

Mark Scheme (Results) Summer 2008

GCSE

GCSE Design & Technology: Resistant Materials Technology (1973) Paper 2F

1973 2F Mark Scheme

Question Number	Answer	Mark
1 (a)(i)	<p>Name and use the following:</p> <ul style="list-style-type: none"> • Name: Hammer (1) • Use: Putting/hammering/driving in nails/pins / rivets / hitting a centre punch (1) • Name: Tenon/dovetail/back saw/ saw (<i>only answers</i>) • Use: sawing/cutting wood / joints cutting wood / joints (1) (<i>Do not accept sawing</i>) • Name: Hand drill / wheel brace (1) • Use: Drilling/making holes / turning a drill bit (1) (<i>Do not accept only drilling</i>) • Name: Band saw (1) • Use: Cutting materials (1) / cutting plastics (1) / cutting metal (1) / cutting wood (1) • Name: Lathe (1) (<i>accept any phonetic spellings</i>) • Use: Turning round / cylindrical objects / making/shaping wood round (1) <p style="text-align: right;">(10 x 1)</p>	(10)
1 (b)	<p>Two methods named from:</p> <ul style="list-style-type: none"> • Welding (1) • Brazing (1) • Nuts and bolts (1) • Machine screws (1) • Soldering (1) • Self tapping screws (1) • Adhesives / gluing / sticking (1) • Folding/seams (1) <p style="text-align: right;">(2 x 1)</p> <p>(<i>Do not accept any form of riveting</i>)</p>	(2)
1 (c)	<ul style="list-style-type: none"> • PVA (1) • Tensol cement (1) <p>(<i>Only answers</i>)</p> <p style="text-align: right;">(2 x 1)</p>	(2)

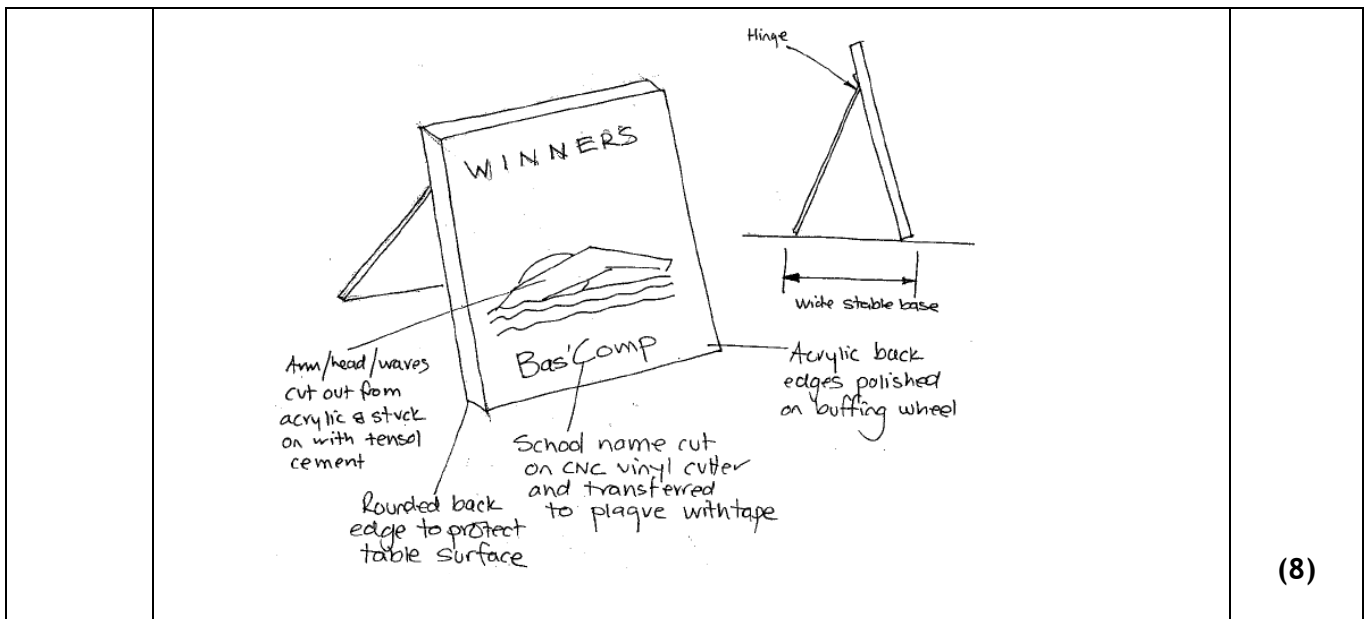
1 (d)	<p>One safety precaution given from:</p> <ul style="list-style-type: none"> • Wear goggles/ avoid splashes in eyes (1) • Use in a well ventilated area (1) • Wear gloves/ avoid contact on skin (1) • Extraction system for fumes/ do not breathe in (1) • Use a face mask (1) <p style="text-align: right;">(1 x 1)</p>	(1)
1 (e)	<p>Two advantages for the manufacturer described from:</p> <ul style="list-style-type: none"> • Easily scanned/ quicker than manual data entry so orders can be processed quickly • Records / sales data / prices checked / stock updated automatically on a central computer • Stock can be easily and quickly located in a warehouse • Will tell you what is in the box without having to open it • Every barcode is unique to product so data can be quickly/easily found/updated for each product • Can be used to determine origin of product without having to look up in records/files <p style="text-align: right;">(4 x 1)</p>	(4)
1 (f) (i)	<p>One method of communication given from:</p> <ul style="list-style-type: none"> • E-mail (1) • Internet / broadband / pod casts / internet chat room / internet messenger (1) • Mobile phone / video phone / PDA / Blackberry / telephone / phone (1) • Faxes (1) • Pagers (1) <p style="text-align: right;">(1 x 1)</p> <p><i>(Do not accept computer)</i></p>	(1)
1 (f) (ii)	<p>One advantage described for the manufacturer from:</p> <ul style="list-style-type: none"> • Faster / quicker / saves times / almost instant than post therefore response time is reduced / reply can be sent back quickly • Cheaper than post which reduces the overall cost • Easier/quicker to place orders so increased sales • Inform the retailer of changes to price / product specification <p style="text-align: right;">(2 x 1)</p>	(2)
Total for question		22

Question Number	Answer	Mark
2 (a)	<ul style="list-style-type: none"> • Stainless steel (1) (Only answer)	(1)
2 (b)(i)	<p>Two properties named from:</p> <ul style="list-style-type: none"> • Hardness / ability to withstand abrasive wear and indentation/scratching (1) • Toughness / ability to withstand sudden shock loading (1) • Durability / ability to withstand weathering deterioration and corrosion (1) • Ductile / ductility ability to be drawn / stretched out (1) • Malleability / ability to be deformed by compression without tearing or cracking (1) • Waterproof / does not absorb water (1) <p style="text-align: right;">(2 x 1)</p> <p><i>(Do not accept strong / rustproof / non-magnetic)</i></p>	(2)
2 (b)(ii)	<p>Two reasons given from:</p> <ul style="list-style-type: none"> • Contaminate food / cause illness to the user (1) • Start to corrode / rust other items it comes into contact with (1) • Will eventually corrode away (1) • Will lose its strength (1) • Aesthetic appearance / will not look as good / pitted surface (1) • Difficult to clean (1) • Possibility of injury / dangerous to use (1) • Fitness for purpose (1) • Consumers would not buy it (1) <p style="text-align: right;">(2 x 1)</p>	(2)
2 (c)	<p>Two properties given from:</p> <ul style="list-style-type: none"> • Hardness / ability to withstand abrasive wear and indentation (1) • Durable / durability / ability to withstand weathering deterioration and corrosion (1) • Tough / toughness / ability to withstand sudden shock loading (1) • Can withstand high temperatures (1) • Waterproof / does not absorb water (1) • Can be made in different colours (1) • Takes a high quality finish (1) • Easily moulded / plasticity / ability to be changed permanently without cracking or breaking (1) • Good heat resistance / insulator (1) <p style="text-align: right;">(2 x 1)</p> <p><i>(Do not accept strong / will not rust)</i></p>	(2)

2 (d)(i)	<p>Two reasons given from:</p> <ul style="list-style-type: none"> • Decoration / makes it look better (1) • Improved / better grip / less likely to slip (1) • Any scratches on the surface will show less (1) <p style="text-align: right;">(2 x 1)</p>	(2)
2 (d)(ii)	<p>One reason explained from:</p> <ul style="list-style-type: none"> • Takes less time because it will be done during moulding / cheaper process. • More accurate / will be less messy which will result in a better product • Less Waste material will be produced which means less to disposed of • Does not require a skilled worker which therefore reduces salary / costs / cheaper costs • All handles identical/more accurate therefore a consistent product. • Better/more consistent finish which means less rejects <p style="text-align: right;">(2 x 1)</p>	(2)
2 (e)(i)	<p>Two advantages given from:</p> <ul style="list-style-type: none"> • Less landfill / volume / space needed for tipping / dumping (1) • Less contaminated / polluted land (1) • Less mining for new materials / destruction of landscape / habitats / environment (1) • Less energy consumption in production of new materials (1) <p style="text-align: right;">(2 x 1)</p>	(2)
2 (e)(ii)	<p>Two reasons given from:</p> <ul style="list-style-type: none"> • Addition to green house gases / global warming • Harm local residents / toxic gases • Pollute rivers/air / kill wildlife / harm wildlife • Protect workers / workforce • Legal requirements / reasonability / COSHH <p style="text-align: right;">(2 x 1)</p>	(2)
2 (f)(i)	<p>Three ways given from:</p> <ul style="list-style-type: none"> • More consistent finish • Cheaper • Identical / consistent products / less likely to have faults/ greater accuracy • In built QC checks result in safer products in the shops • Products more readily available <p style="text-align: right;">(3 x 1)</p> <p><i>(Do not accept quicker / faster / easier)</i></p>	(3)

2(f)(ii)	<p>Two effects explained from:</p> <ul style="list-style-type: none"> • Increased levels of unemployment because skilled manual workers will be made redundant / replaced by computers • Labour freed up to work in service sector • Smaller workforce but more highly skilled / paid • Change in socio-economics of whole area because unemployed people have less money to spend • Reduction of menial tasks / jobs will improve the quality of life for those workers left • Increased mobility of workforce needing to move into new areas of employment / development • Re-training programmes required in order to allow workers to use high-tech machinery <p style="text-align: right;">(4 x 1)</p>	(4)
Total for question		22

Question Number	Answer	Mark
3 (a)	<p>DESIGN IDEA 1 Each point of specification has two marking points.</p> <p>1 mark should be awarded for evidence of each point of specification in the design. For each specification point with both elements viably satisfied 2 marks For each specification point with only one element viably satisfied 1 mark Where the answer does not viably answer a specification point 0 marks</p> <p>Candidates may answer any specification point in either graphical form or by annotation.</p> <p>No marks are awarded for quality of communication.</p> <p>Clearly indicate that the trophy is for the winners of a swimming competition</p> <ul style="list-style-type: none"> • Indication that the trophy is for winners (1) E.g. first, 1st, winners, champions, image, picture • Swimming based theme (1) E.g. image of swimmers, graphic images, swimming icons <p>Provide space for the name of the winning school and allow the name to be fixed to the trophy</p> <ul style="list-style-type: none"> • Provide a space for the name of the winning school (1) E.g. open space for name, small engraved crest • Fixed to the trophy (1) E.g. screws, small pins, adhesives, slide in, slot in name cards <p>Have a base that will not damage the surface it is placed on and that will help to prevent the trophy from falling over</p> <ul style="list-style-type: none"> • Material/ method which will not damage the surface the trophy is placed on (1) E.g. rubber feet, felt base, cork, rounded over edges. barriers • Evidence of a base which will not fall over (stable) (1) E.g. large base area, tripod <p>Be made from materials, using processes suitable for production in a school workshop</p> <ul style="list-style-type: none"> • Evidence of materials used (1) E.g. (Specific materials named, not generic terms) • Evidence that it can be easily made (1) E.g. (Tools / processes / machinery) 	



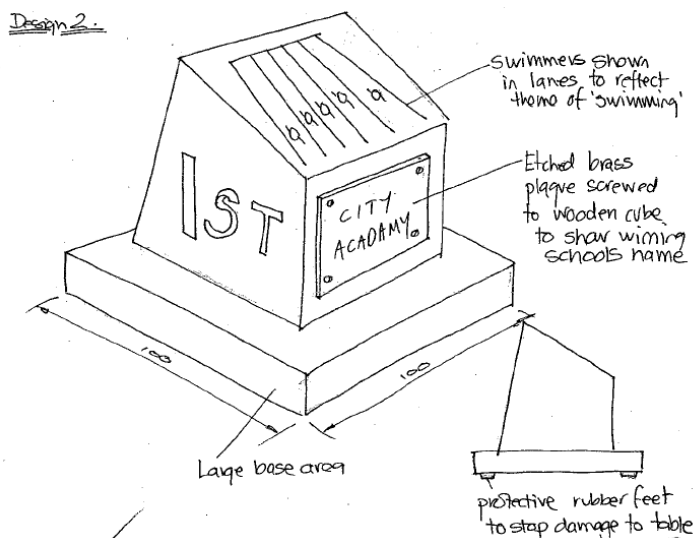
(8)

DESIGN IDEA 2

To score a mark for Design Idea 2, each specification point must be resolved again in the second design idea but the second design idea must be **technically / conceptually different in design and construction** from the first and not a simple variation on a theme to score the mark.

Use exactly the same criteria as design idea 1 to mark design idea 2.

- A different method of identifying the winners (1)
- A different way of reflecting a swimming theme (1)
- A different way of providing a space for the winners name (1)
- A different way of fixing the name to the trophy (1)
- A different way not damaging the table surface (1)
- A different way of creating a base which will not easily fall over (1)
- A different material (1)
- A different manufacturing method (1)



(8)

<p>3 (b)</p>	<p>Each point clearly evaluated.</p> <p>If a candidate has indicated design idea 1 and then evaluates design idea 2 for all or part of (i), (ii) or (iii) then the idea in greater evidence should be marked.</p> <p>The evaluation of the design must contain reference to either positive or negative aspects not just simply a description of the design.</p> <p>Award 1 mark for a correct evaluation / justification relating to each design feature and how it succeeds or fails</p> <p>Repetition of original spec scores 0</p>	
<p>3 (b)(i)</p>	<p>Evaluation of: clearly indicating that the trophy is for the winning school of a swimming competition</p> <p>Positive or negative comments relating to:</p> <ul style="list-style-type: none"> • Clear indication that the trophy is for the winning team (1) • Of a swimming competition (1) <p style="text-align: right;">(2 x 1)</p>	<p>(2)</p>
<p>3 (b)(ii)</p>	<p>Evaluation of: provide space for the name of the winning school and allow the name to be fixed to the trophy</p> <p>Positive or negative comments relating to:</p> <ul style="list-style-type: none"> • How the space for the name of the winning school is provided (1) • How it is fixed to the trophy (1) <p style="text-align: right;">(2 x 1)</p>	<p>(2)</p>
<p>3 (b)(iii)</p>	<p>Evaluation of: a base that will not damage the surface it is placed on and that will help to prevent the trophy from falling over</p> <p>Positive or negative comments relating to:</p> <ul style="list-style-type: none"> • How the trophy will not damage to surface on which it is placed (1) • The stability of the base (1) <p style="text-align: right;">(2 x 1)</p>	<p>(2)</p>
<p>Total for question</p>		<p>22</p>

Question Number	Answer	Mark
4 (a)	<p>(It is essential that the point and reason both fully relate to the market, environment and quality)</p> <p>Note: Original specification points are:</p> <ul style="list-style-type: none"> • Be easy to grip with wet hands • show if the tap will be used for hot or cold water 	
4 (a)(i)	<p>Market</p> <ul style="list-style-type: none"> • Point: Suitable for mass/batch production • Reason: Large demand / every household requires at least 1 set of taps • Point: Must look attractive / stylish / aesthetic / appeal • Reason: To increase sales / attract customers • Point: Easy to fit • Reason: Need for few skills / tools / equipment / DIY installation / reduces costs <p style="text-align: right;">(2 x 1)</p>	(2)
4 (a)(ii)	<p>Environment</p> <ul style="list-style-type: none"> • Point: Can be made from recycled materials • Reason: To reduce the amount of new materials required / conserve virgin materials / reduce impact of mining for new materials • Point: Should be recycled • Reason: To reduce landfill / use materials to make new items / products / protect environment. <p style="text-align: right;">(2 x 1)</p> <p><i>(answers must relate to environmental considerations with respect to where the materials come from)</i></p>	(2)

4 (a)(iii)	<p>Quality</p> <ul style="list-style-type: none"> • Point: Smooth surface finish on tap • Reason: So no one cuts / scrapes their hands / when using the taps • Point: Durability / ability to withstand deterioration and corrosion • Reason: Give long life / reliable performance / last longer / fewer replacements • Point: Can be easily maintained • Reason: Reduces expensive replacement costs • Point: Good fitting of all parts • Reason: So tap operates quickly/will not drip/leak <p><i>(Do not accept any answers relating to quality of materials)</i></p>	(2 x 1) (2)
4 (b)(i)	<p>Two reasons given from:</p> <ul style="list-style-type: none"> • Will not rust / corrode (1) • Casts well (1) • Turns / machines well (1) 	(2 x 1) (2)
4 (b)(ii)	<p>Two reasons given from:</p> <ul style="list-style-type: none"> • More aesthetically pleasing / looks good (1) • Easier to keep clean (1) • Will not tarnish / discolour / oxidise(1) • Can be done on a large scale (1) • Will withstand bathroom cleaning materials (1) • Use a more expensive material to finish the surface with (1) <p><i>(Do not accept smooth/good surface finish/prevents rust)</i></p>	(2 x 1) (2)

4 (c)	<p>Two properties and reasons given from:</p> <ul style="list-style-type: none"> • Property: Waterproof / will not absorb water • Reason: Will not be affected by wet hands / water • Property: Electrical insulator / will not allow electricity to pass through it • Reason: Will not conduct electricity if taps become live. • Property: Durable / hard • Reason: Will withstand the knocks and bumps it will be subjected to in the bathroom / last longer / being twisted • Property: Plasticity/moulds easily • Reason: Can be moulded into complex shapes / high standard of finish / can be mass produced • Property: Good insulator of heat • Reason: Will not get burnt from the hot tap • Property: Wide range of colours available • Reason: Can be coloured to match surroundings/temperature of water • Property: Resistance to cleaning products/household chemicals • Reason: So that the surface will not be damaged/pitted <p style="text-align: right;">(4 x 1)</p>	(4)
4 (d)	<p>Two quality control checks named from:</p> <ul style="list-style-type: none"> • Quality of surface finish (1) • Dimensional accuracy / does it fit (1) • Colour match against control piece (1) • No sharp edges (1) <p style="text-align: right;">(2 x 1)</p>	(2)
4 (e)	<p>One way described from:</p> <ul style="list-style-type: none"> • It is a single piece but a complicated shape which cannot be cut by hand • The grooves/texture could be cut by a milling machine but it would be too expensive and take too long • Several handles can be moulded at the same time which would cut down the unit cost / production time • Tapers one way which makes it easier to mould (release) • Solid sided shape which cannot be formed by vacuum forming. <p style="text-align: right;">(2 x 1)</p>	(2)

4 (f)(i)	<p>One purpose explained:</p> <ul style="list-style-type: none"> • The tap is tapered/ ergonomically shaped which means that you can hold it easier/ fits the shape of the hand better • The grooves provide a texture/increase surface area which makes it easier to get hold of/ to turn with wet hands • Any excess water will run down the tapered grooves and away which stops the handle being wet and slippery to get hold of <p style="text-align: right;">(2 x 1)</p>	(2)
4 (f)(ii)	<p>One purpose explained:</p> <ul style="list-style-type: none"> • The coloured insert ring (red/blue) reflects what the temperature of the water, either hot (red) or cold (blue) <p style="text-align: right;">(2 x 1)</p>	(2)
	Total for question	22
	Total for paper	88