

Mark Scheme (Results)

Summer 2013

GCSE Design & Technology Electronic  
Products (5EP02/01)

Knowledge & Understanding of  
Electronic Products

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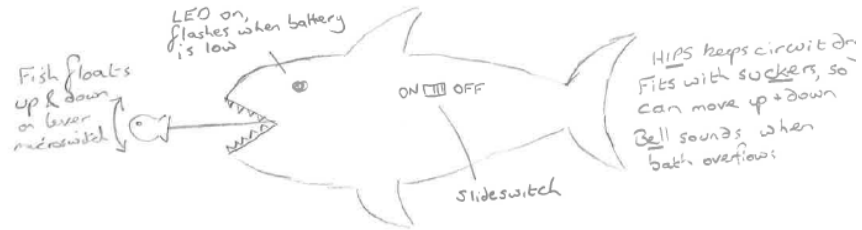
Question Number	Answer	Mark
1	A	1
Question Number	Answer	Mark
2	C	1
Question Number	Answer	Mark
3	D	1
Question Number	Answer	Mark
4	C	1
Question Number	Answer	Mark
5	A	1
Question Number	Answer	Mark
6	B	1
Question Number	Answer	Mark
7	A	1
Question Number	Answer	Mark
8	D	1
Question Number	Answer	Mark
9	B	1
Question Number	Answer	Mark
10	B	1

Question Number	Answer	Mark										
11. (a)	<table border="1"> <thead> <tr> <th>Name</th> <th>Use</th> </tr> </thead> <tbody> <tr> <td>LED Dot Matrix Display</td> <td>To display information / symbols / numbers / letters (1)</td> </tr> <tr> <td>Multimeter</td> <td>To test circuits / to see if components work/to find faults / measuring values/to test continuity (1)</td> </tr> <tr> <td>Rocker Single pole single throw SPST (1)</td> <td>To turn a circuit on or off</td> </tr> <tr> <td>Solder sucker / desoldering pump / desoldering tool (1)  Do not accept: <ul style="list-style-type: none"><li>Solder remover</li></ul></td> <td>To remove excess solder</td> </tr> </tbody> </table>	Name	Use	LED Dot Matrix Display	To display information / symbols / numbers / letters (1)	Multimeter	To test circuits / to see if components work/to find faults / measuring values/to test continuity (1)	Rocker Single pole single throw SPST (1)	To turn a circuit on or off	Solder sucker / desoldering pump / desoldering tool (1)  Do not accept: <ul style="list-style-type: none"><li>Solder remover</li></ul>	To remove excess solder	4
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Question Number	Answer	Mark										
11.(b)	A - Capacitor/ Polarised Capacitor/ Electrolytic Capacitor (1 x 1)	1										
	B - 555/555 timer/timer/timer chip/IC/integrated circuit/ Microchip (1 x 1)	1										
	C - lamp/bulb (1 x 1)	1										
Question Number	Answer	Mark										
11.(c)	Because more current is needed (1) than the IC can supply (1) To amplify current (1) to power/drive the output (1) (1 X 2)	2										
Question Number	Answer	Mark										
11.(d)(i)	Only two acceptable responses: Replace the capacitor (1) with a variable capacitor (1) Replace the 100k resistor (1) with a variable resistor (1) (2 x 1)	2										

Question Number	Answer	Mark
11.(d)(ii)	<p>Any two from:  Faster/easier to produce (1)  Faster/easier to change (1)  Components are reusable/repositionable (1)  No specialist equipment needed (1)  Breadboard is reusable (1)  No soldering required (1)</p> <p>Do not accept unqualified:</p> <ul style="list-style-type: none"> <li>• cheaper/faster</li> </ul> <p style="text-align: right;">(2 x 1)</p>	2
Question Number	Answer	Mark
11.(e)	<p>One mark for each correct response in the correct position  Band 1 - Brown  Band 2 - Black  Band 3 - Yellow</p> <p>[only acceptable answers]</p> <p style="text-align: right;">(3 x 1)</p>	3
Question Number	Answer	Mark
11.(f)(i)	<p>Any two from:  Easily formed/worked/doesn't require expensive tools (1)  Available in many thicknesses (1)  Easily painted/veneered (1)  Readily accepts adhesives (1)  Electrical insulator (1)  Renewable (1)  Easy to recycle (1)  Durable/Robust/Tough (1)</p> <p>Do not accept:</p> <ul style="list-style-type: none"> <li>• Strong</li> </ul> <p style="text-align: right;">(2 x 1)</p>	2

Question Number	Answer	Mark
11.(f)(ii)	Accept any one from:  Burning (1) bio-fermentation (1) <p style="text-align: right;">(1 x 1)</p>	1
Question Number	Answer	Mark
12.	<p><b>Design idea 1</b></p> <p>Candidates may answer any specification point in either graphical form or by annotation.</p> <p><b>No marks are awarded for the quality of graphical communication.</b></p> <ul style="list-style-type: none"> <li>• have a 'water' theme appropriate for children (1) : e.g. dolphins, waves, blue colouring</li> <li>• easily fix to the side of the bath (1) : e.g. suckers, hook over side of bath</li> <li>• have a means of sensing the water-level (1) : e.g. float switch, two metallic contacts, jack plug</li> <li>• be adjustable for different water levels (1) : e.g. telescopic mount, screw thread, slot and nut, slide mechanism (must be stated)</li> <li>• have an audible alarm if the bath overfills (1) : e.g. buzzer, Piezo-sounder, loud speaker, siren</li> <li>• be able to be switched on and off (1) : e.g. slide switch, toggle, push to make, rocker [Do not accept 'switch' on its own]</li> <li>• show the user when batteries are low (1) : e.g. LED, bar graph display, meter, specified audible device</li> <li>• be made from an insulating material (1) : e.g. acrylic, HIPS, any named polymer or wood</li> </ul> <p style="text-align: right;">(8 x 1)</p>	

Example of candidate response:

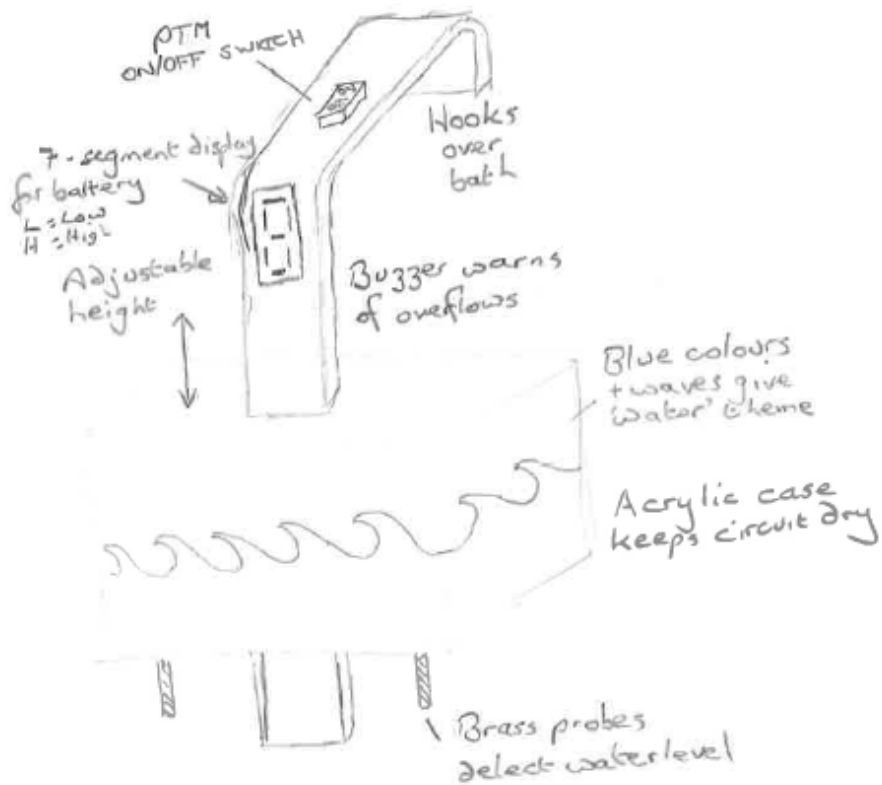


## Design idea 2

Marks for design idea 2 can only be awarded where specification points are resolved differently than in design idea 1.

16

Example of candidate response:



(8 x 1)

Question Number	Answer	Mark
13.(a)	<p>Accept any <b>two</b> of the following:</p> <p>Available in many colours (1)  Easily moulded (1)  Low cost material (1)  Smooth finish (1)  Can be recycled (1)  Lightweight (1)  Tough/high impact strength/won't break easily(1)  Waterproof (1)</p> <p>Do not accept:</p> <ul style="list-style-type: none"> <li>• Strong</li> </ul> <p style="text-align: right;">(2 x 1)</p>	2
Question Number	Answer	Mark
13.(b)	<p>Accept 'mix &amp; match' if feature &amp; justification are linked.</p> <p><b>One</b> explanation from:</p> <p>Very accurate (1) to achieve complex shapes (1)  Minimal waste (1) because scrap can be reused (1)  Can produce shapes with holes (1) in a single operation (1)  Suitable for high speed production (1) enabling high volume output (1)  Parts can be connected (1) without adhesives or fixings (1)</p> <p style="text-align: right;">(2 x 2)</p>	4
Question Number	Answer	Mark
13.(c)(i)	<p><b>One</b> explanation from:</p> <p>It has large buttons (1) which are easy to press/see (1)  There are few buttons (1) which avoids confusion (1)  There is no writing (1) so it is universally useable (1)</p> <p style="text-align: right;">(2 X 1)</p>	2
Question Number	Answer	Mark
13.(c)(ii)	<p><b>One</b> explanation from:</p> <p>There is a volume adjustment (1) which the user can turn down (1)  There is a socket under the phone (1) so the user can use an earpiece which won't disturb others (1)</p> <p style="text-align: right;">(2 X 1)</p>	2



Question Number	Answer	Mark												
13. (d) QWC	<p>Evaluation to address the following issues:</p> <table border="1"> <thead> <tr> <th>Disposable batteries</th> <th>Rechargeable batteries</th> </tr> </thead> <tbody> <tr> <td>Cheaper to buy initially, but more expensive long term</td> <td>High initial cost is spread over long life of battery</td> </tr> <tr> <td>Don't need recharging therefore do not need recharging equipment/mains access</td> <td>Rechargeable at home is much quicker than buying new</td> </tr> <tr> <td>Shorter life leads to need to replace frequently</td> <td>Still able to use phone while charging</td> </tr> <tr> <td>Chemical content causes environmental problems because of shorter life span</td> <td>Mains access required for charging</td> </tr> <tr> <td>Faster to change rather than recharge</td> <td>Don't have to open casing to access batteries</td> </tr> </tbody> </table> <p>For full marks, candidate must discuss <b>both</b> types of battery.</p> <p style="text-align: right;">(6 x 1)</p>	Disposable batteries	Rechargeable batteries	Cheaper to buy initially, but more expensive long term	High initial cost is spread over long life of battery	Don't need recharging therefore do not need recharging equipment/mains access	Rechargeable at home is much quicker than buying new	Shorter life leads to need to replace frequently	Still able to use phone while charging	Chemical content causes environmental problems because of shorter life span	Mains access required for charging	Faster to change rather than recharge	Don't have to open casing to access batteries	6
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Level	Mark	Descriptor												
	0	No rewardable material												
Level 1	1-2	Candidate identifies the area(s) of comparison with no development OR identifies and develops one area. Shows limited understanding of the comparison. Writing communicates ideas using everyday language but the response lacks clarity and organisation. The candidate spells, punctuates and uses the rules of grammar with limited accuracy.												
Level 2	3-4	Candidate identifies some areas of comparison with associated developments showing some understanding of the comparison. Writing communicates ideas using D&T terms accurately and showing some direction and control in the organising of material. The candidate uses some of the rules of grammar appropriately and spells and punctuates with some accuracy, although some spelling errors may still be found.												
Level 3	5-6	Candidate identifies a range of areas of comparison with associated developments showing a detailed understanding of the comparison. Writing communicates ideas effectively, using a range of appropriately selected D&T terms and organising information clearly and coherently. The candidate spells, punctuates and uses the rules of grammar with considerable accuracy.												

Question Number	Answer	Mark																																													
14.(a)	Give one mark for each correct response in the correct box  Wait 5 seconds (1) Turn output off (1) Wait 3 seconds (1) Feedback loop from bottom to diamond or above diamond (1) Feedback loop from N to above diamond (1)  <div style="text-align: right;">(5 X 1)</div>	5																																													
Question Number	Answer	Mark																																													
14.(b)	Award one mark for each correct row.  <table border="1" data-bbox="373 741 1118 1357" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>A</th> <th>B</th> <th>C</th> <th>D</th> <th>Q</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td style="background-color: #cccccc;">0</td> </tr> <tr> <td>0</td> <td>0</td> <td>1</td> <td style="background-color: #cccccc;">0</td> <td>1</td> </tr> <tr> <td>0</td> <td>1</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>0</td> <td>1</td> <td>1</td> <td>0</td> <td>0</td> </tr> <tr> <td>1</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>1</td> <td>0</td> <td>1</td> <td>0</td> <td>0</td> </tr> <tr> <td>1</td> <td>1</td> <td>0</td> <td style="background-color: #cccccc;">1</td> <td style="background-color: #cccccc;">1</td> </tr> <tr> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> </tr> </tbody> </table> <div style="text-align: right; margin-top: 10px;">(3 X 1)</div>	A	B	C	D	Q	0	0	0	0	0	0	0	1	0	1	0	1	0	0	0	0	1	1	0	0	1	0	0	0	0	1	0	1	0	0	1	1	0	1	1	1	1	1	1	1	3
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14.(d)i	<ul style="list-style-type: none"> <li>• Pause / rewinds live programmes (1)</li> <li>• Higher quality pictures/sound (1)</li> <li>• More channels / choice (1)</li> <li>• More viewer interaction possible (1)</li> <li>• Compatible with i-player and catch-up TV (1)</li> <li>• Red button facility (1)</li> </ul> <p style="text-align: right;">(2 X 1)</p>	2
Question Number	Answer	Mark
14.(d)ii	<p>Accept mix &amp; match if appropriate:</p> <ul style="list-style-type: none"> <li>• Its not any obvious race/religion (1) so won't upset anyone (1)</li> <li>• Its neither male nor female (1) so it can be whichever gender people want it to be (1)</li> <li>• Its a caracture/cartoon (1) which will make people smile rather than be offended (1)</li> </ul> <p style="text-align: right;">(1 X 2)</p>	2
Question Number	Answer	Mark
14.(e)	<p>Accept any one of the following:</p> <p>Mass production Mass High volume</p> <p style="text-align: right;">(1 X 1)</p>	1

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