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Mark Scheme (Results)
Summer 2008

GCSE

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

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3973 2H Mark Scheme

Question Number	Answer	Mark
1 (a)	(It is essential that the point and reason both fully relate to the market, environment and quality) **Note: Original specification points are:** • Be easy to grip with wet hands • show if the tap will be used for hot or cold water	
1 (a)(i)	**Market** • **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 (2 x 1)	**(2)**
1 (a)(ii)	**Environment** • **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. *(answers must relate to environmental considerations with respect to where the materials come from)* (2 x 1)	**(2)**

1 (a)(iii)	Quality • **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 *(Do not accept any answers relating to quality of materials)* (2 x 1)	**(2)**
1 (b)(i)	**Two** reasons given from: • Will not rust / corrode (1) • Casts well (1) • Turns / machines well (1) (2 x 1)	**(2)**
1 (b)(ii)	**Two** reasons given from: • 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) *(Do not accept smooth/good surface finish/prevents rust)* (2 x 1)	**(2)**

1 (c)	**Two** properties and reasons given from: • **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 (2 x 1) (2 x 1)	**(4)**
1 (d)	**Two** quality control checks named from: • Quality of surface finish (1) • Dimensional accuracy / does it fit (1) • Colour match against control piece (1) • No sharp edges (1) (2 x 1)	**(2)**

1 (e)	**One** way described from: • 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.** (2 x 1)	**(2)**
1 (f)(i)	**One** purpose explained: • 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** (2 x 1)	**(2)**
1 (f)(ii)	**One** purpose explained: • The **coloured insert ring (red/blue)** reflects what the temperature of **the water, either hot (red) or cold (blue)** (2 x 1)	**(2)**
	Total for question	**22**

Question Number	Answer	Mark
2 (a)	• Copper (1) • Zinc (1) *(Only answers)* (2 x 1)	**(2)**
2 (b)	1. Mortice (1) and tenon (1) 2. Dowel / peg (1) 3. Housing (1) *(Only answers)* (2 x 1)	**(4)**
2 (c)(i)	**Three** risks given from: • Splashes in eyes / on skin / irritant (1) • Fumes / inhalation / toxicity (1) • Fire / flammability (1) • Danger of spilling / slipping (1) • Use of solvents / cleaning of brushes (1) (2 x 1)	**(3)**
2 (c)(ii)	**One** reason explained from: • **More durable** therefore will **last longer** • **More durable** because the **surface will be protected / improve resistance to moisture** • A **higher quality product** will therefore **increase the sales / reputation of the company** • **Appearance is enhanced** which is likely to **make the product more appealing** • **Safer to handle** because the **surface will be smoother** • The **nature of the varnished surface** will **allow the steps to be wiped and kept clean** • **Wood grain / splits / splinters** can be **easily seen** • **Protect the wood/surface** which means will **resist moisture/dirt** (2 x 1)	**(2)**
	Total for question	**11**

Question Number	Answer	Mark
3 (a)	**Three** properties given from: • Hard / ability to withstand indentation / abrasion • Tough / ability to withstand knocks and bumps / wear and tear • Durable / good weather/moisture resistance • Dense / close grained / close structure (Do *not* accept hardwood) (3 x 1)	**(3)**
3 (b)	**One** explanation from: • Chipboard **absorbs water easily / is not durable** and will therefore **quickly swell / break down / degrade.** • Chipboard **breaks / bends easily** because it is **made from small chips of wood / has no grain** (2 x 1)	**(2)**
3 (c)	**One** explanation from: • It will **last longer in the ground** because **wood will rot away / more quickly than steel will rust away** • **Steel is more stable than wood** and therefore **the compost bin will retain its shape / not fall apart** • **Wood will warp / twist** and therefore the **compost bin may lose its shape / fall apart** • **Can be driven into the ground easier than oak** as it **does not break / split / splinter** (2 x 1)	**(2)**

3 (d)	**Two** properties given and reasons from: • **Property**: Plasticity / easily moulded • **Reason**: easily injected / squeezed into the mould for manufacture • **Property**: Durable • **Reason**: It will not decay / deteriorate when left outside / last a long time • **Property**: Waterproof • **Reason**: Will not absorb water and rot • **Property**: Tough • **Reason**: Will withstand the knocks and bumps in the garden • **Property**: can be coloured • **Reason**: so that it fits in more naturally with the environment • **Property**: Flexibility • **Reason**: So that the lid and access panel can be snapped in to position • **Property**: Lightweight • **Reason**: So that it is easy to move / lift the lid (2 x 1) (2 x 1)	**(4)**
	Total for question	**11**
	Total for paper	**44**