

# **Design & Technology (Industrial Technology)**

General Certificate of Secondary Education **GCSE 1959**

## **Mark Schemes for the Components**

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**June 2007**

**1959/MS/R/07**

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The mark schemes are published as an aid to teachers and students, to indicate the requirements of the examination. It shows the basis on which marks were awarded by Examiners. It does not indicate the details of the discussions which took place at an Examiners' meeting before marking commenced.

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.

The reports on the Examinations provide information on the performance of candidates which it is hoped will be useful to teachers in their preparation of candidates for future examinations. It is intended to be constructive and informative and to promote better understanding of the syllabus content, of the operation of the scheme of assessment and of the application of assessment criteria.

Mark schemes and Reports should be read in conjunction with the published question papers.

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### General Certificate of Secondary Education Electronic Products (1959)

#### MARK SCHEMES FOR THE UNITS

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**Mark Scheme 1959/01**  
**June 2007**

## INSTRUCTIONS ON MARKING SCRIPTS

*All page references relate to the Instructions to Examiner booklet (revised June 2006)*

For many question papers there will also be subject or paper specific instructions which supplement these general instructions. The paper specific instructions follow these generic ones.

### 1 Before the Standardisation Meeting

**Before the Standardisation Meeting you must mark a selection of at least 10 scripts.** The selection should be drawn from several Centres. The preliminary marking should be carried out **in pencil** in strict accordance with the mark scheme. In order to help identify any marking issues which might subsequently be encountered in carrying out your duties, **the marked scripts must be brought to the meeting.** (*Section 5c, page 6*)

### 2 After the Standardisation Meeting

- a) Scripts must be marked in **red**, including those initially marked in pencil for the Standardisation Meeting.
- b) All scripts must be marked in accordance with the version of the mark scheme agreed at the Standardisation Meeting.
- c) **Annotation of scripts**

The purpose of annotation is to enable examiners to indicate clearly where a mark is earned or why it has not been awarded. Annotation can, therefore, help examiners, checkers, and those remarking scripts to understand how the script has been marked.

#### **Annotation consists of:**

- the use of ticks and crosses against responses to show where marks have been earned or not earned;
- the use of specific words or phrases as agreed at standardisation and as contained in the final mark scheme either to confirm why a mark has been earned or indicate why a mark has not been earned (eg indicate an omission);
- the use of standard abbreviations eg for follow through, special case etc.

Scripts may be returned to Centres. Therefore, any comments should be kept to a minimum and should always be specifically related to the award of a mark or marks and be taken (if appropriate) from statements in the mark scheme. General comments on a candidate's work must be avoided.

Where annotations are put onto the candidates' script evidence, it should normally be recorded in the body of the answer or in the margin immediately adjacent to the point where the decision is made to award or not award the mark.

**d) Recording of marking: the scripts**

- i) Marked scripts must give a clear indication of how marks have been awarded, as instructed in the mark scheme.
- ii) All numerical marks for responses to part questions should be recorded unringed in the right-hand margin. The total for each question (or, in specified cases, for each page) should be shown as a single ringed mark in the right-hand margin at the end of each question.
- iii) The ringed totals should be transferred to the front page of the script, where they should be totalled.
- iv) Every page of a script on which the candidate has made a response should show evidence that the work has been seen.
- v) Every blank page should be crossed through to indicate that it has been seen. (*Section 8a – d, page 8*)

**e) Handling of unexpected answers**

The Standardisation Meeting will include a discussion of marking issues, including:

- a full consideration of the mark scheme in the context of achieving a clear and common understanding of the range of acceptable responses and the marks appropriate to them, and comparable marking standards for optional questions;
- the handling of unexpected, yet acceptable answers. (*Section 6a, bullet point 5, page 6*)

There will be times when you may not be clear how the mark scheme should be applied to a particular response. In these circumstances, a telephone call to the Team Leader should produce a speedy resolution to the problem. (*Appendix 5, para 17, page 26*)

1	<p>(a) three square file round file hand file half round file square file</p>	(1 x 5)	5	
	<p>(b) round file three square file half round file</p>	(1 x 3)	3	
	<p>(c) length of file, cut of file, no required, shape of file</p>	(1 x 2)	2	
				<b>[10]</b>
2	<p>(a) handle length 2600 AXLE scoop thickness 2, mild steel nylon</p>	(1 x 5)	5	
	<p>(b) (i) length = 1000, width = 400, diameter of 6 British Standards two tabs</p>	(1 x 4)	4 1	
				<b>[10]</b>
3	<p>(a) (i) cutting tool too low (ii) cutting tool too high</p>		1 1	
	<p>(b) eg Method 1 Brazing sketches and notes to show four points from</p> <ul style="list-style-type: none"> <li>• hearth set up to create oven effect</li> <li>• wired components</li> <li>• joint cleaned with emery</li> <li>• use of flux</li> <li>• use of brass</li> <li>• high temp from brazing torch</li> <li>• flux, prevention of oxidation</li> </ul>	(1 x 4)	4	
	<p>Method 2 Riveting sketches and notes to show four points from</p> <ul style="list-style-type: none"> <li>• plate csk on top</li> <li>• csk rivet</li> <li>• length of rivet protruding</li> <li>• use of rivet sets and snap if round head on under side</li> <li>• use of ball of ball pein hammer</li> <li>• drilling two holes in plate first and one in base</li> <li>• followed by fitting one rivet</li> <li>• followed by completion of drilling of second hole and csk</li> </ul>	(1 x 4)	4	
				<b>[10]</b>



4	(a)	(i)	injection moulding, rotational moulding		1		
		(ii)	gravity sand casting		1		
	(b)	painting, powder coating			1		
	(c)	unskilled labour required once plant is running, relatively light weight therefore easy to move in the factory, high production rate, speed of production, range of colour, recycle material			1		
	(d)	(i)	light weight easy to move, easy to clean			1	
		(ii)	heavy therefore less likely to be pushed over or moved, robust, vandal proof			1	
	(e)	will it work		1			
		method of construction		2			
		materials		1		4	
							<b>[10]</b>
5	(a)	C	J				
		E	F				
		A	G				
		D	I				
			Finish Assemble		(1 x 10)	10	
						<b>[10]</b>	



**Mark Scheme 1959/02**  
**June 2007**

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1	(a)	(i)	injection moulding, rotational moulding		1
		(ii)	gravity sand casting		1
	(b)	painting, powder coating		1	
	(c)	unskilled labour required once plant is running, relatively light weight therefore easy to move in the factory, high production rate, speed of production, range of colour, recycle material		1	
	(d)	(i)	light weight easy to move, easy to clean		1
		(ii)	heavy therefore less likely to be pushed over or moved, robust, vandal proof		1
(e)	will it work		1		
	method of construction		2		
	materials		1	4	
				<b>[10]</b>	
2	(a)	C	J		
		E	F		
		A	G		
		D	I		
		Finish Assemble	(1 x 10)	10	
				<b>[10]</b>	
3	(a)	vacuum forming		1	
	(b)	to allow the sachet to be released easily from the pattern		1	
	(c)	to add strength/support to the sides		1	
	(d)	so that the user is less likely to burn their hands, to provide grip		1	
	(e)	ejection pin marks		2	
	(f)	recycle the type of plastic	(1 x 2)	2	
	(g)	sketches and notes to include a web design (thicker material = zero)		2	
				<b>[10]</b>	
4	(a)	cross section			
		draft angle			
		round corners			
smooth surface					
		surface painted	(1 x 4)	4	
(b)	accuracy of manufacture or tolerance has to be within + or – 2/100 of mm	(1 x 2)	2		
(c)	dimensions to include				
	• length of shoulder = 21 or less				
	• diameter of pin = 8				
	• thread for nut				
	• head type	(1 x 4)	4		
				<b>[10]</b>	

5	(a)	safe in use, lever and fit to the hand		2
	(b)	case hardening use of carbon, soaking at red heat, quenching	1 (1 x 2)	3
	(c)	will it work materials construction	(1 x 5)	5
				<b>[10]</b>





**Mark Scheme 1959/03**  
**June 2007**

<b>Q1</b>	(Tool 5) Chuck Key Tool 6 Junior Hacksaw Tool 2 ( Tap ) (Tool 3) Odd-leg/jenny callipers Tool 4 Micrometer	Tightening Drill in m/c (Cutting 3mm steel wire) Cutting thread in hole Marking line parallel to edge ( accurately measuring ... )	(10 x 1)	<b>[10]</b>
<b>Q2</b>	<b>a)</b> Mark position of holes/outline Centre punch hole position Clamp in m/c vice Drill holes Cut/saw off corners File to shape Remove all burrs/sharp edges Clean up ( any other suitable )		(6 x 1)	
	<b>b)</b>	No need for marking/centre punching Makes hole positions accurate in all pieces Speeds up the process/do number at a time	(2 x 1)	
	<b>c)</b>	Safety clothing/goggles Use of guard Clamp work firmly Make sure drill is correctly/tightly in chuck Safe working area	(2 x 1)	<b>[10]</b>
<b>Q3</b>	<b>a)</b>	Hanging bars too thin/not strong enough Only one fixing hole Too many sharp corners Fixing hole too large Brazed joint too weak	(3 x 1)	
		Suitable improvement for each fault	(3 x 1)	
	<b>b)</b>	Suitable Jig (not machine) One mark for each specification point	(4 x 1)	<b>[10]</b>
<b>Q4</b>	<b>a)</b>	Easy to make (and save) changes Ability to import data from other sources 3D simulations Movement of details around drawing No need for drawing space	(2 x 1)	
	<b>b)</b>	Less workers needed for machines Less tiring physical work to be done Cleaner working environment New skills required	(2 x 1)	

	<b>c) (i)</b> CNC Router / Milling Machine/Machining Centre/ Laser Cutter	(1)
	<b>(ii)</b> Computer Numerical Control(led)	(1)
	<b>d)</b> Decision – Select/choose design Activity - Make Prototype Activity - Modify/change/revise design Link from 'modify' box to any other stage	
		(4 x 1) <b>[10]</b>
<b>Q5</b>	<b>a)</b> Pressing/Presswork/Stamping	(1)
	<b>b) (i)</b> Polystyrene(HIPS)/ABS/PVC/Polypropylene	(1)
	<b>(ii)</b> Able to produce any shape required Highly suited to quantity production Quicker than fabricating Gives good quality finish Less waste material/waste re-used Strength of moulding/made in one piece	(1 + 1)
	<b>c)</b> Design mod. (eg lower and longer/added feet/ tapered to give bigger base )	(1)
	Annotation / communication	(1)
	<b>d)</b> Supports securely Allows easy removal Spaces from wall	(3 x 1)
	Annotation / communication	(1)
		<b>[10]</b>

**Total 50**



**Mark Scheme 1959/04**  
**June 2007**

- Q1**
- a)** Easy to make (and save) changes  
Ability to import data from other sources  
3D simulations  
Movement of details around drawing  
No need for drawing space (2 x 1)
- b)** Less workers needed for machines  
Less tiring physical work to be done  
Cleaner working environment  
New skills required (2 x 1)
- c) (i)** CNC Router / Milling Machine/Machining Centre/ Laser Cutter (1)
- (ii)** Computer Numerical Control(led) (1)
- d)** Decision – Select/choose design  
Activity - Make Prototype  
Activity - Modify/change/revise design  
Link from 'modify' box to any other stage (4 x 1) **[10]**
- Q2**
- a)** Pressing/Presswork/Stamping (1)
- b) (i)** Polystyrene(HIPS)ABS/PVC/Polypropylene (1)
- (ii)** Able to produce any shape required  
Highly suited to quantity production  
Quicker than fabricating  
Gives good quality finish  
Less waste material/waste can be re-used  
Strength of moulding/made in one piece (1 + 1)
- d)** Design mod. (eg lower and longer/added feet/  
tapered to give bigger base ) (1)  
Annotation / communication (1)
- d)** Supports securely  
Allows easy removal  
Spaces from wall (3 x 1)  
Annotation / communication (1)

**[1]**

<b>Q3</b>	<b>a)</b> Bevel Gears/Crown Wheel & Pinion	(1)	
	<b>b) (i)</b> Correct Shape Fit to blank / symmetry	(1 + 1)	
	<b>(ii)</b> Tin Snips/Shears/Guillotine Junior Hacksaw Abra File Piercing Saw	(1 + 1)	
	<b>(iii)</b> Annealing	(1)	
	<b>c)</b> Suitable modification (added bracket/bush/pad) Annotation & technical details	(2) (2)	<b>[10]</b>
<b>Q4</b>	<b>a)</b> Explanation including reference to making individual parts to assemble/build-up the object.	(2)	
	<b>b)</b> Suitable method for operation of pulley One mark for each specn. point plus one for Clear annotation/communication	(4)	
	<b>c)</b> Milling m/c; Shaping M/c; Machining Centre	(1)	
	<b>d)</b> Parts made quicker and cheaper Re-usable steel mould All brackets the same Quicker production process (than sand) Good process for producing shaped parts Waste reduced/can be re-used	(3 x 1)	<b>[10]</b>
<b>Q5</b>	<b>a) (i)</b> Benefit 1- eg No storage space needed Quality assurance from supplier Materials available where and when needed All space and staff available for production Clear justification Benefit 2- As Above	(1) (1) (1) (1) (2 x 2)	
	<b>(ii)</b> Disadvantage (eg traffic chaos; reliance on suppliers; expense of delays; etc ) Clear justification	(1) (1)	
	<b>b)</b> Naming application eg Stock Control; Robotics; Control Systems; Security; Communication within industry Clear description	(1) (1)	<b>[10]</b>
		(2 X 2)	

**Total 50**

**General Certificate of Secondary Education**  
**Design & Technology (Industrial Technology) (1959)**  
**June 2007 Assessment Series**

**Component Threshold Marks**

Component	Max Mark	A	B	C	D	E	F	G
1	50	n/a	n/a	30	28	26	24	22
2	50	27	23	20	16	n/a	n/a	n/a
3	50	n/a	n/a	30	26	22	19	16
4	50	28	22	17	11	n/a	n/a	n/a
5	105	79	69	59	47	36	25	14

**Specification Options**

**Foundation Tier**

	Max Mark	A*	A	B	C	D	E	F	G
Overall Threshold Marks	175	n/a	n/a	n/a	97	83	69	55	41
Percentage in Grade	175	n/a	n/a	n/a	23.64	23.17	22.22	14.42	8.27
Cumulative Percentage in Grade	175	n/a	n/a	n/a	23.64	46.81	69.03	83.45	91.73

The total entry for the examination was 461

**Higher Tier**

	Max Mark	A*	A	B	C	D	E	F	G
Overall Threshold Marks	175	127	113	99	85	66	56	n/a	n/a
Percentage in Grade	175	7.62	17.84	26.77	23.79	16.73	4.65	n/a	n/a
Cumulative Percentage in Grade	175	7.62	25.47	52.23	76.02	92.75	97.40	n/a	n/a

The total entry for the examination was 549

**Overall**

	A*	A	B	C	D	E	F	G
Percentage in Grade	4.27	9.99	14.98	23.73	19.56	12.38	6.35	3.64
Cumulative Percentage in Grade	4.27	14.26	29.24	52.97	72.53	84.91	91.26	94.90

The total entry for the examination was 1010

Statistics are correct at the time of publication.





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