

Design & Technology (Industrial Technology)

General Certificate of Secondary Education **GCSE 1959**

Mark Schemes for the Components

June 2008

1959/MS/R/08

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General Certificate of Secondary Education Electronic Products (1959)

MARK SCHEMES FOR THE COMPONENTS

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1959/01 Paper 1 (Foundation)

- 1 (a) A
C
E
D
F (1x5) [5]
- (b) centre drill
three jaw chuck
revolving centre
parting tool
knurling tool (1x5) [5]
[10]
- 2 (a) number off = 4
1800 x dia 40
bracket
polypropylene (1x5) [5]
- (b) (i) Stainless steel (1)
- (ii) Will not corrode (1) [2]
- (c) A Metric (1)
B Diameter (1)
C Length (1) [3]
[10]
- 3 (a) Answer can include whole process ie marking out, shaping curved end, drilling and bending. Answer could describe one of these in detail, identifying stages and/or tools. (1x3) [3]
- (b) Will it work, locate parts, suitable material identified, parts should not be brazed to jig, easy to remove from jig. (1x5) [5]
- (c) (i) Countersunk (1)
- (ii) Round head (1) [2]
[10]

- | | | | | |
|----------|------------|---|------------|-------------|
| 4 | (a) | Eg light weight, wipe clean, stacking, resistant to the weather, no surface treatment required, suitable for mass manufacture, A is cheaper than B to produce | (1x2) | [2] |
| | (b) | Injection moulding. | (1) | [1] |
| | (c) | Drawings to show webs moulded in the design (extra plastic 1 mark only , eg addition of arms) modified feet. | (2)
(2) | [4] |
| | (d) | Powder coating, anodising. | (1) | [1] |
| | (e) | Draft angle, smooth surface, rounded edges. | (1x2) | [2] |
| | | | | [10] |
| 5 | (a) | Answers linked to: safety, ergonomics, bright colours, weather proof, aesthetics, quality of finish or suitable other. | (1x3) | [3] |
| | (b) | Easy to modify, can be sent to a manufacturer any where in the world within seconds, less storage space required than paper. | (1x2) | [2] |
| | (c) | Will it work | (1) | |
| | | Can the design be easily assembled/disassembled | (1) | |
| | | will the structure remain safe | (1) | |
| | | will the structure remain rigid | (1) | |
| | | technical notes. | (1) | [5] |
| | | | | [10] |

1959/02 Paper 2 (Higher)

- | | | | | |
|---|-----|--|---------------------------------|------|
| 1 | (a) | Eg light weight, wipe clean, stacking, resistant to the weather, no surface treatment required, suitable for mass manufacture. A is cheaper than B to produce. | (1x2) | [2] |
| | (b) | Injection moulding. | (1) | [1] |
| | (c) | Drawings to show webs moulded in the design (extra plastic 1 mark only, eg addition of arms) modified feet. | (2)
(2) | [4] |
| | (d) | Powder coating, anodising. | (1) | [1] |
| | (e) | Draft angle, smooth surface, rounded edges. | (1x2) | [2] |
| | | | | [10] |
| 2 | (a) | Answers linked to: safety, ergonomics, bright colours, weather proof, aesthetics, quality of finish, or suitable other. | (1x3) | [3] |
| | (b) | Easy to modify, can be sent to a manufacturer any where in the world within seconds, less storage space required than paper. | (1x2) | [2] |
| | (c) | Will it work
Can the design be easily assembled/disassembled
will the structure remain safe
will the structure remain rigid
technical notes. | (1)
(1)
(1)
(1)
(1) | [5] |
| | | | | [10] |
| 3 | (a) | Extrusion | (1) | [1] |
| | (b) | Nylon, polypropylene, PTFE, HD polythene | (1) | [1] |
| | (c) | Answer could include ; draft angle, two part mould, sprue, polished surface, injection point, extractor pins, rapid cooling of mould. | (1x3) | [3] |
| | (d) | Will it work
no holes to be drilled in the roof support beam
hold netting track securely in place
be adjustable
details of components/materials/processes. | (1)
(1)
(1)
(1)
(1) | [5] |
| | | | | [10] |

4	(a)	(i) Worm and wheel	(1)	[1]
		(ii) Turn motion through a right angle, high gearing, acts as a break.	(1x2)	[2]
	(b)	Sleeve held in place, notes to include materials/components. Or other suitable design	(1x3)	[3]
	(c)	(i) Components held together by friction or suitable other.	(2)	[2]
		(ii) Answer to include reference to tolerance and size.	(1x2)	[2]
				[10]
5	(a)	Material manufactured from two or more metals.	(1)	[1]
	(b)	Change the melting point, reduce the weight change resistance to corrosion and oxidation change the machining characteristics increase strength, ductility, hardness, durability. change the colour improve the fluidity for casting change electrical/thermal conductivity. Change aesthetic properties	(1x3)	[3]
	(c)	BS = British standards	(1)	
		The product has been designed and manufactured to meet exacting standards. The standards for the plug are identified by the number.	(1)	[2]
	(d)	The amount of waste, the greater time per unit production, cost of skilled labour.	(1)	[1]
	(e)	Forging	(1)	[1]
	(f)	Materials, labour, energy costs.	(1x2)	[2]
				[10]

1959/03 Paper 3 (Foundation)

Q		Syllabus Ref	Expected Answer	Mark	Rationale												
1	(a)		(Steel) Rule Scribe(r) Try-Square/Engineers Square Dividers Odd legend/Jenny/Hermaphrodite Calipers Scribing Block/Surface Gauge	[6x1]	Accept "Ruler"												
	(b)		Stop drill "skidding"; help start cutting; position hole accurately.	[1]	"Prevent drill blunting" acceptable												
	(c)		Use of layout/marketing fluid; broad felt marker; dot punch outline.	[2]	Accept "felt marker"												
	(d)		Template.	[1]													
				Total [10]													
2	(a)		<table border="1"> <thead> <tr> <th>Tool Used</th> <th>Process</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> </tr> <tr> <td></td> <td>Knurling tool</td> </tr> <tr> <td>Diagram of Knife tool (shape important)</td> <td>Turning down to size/reducing</td> </tr> <tr> <td>Diagram of Die or Screwcutting tool</td> <td></td> </tr> <tr> <td>Diagram of Parting tool (shape important)</td> <td>Parting off</td> </tr> </tbody> </table>	Tool Used	Process				Knurling tool	Diagram of Knife tool (shape important)	Turning down to size/reducing	Diagram of Die or Screwcutting tool		Diagram of Parting tool (shape important)	Parting off	[6x1]	
Tool Used	Process																
	Knurling tool																
Diagram of Knife tool (shape important)	Turning down to size/reducing																
Diagram of Die or Screwcutting tool																	
Diagram of Parting tool (shape important)	Parting off																
	(b)		Simple sketch to show: larger head diameter; coarser knurl; tommy bar hole; "wing";														

Q		Syllabus Ref	Expected Answer	Mark	Rationale
			hex head; s'driver slot. Suitable annotation.	[1] [1]	
	(c)		Use of guard; goggles; remove chuck key; secure work; leave machine to stop; secure cutting tool; tie back hair; cover loose clothing; one person at machine.	[2x1]	
				Total [10]	
3	(a)		Folding bars/vice extensions/angle iron/etc and mallet. Accept clear sketch of bench folding m/c. Suitable annotation.	[2] [1]	Simple use of vice 1 mark max.
	(b)		Thread size; length; head; material; quantity; type of nut and bolt.	[3x1]	Size must be qualified eg. Thread diameter, length of bolt ; etc.
	(c)		Sketch to show suitable means of strengthening (bracing; support brackets; corner fillet). Annotation. Sketch to show slots / larger holes for files. Annotation.	[1] [1] [1] [1]	Annotation required to support designs.
				Total [10]	
4	(a)		Quick and easy to produce designs; ease of making changes; ability to import details; use of animation/rotation/3D views; ability to send electronically.	[3x1]	Benefits to the "designer" only. Mention of CAM not acceptable in this part of question.
	(b)		Computer hard drive; CD; DVD; Floppy; (USB)Memory stick; Server	[3x1]	Not just "USB device " Not just "internet/Website"
	(c)		Fewer skilled workers needed; more consistent outcomes; faster production; lower manufacturing costs	[2x1]	

Q	Syllabus Ref	Expected Answer	Mark	Rationale
	(d)	Use of robotics; quality control procedures; stock control procedures; collection/delivery of parts; use in JIT; control of machines.	[2x1]	
			Total [10]	
5	(a)	Die Casting	[1]	No other response
	(b)	No mains electricity needed Safer to use More comfortable to hold/use Can stand up when not in use (on battery) Keyless chuck.	[3x1]	NOT "lighter"
	(c)	Shape of handle to fit hands; positioning of switch; weight distribution (balance). State (1) Description (1)	[2]	
	(d)	Not biodegradable; use of non-renewable resources; air pollution from processing; energy used in manufacture; ease of post-use dismantling; dangers of plastic waste. Each point – Effect(1) Explanation (1)	[2x2]	
			Total [10]	

Total for paper: [50]

1959/04 Paper 4 (Higher)

Q		Syllabus Ref	Expected Answer	Mark	Rationale
1	(a)		Quick and easy to produce designs; ease of making changes; ability to import details; use of animation/rotation/3D views; ability to send electronically.	[3x1]	Benefits to “designer” only; mention of CAM not acceptable in this part of question
	(b)		Computer hard drive; CD; DVD; Floppy;(USB) Memory stick; Server	[3x1]	Not just “USB device” Not just “Internet/Website”
	(c)		Fewer skilled workers needed; more consistent outcomes; faster production; lower manufacturing costs.	[2x1]	
	(d)		Use of robotics; quality control procedures; stock control procedures; collection/delivery of parts; use in JIT; control of machines	[2x1]	
				Total [10]	
2	(a)		Die Casting	[1]	No other response
	(b)		No mains electricity needed Safer to use More comfortable to hold/use Can stand up when not in use (on battery) Keyless chuck.	[3x1]	NOT “lighter”
	(c)		Shape of handle to fit hands; positioning of switch; weight distribution (balance). State (1) Description (1)	[2]	
	(d)		Not biodegradable; use of non-renewable resources; air pollution from processing; energy used in manufacture; ease of post-use dismantling; dangers of plastic waste Each point – Effect (1) Explanation (1)	[2x2]	
				Total [10]	

Q		Syllabus Ref	Expected Answer	Mark	Rationale
3	(a) (i)		Suitable THERMOPLASTIC eg HIPS; ABS; PETE; PVC	[1]	NOT Perspex / Acrylic
	(ii)		Easy to form shape; speed production; uses little material; ideal for thin sections; consistency of outcome	[2x1]	Not "quick, cheap; easy" - unless qualified.
	(ii)		Extrusion; Injection Moulding; Line Bending; Blow Moulding; Compression Moulding; Rotational Moulding; GRP lay-up; Resin Casting	[2x1]	
	(b)		Annotated sketch (1) to show application of draft angles (1) and rounded corners (1).	[max 3]	
	(c)		Annotated sketch (1) showing simple modification (1) eg Corner relief; thumb indents.	[2]	
				Total [10]	
4	(a)		Annotated (1) sketch to show fixing method (1). Rivets; nuts and bolts; spot (resistance) weld; braze; self-tapping screws Method 1 as above Method 2 as above	[1+1] [1+1]	
	(b)		Description of process involving drilling (1) and reaming or boring (1).	[2]	
	(c)		Annotated sketch(es) to show: Ease of turning (1) (poss use of washer/bearing) Suitable means of locking pin (1) Quality of solution (1) (eg safe and easy to use) Quality of communication (1).	[4]	
				Total [10]	

Q		Syllabus Ref	Expected Answer	Mark	Rationale
5	(a)		Explanation to include reference to: speed of production; cost effectiveness; best use of machines; requirements of JIT.	[3]	
	(b) (i)		Machines/work stations grouped together; one or small team of operators; normally one product or component part.	[2]	
	(ii)		Flow line principle; additions to product at stages; one worker-one operation.	[2]	
	(c)		Explanation to include reference to: provision/storage/movement of materials/parts required for production. Ref to JIT.	[3]	General Reference to "organisation" for (1)
				Total [10]	

					Total for Paper: [50]
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Grade Thresholds

General Certificate of Secondary Education
GCSE D&T Industrial Technology (Specification Code 1959)
June 2008 Examination Series

Component Threshold Marks

Component	Max Mark	A	B	C	D	E	F	G
1	50	-	-	27	23	20	17	15
2	50	26	21	17	12	-	-	-
3	50	-	-	25	21	17	13	10
4	50	30	25	20	14	-	-	-
5	105	81	70	59	47	36	25	14

Specification Options

Foundation Tier

	Max Mark	A*	A	B	C	D	E	F	G
Overall Threshold Marks	175	-	-	-	89	74	60	46	32
Percentage in Grade		-	-	-	17.83	21.93	20.24	15.18	13.25
Cumulative Percentage in Grade		-	-	-	17.83	39.76	60	75.18	88.43

The total entry for the examination was 443

Higher Tier

	Max Mark	A*	A	B	C	D	E	F	G
Overall Threshold Marks	175	132	116	100	85	65	55	-	-
Percentage in Grade		6.1	20.89	31.46	21.36	14.09	3.05	-	-
Cumulative Percentage in Grade		6.1	27	58.45	79.81	93.9	96.95	-	-

The total entry for the examination was 440

Overall

	A*	A	B	C	D	E	F	G
Percentage in Grade	3.09	10.58	15.93	19.62	17.95	11.53	7.49	6.54
Cumulative Percentage in Grade	3.09	13.67	29.61	49.23	67.18	78.72	86.21	92.75

The total entry for the examination was 883

Statistics are correct at the time of publication.

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