accept any other appropriate response.</p> <p>e.g. this is an automated process (1) that produces minimal waste (1) with a consistent quality (1)</p> <p>3x1 marks for 3 low responses or up to 3 marks for a detailed response</p> <p>(3x1)</p>	(3)
10(c)	<p>An explanation that makes reference to three of the following points:</p> <ul style="list-style-type: none"> • Improved product life span (1) • Improved product consistency (1) • Improved product properties (1) • Fewer reject products (1) • Less rework (1) • Less energy required (1) • Reduce product fragility (1) <p>Accept any other appropriate response</p> <p>e.g. modern materials increase a products life span (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>(1x3)</p>	(3)
(Total 10 marks)		

Question	Answer	Mark
11(a)	<p>Any two of the following reasons:</p> <ul style="list-style-type: none"> • To improve efficiency (1) • To improve throughput/output (1) • To reduce manufacturing costs (1) • To improve control of manufacturing costs (1) • To reduce labour costs (1) • To improve consistency (1) • To improve process control (1) • To reduce wastage (1) • To reduce health and safety risks (1) <p>Accept any other appropriate response</p> <p>Do not accept 'quicker', 'faster', 'cheaper' without clarification.</p> <p>No repetition</p> <p>(2x1)</p>	(2)
11(b)	<p>One mark for identifying each procedure, one mark for each extension:</p> <ul style="list-style-type: none"> • Checking packs seals (1) with scanners/visually (1) • Checking codes (1) with scanners/visually (1) • Checking for packaging misprints (1) scanners/visually (1) • Checking pack/carton weights (1) using in-line weighing equipment/manually (1) • Checks for identifying damaged/non conforming product (1) using scanners/visually (1) • Checking for foreign bodies (1) using metal detectors/x-ray equipment (1) <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>(3x2)</p>	(6)

Question	Answer	Mark
11(c)	<p>One mark for identifying each benefit, one mark for each extension:</p> <ul style="list-style-type: none"> • Early identification of non-conforming product (1) fewer customer complaints (1) • Avoids faulty products being dispatched (1) less returns (1) • Fewer product recalls (1) avoids dealing with customer complaints (1) • Improved product safety (1) less risk of client injuries (1) • More consistent/reliable product (1) increased customer confidence (1) • Increased sales/profit/turnover (1) improved manufacturers status (1) <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>(2x2)</p>	(4)
(Total 12 marks)		

Question	Answer	Mark
12(a)(i)	<p>One mark for any of the following changes:</p> <ul style="list-style-type: none"> • Reduced employment opportunities (1) • Increased competition for jobs (1) • Higher skill levels required (1) • Increased emotional stress (1) • Changes to work patterns (1) • Alterations to life style (1) • Changes to work requirements (1) • More training required (1) • Reduced physical demands (1) <p>Accept any other appropriate response.</p> <p>Low response (1) or two low responses (2) or detailed response (2)</p> <p>(2x1)</p>	(2)
12(a)(ii)	<p>One mark for identifying effect, one mark for explanation:</p> <ul style="list-style-type: none"> • Reduced noise pollution (1) – better designed equipment (1) • Better dust/fume extraction(1) - dedicated extraction/conditioning systems (1) • Improved temperature control (1) regulated air conditioning (1) • Cleaner (1) - improved equipment design (1) • Improved lighting (1) better designed illumination (1) • Improved safety (1) equipment fitted with safety sensors • Fewer injuries (1) more space in workplace (1) <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>(2x2)</p>	(4)

Question	Answer	Mark
12(b)	<p>One mark for identifying benefit. One mark for explanation:</p> <ul style="list-style-type: none"> • Improved appearance (1) range of finishes/ colours can lead to increased sales (1) • Improved product quality (1) will help with repeat sales (1) • Better strength to weight ratio (1) to improve product durability (1) • Materials can be cheaper to purchase/manufacture (1) therefore increasing company profits (1) • Can be constructed easier (1) leading to more consistent products being produced (1) <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>(2x2)</p>	(4)
(Total 10 marks)		

Question	Answer	Mark
13	<p>An answer that makes reference to the following points with explanation:</p> <ul style="list-style-type: none"> • Guards/sensors on machinery (1) • Machinery can shut down/stop automatically (1) • Machinery can operate in hazardous environments (1) • Less human input at the production stage (1) • Reduced number of accidents (1) • Fewer fatigue related accidents (1) • Enables continuous processing with less risk of accidents (1) • Better process control less risk of injury (1) <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) and 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>(4x1)</p>	(4)
(Total 4 marks)		

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

Question	Answer	Mark
	<p>Or any other appropriate response.</p> <p>Development - 'Negative'</p> <ul style="list-style-type: none"> • Expensive to maintain/service • Initial capital costs high • Replacement costs high • Updating/refurbishing costs high • Can breakdown increasing 'down time' • Can be inflexible • Malfunctions can be very disruptive/costly <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>	
(Total 6 marks)		

Level	Mark	Descriptor
	0	No material deserving of reward
1	1-2	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	3-4	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	5-6	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.
		(Total 6 marks)
Total Marks for Section B		60
Total Marks for the whole paper for Section A & B		110