

Mark Scheme (Results)

Summer 2016

Pearson Edexcel GCE  
in Design & Technology (6RM03/01) Paper 1

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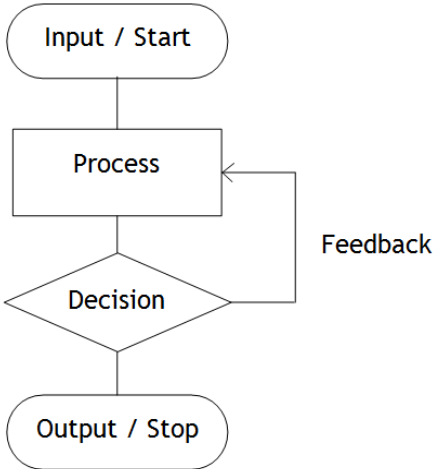
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## General Marking Guidance

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates 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 candidate'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 candidate's response, the team leader must be consulted.
- Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

Question Number	Answer	Mark
<b>1(a) i</b>	<ol style="list-style-type: none"> <li>1. Able to use cheaper centre layers/only need to use more expensive material on outer layer(s) (1)</li> <li>2. More stable/do not warp/misshape (1)</li> <li>3. More complex/curved shapes can be achieved easily/easily bent to shape (1)</li> <li>4. Increased integral strength/good strength to weight/no short grain/ no knots/knots removed (1)</li> <li>5. A wide range of different surface laminates is possible/ a range of designs is possible (1)</li> <li>6. Easy-clean laminates can be used (1)</li> <li>7. Flexible/allows for natural spring/suspension/give in the frame (1)</li> <li>8. Shapes not limited by size of solid timber (1)</li> <li>9. Less waste produced/ use up all/most of the timber (1)</li> </ol> <p style="text-align: right;">(4 x 1)</p>	<b>(4)</b>
<b>1(a) ii</b>	<ol style="list-style-type: none"> <li>1. High set up costs for industrial production (1)</li> <li>2. Only suitable for batch/high volume production (1)</li> <li>3. Thin construction means specialised fixing need to be used (1)</li> <li>4. Edges may need covering (1)</li> <li>5. Delamination (1)</li> </ol> <p style="text-align: right;">(2 x 1)</p>	<b>(2)</b>
<b>1(b)</b>	<ol style="list-style-type: none"> <li>1. To plan for future activities/decision making/ predict future market conditions/ when to release/ stock products/ new products (1)</li> <li>2. Work out/ learn/ show the company who/ where their target market is/ should be/and what they want/need (1)</li> <li>3. Predict expansion/ reduction of manufacture/workforce (1)</li> <li>4. Estimate capital outlay (1)</li> <li>5. Pricing analysis/ see what things are selling for/ work out best/ most competitive pricing structure for sales/ materials/ manufacturing (1)</li> <li>6. How to promote/ advertise/ increase company profile</li> <li>7. Customer feedback analysis and response to feedback (1)</li> <li>8. See what is happening in the market to maintain/ gain an edge over competitors/ watch/ keep an eye on what competitors are doing/ producing/ keeping up with/ detect trends/ gaps in the market (1)</li> <li>9. Obtain correct/relevant/suitable anthropometric data/design for maximum number of people/5-95 percentile (1)</li> </ol> <p style="text-align: right;">(4 x 1)</p>	<b>(4)</b>
<b>Total for question</b>		<b>10</b>

Question Number	Answer	Mark
<b>2(a)</b>	<p>Any two pairs of correctly linked items from the following:</p> <ol style="list-style-type: none"> <li>1. Items are located/ retrieved / delivered faster /more accurately/ right place right time (1)</li> <li>2. More efficient/ faster business/ company/ production line/ lean manufacturing time to market/ lead time (1)</li> <li>3. Items are easily catalogued / recorded/ on central database (1)</li> <li>4. Automatically reordered/never run out of stock/ reduced human error (1)</li> <li>5. They can lift heavy loads (1)</li> <li>6. Safer/ reduced H&amp;S issues (1)</li> <li>7. They can stack products in a more organised way/ higher (1)</li> <li>8. Reduced required floor space/ land costs/ better use of space (1)</li> <li>9. They require very little manual input/ run 24/7/ fully automated (1)</li> <li>10. Reduced costs/ wages/ employment (1)</li> </ol> <p style="text-align: right;">(2 x 2)</p>	<b>(4)</b>
<b>2(b)(i)</b>	<ol style="list-style-type: none"> <li>1. input (start), process, output (stop) (1) – all 3 required for 1 mark</li> <li>2. decision / feedback (1) – both required for 1 mark</li> </ol> <div style="text-align: center;">  <pre> graph TD     Start([Input / Start]) --&gt; Process[Process]     Process --&gt; Decision{Decision}     Decision --&gt; Stop([Output / Stop])     Decision -- Feedback --&gt; Process </pre> </div> <p>The boxes MUST be the correct shape to score the marks</p> <p style="text-align: right;">(2 x 1)</p>	<b>(2)</b>

<b>2(b)(ii)</b>	<p>Any two pairs of correctly linked items from the following:</p> <ol style="list-style-type: none"> <li>1. Feedback/QC checks are made/ used/carried out constantly (1)</li> <li>2. Improved/maintained control/accuracy of stock/material/product levels/quality/right first time/less faults (1)</li> <li>3. Improved tracking of performance (1)</li> <li>4. Able to predict maintenance / failure points (1)</li> <li>5. Early detection of faults (1)</li> <li>6. Reduced waste (1)</li> <li>7. Requires no human intervention (1)</li> <li>8. Reduced labour costs (1)</li> <li>9. Reduced human error / increased reliability (1)</li> <li>10. Increased/faster/quicker productivity/checking /cost saving/less time to market (1)</li> <li>11. Ability to adapt/make changes/decisions (1)</li> <li>12. More flexibility/customisation possible within the system (1)</li> </ol> <p style="text-align: right;">(2 x 2)</p>	<b>(4)</b>
	<b>Total for question</b>	<b>10</b>

Question Number	Answer	Mark
<b>3(a)</b>	1. Workers replaced by machines (1) 2. Low job satisfaction/ morale/ self-pride in the work (1) 3. Low wages (1) 4. Poor quality living conditions/ poverty (1) 5. Sweatshop employment/ long hours/ few breaks (women/children) (1) 6. Poor/ unsafe/ bad working conditions (1) 7. Uprisings/ strikes/ friction/ resentment (1) 8. Unemployment/ less employment/ less demand for labour (1) <div style="text-align: right;">(4 x 1)</div>	<b>(4)</b>
<b>3(b)</b>	1. Food e.g. change in diet to more environmentally friendly/ organic foods (1) 2. Purchasing / producing/ switching to green/ renewable energy e.g. solar panels / turbines (1) 3. Household energy efficiency e.g. insulation, double glazing, turning things off/ down (standby)/ closing windows/ shutting doors (1) 4. Energy and water efficient appliances e.g. dishwasher, washing machine, kettle, vacuum cleaner, light bulbs/ water heaters/full load washing/ dishwashing, eco-cycles used/ shower instead of bath (1) 5. Efficient transport e.g. walk, cycle, public transport, hybrid cars, drive efficiently/ shortest route/ avoid traffic/ car sharing (1) 6. Recycle, reuse, refill/ repair and avoid pointless purchases/ only buy products which are recyclable/ green rather than made of finite materials/ only buy products with minimum/ recyclable packaging (1) 7. Telecommute and teleconferencing (1) 8. Buy local produce/ produce home grown/ allotment (1) 9. Offsetting e.g. planting a tree, financing offsetting measures (1) <div style="text-align: right;">(6 x 1)</div>	<b>(6)</b>
<b>Total for question</b>		<b>10</b>

Question Number	Answer	Mark
4	<p>Use any <b>ten</b> of the following answers.</p> <p>Raw materials</p> <ol style="list-style-type: none"> <li>1. Use less material (<b>example answer</b>) (<b>no marks to be awarded</b>)</li> <li>2. Use materials/extraction methods which cause less environmental impact/easier to extract (1)</li> <li>3. Use recyclable/ recycled /renewable /sustainable /biodegradable /degradable materials (1)</li> <li>4. Follow relevant legislation (1)</li> <li>5. Use materials which are in close supply (1)</li> <li>6. Use materials from managed stock (1)</li> </ol> <p>Manufacture</p> <ol style="list-style-type: none"> <li>7. Reduce energy use/emissions wherever possible (1)</li> <li>8. Simplify process if possible/reduced wasted time (1)</li> <li>9. Reduce/reuse/safe disposal of waste (1)</li> <li>10. Use natural resources as efficiently as possible (1)</li> <li>11. Reduce the number of components/range of materials needed (1)</li> <li>12. Reduce weight (1)</li> <li>13. Improve workflow (1)</li> </ol> <p>Distribution</p> <ol style="list-style-type: none"> <li>14. Reduced/lightened/efficient packaging (1)</li> <li>15. Reduce mileage to suppliers / customers (1)</li> <li>16. Use most efficient modes/types/routes/times of transport (1)</li> <li>17. Improve driving attitude/style of staff (1)</li> <li>18. Bulk methods for distribution (1)</li> </ol> <p>Use</p> <ol style="list-style-type: none"> <li>19. Increase durability/length of life of products (1)</li> <li>20. Encourage use of refillable products (1)</li> <li>21. Use 'green' credentials as a positive marketing strategy (1)</li> <li>22. Promote efficient use of a product/energy efficient products (1)</li> <li>23. Encourage/facilitate repair / Replaceable components (1)</li> </ol> <p>End of life</p> <ol style="list-style-type: none"> <li>24. Can be reused (1)</li> <li>25. Can be recycled / recyclable (1)</li> <li>26. Reduce waste to landfill (1)</li> <li>27. Can biodegrade/degrade (1)</li> </ol> <p style="text-align: right;">(10 x 1 )</p>	<b>(10)</b>
<b>Total for question</b>		<b>10</b>



Question Number	Answer	Mark
<b>5</b>	<p>Advantages:</p> <ol style="list-style-type: none"> <li>1. Able to react to/instigate changes quickly / respond to market changes/ trends/ demand/ wider range of products / process more than one product style at a time (1)</li> <li>2. Shorter lead times/ faster to market (1)</li> <li>3. Increased market share/ sales (1)</li> <li>4. Batch sizes match demand (1)</li> <li>5. Reduced stock/ capital/ storage tied up (1)</li> <li>6. Customised products (1)</li> <li>7. Lower labour costs (1)</li> </ol> <p>Disadvantages:</p> <ol style="list-style-type: none"> <li>8. High setup/ maintenance costs (1)</li> <li>9. Production rate slower than dedicated automated machinery (1)</li> <li>10. Staff are expensive/ need to be trained/ retrained (1)</li> <li>11. Downtime due to reprogramming (1)</li> <li>12. A larger amount of managing/ pre-planning/ mapping is needed/ difficult(1)</li> <li>13. Higher product cost (1)</li> </ol> <p>Maximum of 9 marks if answer comes from only advantages or disadvantages</p> <p style="text-align: right;">(10 x 1)</p>	<b>(10)</b>
	<b>Total for question</b>	<b>10</b>

Question Number	Answer	Mark						
<b>6(a)</b>	<p>Art nouveau designers were heavily influenced by the following:</p> <table border="1"> <thead> <tr> <th>Nature/Organic forms (1)</th> <th>Human/female Form (1)</th> <th>Other Cultures (1)</th> </tr> </thead> <tbody> <tr> <td>           Flowers            Plants            Leaves            Buds            Roots            Peacocks            Seed pods            Insect wings             (1)         </td> <td>           Languid lines            Curvy/circular            Waves            Female figure/body            Flowing hair            Intertwined            Ribbon patterns            Undulating            Fluid/Fluidity            Dripping/molten            Swirls             (1)         </td> <td>           Stylised vertical lines            Asymmetrical lines            Block prints            Celtic            Japanese            Egyptian            Whiplash            Motifs             (1)         </td> </tr> </tbody> </table> <p>Maximum of one mark from each box, but they do not have to come from the box directly below the headings.</p> <p>Sample answers:            Designers were influenced by nature (1) e.g. the natural form of leaves (1)            Designers were influenced by nature (1) using the fluidity of falling water to influence their designs (1)</p> <p style="text-align: right;">(3 x 2)</p>	Nature/Organic forms (1)	Human/female Form (1)	Other Cultures (1)	Flowers Plants Leaves Buds Roots Peacocks Seed pods Insect wings  (1)	Languid lines Curvy/circular Waves Female figure/body Flowing hair Intertwined Ribbon patterns Undulating Fluid/Fluidity Dripping/molten Swirls  (1)	Stylised vertical lines Asymmetrical lines Block prints Celtic Japanese Egyptian Whiplash Motifs  (1)	<b>(6)</b>
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<b>6(b)</b>	<p>Form &amp; Function:</p> <ol style="list-style-type: none"> <li>1. Comfort/ ergonomic/ anthropometric/ ease of use (1)</li> <li>2. Shiny finish/ slippery (1)</li> <li>3. The looks as a piece of art/ sculpture/ contributing to the environment is of prime importance (1)</li> <li>4. Organic/ natural look/ curves/ fluid/ flowing/ languid (1)</li> <li>5. Safety (1)</li> <li>6. No sharp edges (1)</li> <li>7. No unnecessary decoration/ one piece moulding (1)</li> <li>8. Range of cross rail heights to rest feet/ accommodates different leg lengths / rest legs against (1)</li> <li>9. Base/ frame looks stable/ sturdy/ safe/ balanced (1)</li> <li>10. Frame is strong enough to support a person/ yet lightweight/ minimal material used (1)</li> <li>11. The height of the stool has been determined by its use (1)</li> </ol> <p style="text-align: right;">(4 x 1)</p>	<b>(4)</b>						
<b>Total for question</b>		<b>10</b>						

Question Number	Answer	Mark
<p><b>7</b></p>	<p>Advantages</p> <ol style="list-style-type: none"> <li>1. Ideal for repetitive/ monotonous/ consistent accuracy/ less waste/ fewer human errors/ high quality (1)</li> <li>2. Increased productivity/can work faster / no need for breaks/ work all hours / 24-7/ do not lose concentration/ don't get tired (1)</li> <li>3. Able to carry heavy loads (1)</li> <li>4. Reprogrammable/ flexible/ updated (1)</li> <li>5. Able to complete complex tasks (1)</li> <li>6. Reduced labour costs (1)</li> <li>7. Can be used in hazardous environments (1)</li> <li>8. Can be linked to automated inspection systems (1)</li> <li>9. The array of robot sensors is greater than humans (1)</li> </ol> <p>Disadvantages</p> <ol style="list-style-type: none"> <li>10. High set-up costs (1)</li> <li>11. Cannot learn/ adapt/ make decisions/ less flexible than humans (1)</li> <li>12. High cost of making robot cells safe/or humans have to be excluded (1)</li> <li>13. Range of languages/ compatibility issues (1)</li> <li>14. Reduced employment/ increased unemployment (1)</li> <li>15. Need for staff to be trained/ retraining (1)</li> <li>16. Decreased ownership/ interest/ morale of workers (1)</li> </ol> <p>Maximum of 9 marks if answer comes from only advantages or disadvantages</p>	<p style="text-align: right;"><b>(10)</b></p>
<b>Total for question</b>		<b>10</b>