



General Certificate of Secondary Education

**Design and Technology
(Electronic Products) 3541/3551
Full or Short Course**

Paper 3551 Foundation

Mark Scheme

2007 examination - June series

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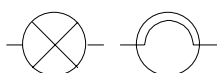
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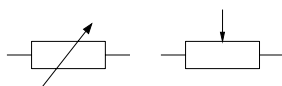
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Question 1

- a (i) Recognisable symbol for diode 1 mark
- (ii) Resistor(Fixed) 1 mark
Correct symbol for fixed resistor 1 mark
- (iii) Bulb or Lamp 1 mark
Correct symbol for lamp 1 mark
(Accept signal or filament symbol)



- (iv) Recognisable symbol for PTM switch 1 mark
- (v) Capacitor 1 mark
Correct symbol for capacitor 1 mark
(Plates must be of equal length)
- (vi) Loudspeaker / speaker 1 mark
- (vii) Variable resistor or potentiometer 1 mark
Either symbol as below 1 mark



- (viii) Recognisable symbol LDR 1 mark

All the only correct answers

12 marks

- b (i) Non polarised 1 mark
- (ii) Non polarised 1 mark
- (iii) Polarised 1 mark
- (iv) Polarised 1 mark
- (v) Polarised 1 mark
- (vi) Non polarised 1 mark
- (vii) Polarised 1 mark

All the only correct answers

7 marks

Total 19 marks

Question 2

a	Examples of methods:		
	<ul style="list-style-type: none"> • Questionnaire of end users • Survey of existing products • Testing products • Internet • Catalogues/books/magazines 		
	Clear/qualified response (must include appropriate detail)	2 x 2 marks	
	Simple response	2 x 1 mark	4 marks
b	Valid and appropriate question e.g.		
	<ul style="list-style-type: none"> • Should it be hand held? • What type of output required? • What age range is it aimed at? • Cost? • Lifespan? • Power source? 	3 x 1 mark	
	Appropriate reason – this must match the question	3 x 1 mark	6 marks
c	Safety – for children		
	Portable – can be used anywhere		
	Qualified response	2 x 2 marks	
	Basic reason	2 x 1 mark	4 marks
Total			12 marks

Question 3

a	<p>The following points could all gain marks:</p> <ul style="list-style-type: none"> • Shorten cathode leg of LED to increase stagger • Insulate legs of LED • Tin ends of flying leads • Use heat shunt on legs when soldering • Use sleeving/insulation to cover soldered joint. 	5 x 1 mark	5 marks
QNS	<p>Clear useful sketch or sketches</p> <p>Appropriate annotation or notes to explain</p>	<p>1 mark</p> <p>1 mark</p>	2 marks
b	Check LED still works or words to that effect		1 mark
c	<p>Appropriate method identified and explained, e.g.</p> <ul style="list-style-type: none"> • Strain holes drilled • Larger diameter • Wire threaded 	<p>1 mark</p> <p>1 mark</p> <p>1 mark</p>	3 marks
d	<p>Orange</p> <p>White</p> <p>Brown</p> <p><i>Must be in this order</i></p>	<p>1 mark</p> <p>1 mark</p> <p>1 mark</p>	3 marks
Total			14 marks

Question 4

5	a	(i)	Resistor connected pins 6&7	1 mark	3 marks
			Capacitor connected to pins 6&7	1 mark	
			Correct position + connection:	1 mark	
			Resistor to 9V (R1) capacitor to 0V (R2)		
			Only correct answers		
		(ii)	Resistor connected between pin 2 and 9V line	1 mark	4 marks
			10k or greater	1 mark	
			PTM switch symbol or correct label	1 mark	
			Connected between pin 2 and 0V line	1 mark	
			Only correct answers		
	QoD		Symbols recognisable and in proportion	1 mark	2 marks
			Clear connections and neat lines (No need for + on capacitor)	1 mark	
b	(i)		Red LED on	1 mark	2 marks
			Green LED off	1 mark	
			Only correct answers		
	(ii)		Green LED on, red LED off	1 mark	2 marks
			End of time constant, green off & red on	1 mark	
c			Correct buzzer symbol	1 mark	2 marks
			Correct connections to pin 3 and 0V line	1 mark	
			Only correct answers		
Total					15 marks

Question 5

a	Track – copper – must be conductor	1 mark	3 marks
	Wand – copper – must be conductor	1 mark	
	Handle – any suitable specific material	1 mark	
b	Three improvements describe, e.g. <ul style="list-style-type: none">• Change of shape• Rounded corners• Sloping sides• Securing wires and track, etc.	3 x 1 mark	3 marks
c	(i) Specific material – HIPS, polystyrene	2 marks	2 marks
	Generic material – plastic, wood	1 mark	
(ii)	Quality of response answer 4 to 6 marks Detailed design and description of suitable improvements, e.g. Change of shape Change of track Change handle/wand Detail of construction Security of wires and track Interchangeable tracks 1 to 3 marks Simple description or not appropriate changes		
(iii)	Two LED's in visible position		1 mark
(iv)	Sound holes in neat pattern		1 mark
(v)	Appropriate switch in logical position	2 marks	2 marks
	Switch type unclear/poor position	1 mark	
QoD	Quality of response answer <ul style="list-style-type: none">• Well drawn, clear and detailed with appropriate notes and annotation• Clear design but lacking detail or notes• Basic sketches lacking clarity and presentation	3 marks 2 marks 1 mark	3 marks

d

Quality of response answer

4 to 6 marks

Detailed and qualified explanation referring to specification points and features shown in their design and matching to a suitable production process such as vacuum forming or using jigs and fixtures

1 to 3 marks

Simple response/unqualified only relating to one or two aspects of the design. Limited or no reference to a production method

6 marks

Total 27 marks

Question 6

- | | | | |
|---|---|------------|---------|
| a | <p>Detailed description of named product type with features that have changed.
e.g. games used to be available only on the pc and had very poor quality displays. High quality games now available on very small hand held devices such as the mobile phone.</p> | 3 marks | |
| | <p>Less detail given – lack reference to past product</p> | 2 marks | |
| | <p>Simple statement</p> | 1 mark | 3 marks |
| b | <p>(i) One qualified statement, e.g.</p> <ul style="list-style-type: none"> • Radiation given off from small portable electronic devices is thought to be potentially dangerous • Lack of exercise causing obesity • Eyesight can be damaged | 2 marks | |
| | <p>Two simple statements</p> | 2 x 1 mark | 2 marks |
| | <p>(ii) One qualified statement, e.g.</p> <ul style="list-style-type: none"> • Reduced personal contact • Growing tendency not to interact with people | 2 marks | |
| | <p>Two simple statements</p> | 2 x 1 mark | 2 marks |
| c | <p>(i) Detailed description advantages.
e.g. Launch of new product can create great interest from the public. Can utilise advances in technology. Able to make greater profit.</p> | 3 marks | |
| | <p>Less detail given</p> | 2 marks | |
| | <p>Simple statement</p> | 1 mark | 3 marks |

(ii)	Detailed description of disadvantages. e.g. Technology becomes outdated, requiring need for constant investment. Raw materials and pollution an increasing problem. Cost of research and development, re-training of staff, recycling of obsolete stock	3 marks	
	Less detail given	2 marks	
	Simple statement	1 mark	3 marks
		Total	6 marks
		Total for the Paper	100 marks