

Design and Technology

General Certificate of Secondary Education **1959/04**

Industrial Technology Paper 4

Mark Scheme for June 2010

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Question			Expected Answer	Mark	Rationale/Additional Guidance
1	(a)	(i)	Stainless steel; Brass; Aluminium alloy (1)		accept copper
	(a)	(ii)	Presswork; Stamping/punching (1)		
	(a)	(iii)	Keeps body firm / holds body sides in; Stops body sides scratching surface (table); Rack is easier to carry; Catches crumbs off toast. (2 x 1)		Not stability unless referring to stiffening the body
	(b)	(i)	Design can be done anywhere; Easy to make changes/edit to design; Importing designs/details from elsewhere; Can show 3D modelling; Can send designs electronically; Can save designs without needing paper. (3 x 1)		NOT quicker; easier; more accurate No mark for reference to CAM
	(b)	(ii)	CNC router / milling machine / machining centre / laser cutter/ HP water jet (1)		Accept if CNC not specifically referenced
	(b)	(iii)	Less labour needed to operate machines; All parts are identical/accurate; Good for batch production; Easy to set up machines. (2 x 1)	[10]	Reference to speed of production not accepted
2	(a)		Plastic is easy to form into shape; Insulator for electronics; Easy to clean; Can be made in any colour / self coloured; Light and safe to handle. (2 x 1)		No simplistic one word answers

Question			Expected Answer	Mark	Rationale/Additional Guidance
	(b)		Description to include shape and size to fit hand / positioning of buttons to make them easy to reach and use. Feature (1) Description (1) (1 + 1)		Two features equals two marks
	(c)	(i)	1. Hopper 2. Heater 3. Feed screw / ram (3x1)		
	(c)	(ii)	Explanation to include reference to feed screw taking plastic granules through heating chamber to melt plastic(1) and injection by ram into mould.(1) (1+1)		Must have reference to heating for any marks
	(d)		Vacuum forming; extrusion; blow moulding; rotational moulding; compression moulding; press moulding. (1)	[10]	Allow line bending
3	(a)		Lightweight but relatively strong; more corrosion resistant than steel; easy to form to shape; can be coloured by anodising (2 x 1)		No simplistic one word answers
	(b)		Knurling (1)		
	(c)		Forging; Extrusion; Pressing / Stamping (2 x 1)		Allow rolling
	(d)		One mark for each specification point: Vertical; easily fitted and removed; unable to work loose (3 x 1) Clear communication of a suitable method of assembly with details of construction and components (2)	[10]	
4	(a)	(i)	sand casting; lost wax (investment) casting; shell moulding (1)		
	(a)	(ii)	Aluminium alloy; brass; bronze (1)		
4	(b)		Annotated sketch of a suitable fixing method (1) that prevents damage to the plastic lens frame(1) (1 + 1)		

Question			Expected Answer	Mark	Rationale/Additional Guidance
	(c)		Two marks for each specification point clearly communicated: Prevent turning; lockable at required height; fine adjustment (3x2)	[10]	
5	(a)	(i)	Explanation to include: reference to component manufacturers / suppliers (1); delivery of the required amount to the factory/assembly line at the time it is needed (1); manufacturer needs less storage space (1) (3)		
	(a)	(ii)	Manufacturer relies heavily on other firms; suppliers problems can cause production to stop; transport problems can cause production to stop; delivery of component parts adds to traffic congestion. Disadvantage(1); Description(1) (2)		
	(a)	(iii)	Cell production; concurrent engineering; in-line assembly (1)		Allow reference to logistics
	(b)		Less raw materials being used up; less pollution from extraction and processing; reduced energy usage; less waste to landfill; less transportation of raw materials around world. Benefit (1); Description (1) (2 x 2)	[10]	
			Total	[50]	

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