

Mark Scheme (Results) Summer 2008

GCSE

GCSE Design & Technology: Resistant Materials Technology (3973) Paper 2F

3973 2F Mark Scheme

Question Number	Answer	Mark
1 (a)(i)	<p>Name and use the following:</p> <p>Name: Hammer (1) Use: Putting/hammering/driving in nails/pins / rivets / hitting a centre punch (1)</p> <p>Name: Tenon/dovetail/back saw(on its own) (1) <i>(only answers)</i> Use: Sawing/cutting wood / joints cutting wood / joints (1) <i>(Do not accept only sawing)</i></p> <p>Name: Hand drill / wheel brace (1) Use: Drilling/making holes / turning a drill bit (1) <i>(Do not accept only drilling)</i></p> <p style="text-align: right;">(6 x 1)</p>	(6)
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 (1) / gluing (1) / 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;">(2 x 1)</p>	(1)
Total for question		11

Question Number	Answer	Mark
2 (a)	<ul style="list-style-type: none"> • Stainless steel (1) (Only answer) <p style="text-align: right;">(2 x 1)</p>	(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><i>(Do not accept strong / rustproof / non-magnetic)</i></p> <p style="text-align: right;">(2 x 1)</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><i>(Do not accept strong / will not rust)</i></p> <p style="text-align: right;">(2 x 1)</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 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)
Total for question		11

Question Number	Answer	Mark
3 (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 	
3 (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)
3 (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><i>(answers must relate to environmental considerations with respect to where the materials come from)</i></p> <p style="text-align: right;">(2 x 1)</p>	(2)

<p>3 (a)(iii)</p>	<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>	<p>(2 x 1) (2)</p>
<p>3 (b)(i)</p>	<p>Two reasons given from:</p> <ul style="list-style-type: none"> • Will not rust / corrode (1) • Casts well (1) • Turns / machines well (1) 	<p>(2 x 1) (2)</p>
<p>3 (b)(ii)</p>	<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>	<p>(2 x 1) (2)</p>

3 (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;">(2 x 1) (2 x 1)</p>	(4)
3 (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)
3 (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)

3 (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)
3 (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	44