OCR
RECOGNISING ACHIEVEMENT

GCSE

Design & Technology (Industrial Technology

General Certificate of Secondary Education **GCSE 1959**

Mark Schemes for the Components

June 2006

1959/MS/R/06

Oxford Cambridge and RSA Examinations

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All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes should be read in conjunction with the published question papers and the Report on the Examination.

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General Certificate of Secondary Education

Design and Technology: Industrial Technology (1959)

MARK SCHEMES FOR THE COMPONENTS

Mark Scheme 1959/01
June 2006

1	**(a)**	Angle Square tube Round rods Channel Hexagonal rods Strips		(6 x 1)	**[6]**
	(b)	4 jaw 3 jaw 4 jaw 3 jaw		4 x 1	**[4]**
				sub	**[10]**
2	**(a)**	C B A D		4 x 1	**[4]**
	(b)	Hexagonal Round rod Round tube		3 x 1	**[3]**
	(c)	Wear ear defenders Wear goggles		1 1	**[2]**
	(d)	Blue		1	**[1]**
				sub	**[10]**
3	**(a)**	Extrusion/rolled and seam welded		1	**[1]**
	(b)	Will it work, Will it come apart for maintenance, Notes to include materials and processes		1 1 2	**[4]**
	(c)	Lock nuts		1	**[1]**
	(d)	Location point,/clamping Can shape both ends Held in vice		1 2 1	**[4]**
				sub	**[10]**
4	**(a)**	Symbol for Parallel turning Centre drilling Drilling to depth Knurling Taper turning Parting off	= F = E = B = G = D = C	6 x 1	**[6]**
	(b)	A = metric thread B = diameter C = length D = hexagonal bolt		4 x 1	**[4]**
				sub	**[10]**

5	**(a)**	**(i)**	Injection moulding	1	**[2]**	
		(ii)	Fabricating/rolled and welded	1		
	(b)		Bucket A	1	**[1]**	
	(c)		Galvanising/powder coating/electro plating	1	**[1]**	
	(d)		Reinforcing/extra strength support	1	**[1]**	
	(e)	**(i)**	Part of the moulding process	1		
		(ii)	Pressed/stamped	1	**[2]**	
	(f)		Change relative sizes of height and diameter to Make more stable	1		
			Mould webs to strengthen sides of bucket	1		
			Mould lip into top edge	1	**[3]**	
					sub	**[10]**

Mark Scheme 1959/02
June 2006

1	**(a)**		Symbol for:			
			parallel turning	= F		
			centre drilling	= E		
			drilling to depth	= B		
			knurling	= G		
			taper turning	= D		
			parting off	= C	6 x 1	**[6]**
	(b)		A = metric thread			
			B = diameter			
			C = length			
			D = hexagonal bolt		4 x 1	**[4]**
						sub **[10]**
2	**(a)**	**(i)**	Injection moulding		1	
		(ii)	Fabricating		1	**[2]**
	(b)		Bucket A		1	**[1]**
	(c)		Galvanising/powder coating/electro plating		1	**[1]**
	(d)		Reinforcing		1	**[1]**
	(e)	**(i)**	part of the moulding process		1	
		(ii)	pressed/stamped		1	**[2]**
	(f)		change relative sizes of height and diameter to make more stable		1	
			mould webs to strengthen sides of bucket		1	
			mould lip into top edge		1	**[3]**
						sub **[10]**
3	**(a)**		A = Oscillating		1	
			B = Rotary		1	
			C = Reciprocating		1	**[3]**
	(b)	**(i)**	Worm and Wheel		1	
		(ii)	Very low gearing, can act as a brake, turn operation through right angle, change in direction of motion		1	**[2]**
	(c)		locate material		1	
			can demonstrate two bends		2	
			can be held in an engineers' vice		1	
			Additional notes could include materials,			**[5]**
			fastenings, operations		1	**sub** **[10]**

4	**(a)**	Will it work	1		
		adjustable without the aid of tools	1		
		secure locking mechanism	1		
		supporting notes demonstrating knowledge of suitable components and materials	2	**[5]**	
	(b)	Will it work	1		
		Recognised method	1		
		Secure locking method	1		
		Clearance hole	1	**[5]**	
		Extra detail e.g. fastenings/ fittings Named	1	**sub**	**[10]**
5	**(a)**	ISO = International Standards Organisation.	1		
		Sets out standards specific to	1		
		the organisation and management	1		
				[3]	
	(b)	Companies that demonstrate quality standards throughout the whole organisation but particularly in design and manufacture. Every person in the organisation is responsible for quality. (Quality assurance as opposed to quality control, leading to total quality management).		**[2]**	
	(c)	Encourages flexibility in the workforce within the cell. Shared responsibility encouraging better morale. Implications for quality control - easier to identify the source of any problems in production quality. It can be easier to identify maintenance periods without stopping the whole production line. It will often be less expensive to make changes to production and design without disruption to the whole process.	(5 x 1)	**[5]**	
				sub	**[10]**

Mark Scheme 1959/03
June 2006

1	**(a)**	**(i)**	Hygienic, easy to shape/mould, bright colours of materials easy to clean, easy to mass-produce, light for child to pick up, safe for child to use.	(any 3 x 1 mark)	**[3]**
		(ii)	Any accurately named plastic such as PVC, HIP, ABS, Nylon, Acrylic, PETE, etc		**[1]**
	(b)		Suitable drawing of each plastic component Electric plug - Insulation Packing of batteries – See through, keep secure	(3 x 1 mark)	**[3]**
			Kitchen knife – (Handle) – Good grip, easy to clean, more comfortable to use, non conductor of heat	(3 x 1 mark)	**[3]**
2	**(a)**	**(i)**	Contains no iron		**[1]**
		(ii)	Any two suitable ferrous metals (Iron, steel, stainless steel, etc)	(2 x 1 mark)	**[2]**
	(b)		Difficult to mine, difficult to refine, rare.	(any 1 x 1 mark)	**[1]**
	(c)		Expandable, easy to maintain, adjustable, easy to clean, attractive to look at, no sharp corners or edges.	(up to 4 marks)	**[4]**
	(d)		Quality finish, unique product, unique application	(any 2 x 1 mark)	**[2]**
3	**(a)**		Design that shows: Hand operation, accurate size and shaping capability, safe to use, easy use and maintain, workbench mounted (Add 1 mark for clear communication of ideas)	(1 mark for each point to max of 6)	**[6]**
	(b)		Design that can locate the component securely (1) and position the holes accurately (1) for safe use (1) and is clearly communicated (1)	(4 x 1 mark)	**[4]**
4	**(a)**	**(i)**	Accurate, able to get great detail, speed of production	(any 2 x 1 mark)	**[2]**
		(ii)	Lathe, milling machine, laser cutter, drilling machine, or suitable	(2 x 1mark)	**[2]**
	(b)		Visual, sizes, material quality, random sampling	(2 x 1 mark)	**[2]**
	(c)		Cost of equipment (1) and the effect of this on profit margins (1) Compatibility of existing (computer) systems (1) + effect (1) Effect on the labour force (1), training of staff (1) and the social implications (1) (Accept references to physical installation) (any 2 x 2 marks)		**[4]**

5 **(a)** Change to the profile of the knife including rib or ribs(1)
Minimal extra material/production cost (1)
Good quality communication (1) **[3]**

(b) Cup A – Handle inefficient **[1]**
Cup B – Base (cup will not stand up) **[1]**
Cup C – Smooth sides no grip or structure/no draft angle for stacking **[1]**

(c) Showing changed profile, added lip, grip (1)
Justified annotation (1) (any 2 x 1 mark) **[2]**

(d) Litter (1) will contradict the company's reputation (1). **[2]**

Total [50]

Mark Scheme 1959/04
June 2006

1 **(a)** **(i)** Accurate, able to get great detail, speed of production
(any 2 x 1 mark) **[2]**

(ii) Lathe, milling machine, laser cutter, drilling machine, or suitable (2 x 1mark) **[2]**

(b) Visual, sizes, material quality, random sampling (2 x 1 mark) **[2]**

(c) Cost of equipment (1) and the effect of this on profit margins (1)
Compatibility of existing (computer) systems (1) + effect (1)
Effect on the labour force (1), training of staff (1) and the social implications (1)
(Accept reference to physical installation)
(any 2 x 2 marks) **[4]**

2 **(a)** Change to the profile of the knife including rib or ribs(1)
Minimal extra material/production cost (1)
Good quality communication (1) **[3]**

(b) Cup A – Handle inefficient **[1]**
Cup B – Base (cup will not stand up) **[1]**
Cup C – Smooth sides no grip or structure/no draft angle for stacking **[1]**

(c) Showing changed profile, added lip, grip (any 2 x 1 mark) **[2]**

(d) Litter (1) will contradict the company's reputation (1). **[2]**

3 **(a)** Jig showing: Easy secure location of material
Cutting of material of length
Bending of material
Good quality communication (4 x 1 mark) **[4]**

(b) Cleaning the joint; securing the joint; applying flux; checking air gas mixture; selecting brazing rod (any 3 x 1 mark) **[3]**

(c) Cleaning of surfaces
Application of heat to metal
Dipping into plastic granules/application of plastic
Removal and setting process (3 x 1 mark) **[3]**

4 **(a)** Handle allows grip
Blade held securely
Two halves securely fixed
Retractable/removable blade/blade safety (any 2 x 1 mark) **[2]**

(b) Description of the die casting process
2-part metal mould; clamped mould halves; molten metal poured
(3 points x 1 mark) **[3]**

(c) Design shows: that two-part can be securely held (1) safe to use (1)
allows blades to be changed easily (1) practical quick release design (1) ideas clearly communicated (1) **[5]**

5 **(a)** Cost effective to mass produce. Speed of production process. Ease of producing complex shape. (2 x 1 mark) **[2]**

(b) Tooling may be damaged
Inefficient feed of plastics material
Incorrect injection temperature
Incorrect mould temperature (any 3 x 1 mark) **[3]**

(c) Speed of production, accuracy and consistency of each product
Quality of finish (2 points x 1 mark) **[2]**

(d) They may have a unique bespoke purpose. Very few may be required.
It may be more cost effective. Quality product. (3 points x 1 mark) **[3]**

TOTAL: 50

General Certificate of Secondary Education
Industrial Technology (1959)
June 2006 Assessment Series

Component Threshold Marks

Component		Maximum Mark	a*	a	b	c	d	e	f	g	u
01	Raw	50	-	-	-	27	24	21	19	17	0
	Weighted	35	-	-	-	18.9	16.8	14.7	13.3	11.9	0
02	Raw	50	-	23	19	15	11	-	-	-	0
	Weighted	35	-	16.1	13.3	10.5	7.7	-	-	-	0
03	Raw	50	-	-	-	26	23	20	17	14	0
	Weighted	35	-			18.2	16.1	14	11.9	9.8	0
04	Raw	50	-	27	22	18	13	-	-	-	0
	Weighted	35	-	18.9	15.4	12.6	9.1	-	-	-	0
05	Raw	105	-	79	68	57	46	35	24	11	0
	Weighted	105	-	79	68	57	46	35	24	11	0

Specification Aggregation Results

Overall threshold marks (i.e. after conversion of raw marks to weighted marks)

	Maximum Mark	A*	A	B	C	D	E	F	G	U
Foundation	175	-	-	-	92	77	63	49	35	0

	Maximum Mark	A*	A	B	C	D	E	F	G	U
Higher	175	128	112	96	80	63	54	-	-	0

The cumulative percentage of candidates awarded each grade was as follows:

	A*	A	B	C	D	E	F	G	U	Total No. of Cands
F'ndation	-	-	-	24.38	47.24	66.29	84.19	93.33	100	525
Higher	6.34	26.67	51.38	76.26	93.01	95.94	-	-	100	615

1140 candidates were entered for certification this series

For a description of how UMS marks are calculated see;
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