



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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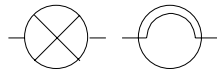
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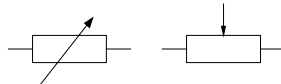
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Question 1

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



- | | | |
|-------|---|------------------|
| (iv) | Recognisable symbol for PTM switch | 1 mark |
| (v) | Capacitor
Correct symbol for capacitor
(Plates must be of equal length) | 1 mark
1 mark |
| (vi) | Loudspeaker / speaker | 1 mark |
| (vii) | Variable resistor or potentiometer
Either symbol as below | 1 mark
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	<p>Examples of methods:</p> <ul style="list-style-type: none"> • Questionnaire of end users • Survey of existing products • Testing products • Internet • Catalogues/books/magazines 	<p>Clear/qualified response (must include appropriate detail) 2 x 2 marks</p> <p>Simple response 2 x 1 mark</p>	<p>4 marks</p>
b	<p>Valid and appropriate question e.g.</p> <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? 	<p>3 x 1 mark</p>	<p>6 marks</p>
	<p>Appropriate reason – this must match the question</p>	<p>3 x 1 mark</p>	<p>6 marks</p>
c	<p>Safety – for children</p> <p>Portable – can be used anywhere</p>	<p>Qualified response 2 x 2 marks</p> <p>Basic reason 2 x 1 mark</p>	<p>4 marks</p>
Total			12 marks

Question 3

a	The following points could all gain marks: <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	Clear useful sketch or sketches Appropriate annotation or notes to explain	1 mark 1 mark	2 marks
b	Check LED still works or words to that effect		1 mark
c	Appropriate method identified and explained, e.g. <ul style="list-style-type: none"> • Strain holes drilled • Larger diameter • Wire threaded 	1 mark 1 mark 1 mark	3 marks
d	Orange White Brown	1 mark 1 mark 1 mark	3 marks
	<i>Must be in this order</i>		
		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: Resistor to 9V (R1) capacitor to 0V (R2)	1 mark		
				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	
	Wand – copper – must be conductor	1 mark	
	Handle – any suitable specific material	1 mark	3 marks
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	
	Generic material – plastic, wood	1 mark	2 marks
	(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		6 marks
	(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	
	Switch type unclear/poor position	1 mark	2 marks
QoD	Quality of response answer		
	<ul style="list-style-type: none"> • Well drawn, clear and detailed with appropriate notes and annotation 	3 marks	
	<ul style="list-style-type: none"> • Clear design but lacking detail or notes 	2 marks	
	<ul style="list-style-type: none"> • Basic sketches lacking clarity and presentation 	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	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.	3 marks	
	Less detail given – lack reference to past product	2 marks	
	Simple statement	1 mark	3 marks
b	(i) One qualified statement, e.g. <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	
	Two simple statements	2 x 1 mark	2 marks
	(ii) One qualified statement, e.g. <ul style="list-style-type: none"> • Reduced personal contact • Growing tendency not to interact with people 	2 marks	
	Two simple statements	2 x 1 mark	2 marks
c	(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.	3 marks	
	Less detail given	2 marks	
	Simple statement	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