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GCSE 2004
June Series

ASSESSMENT and QUALIFICATIONS ALLIANCE

Mark Scheme

Design and Technology: Electronic Products
(3551 – Short Course Foundation)

Mark schemes are prepared by the Principal Examiner and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation meeting attended by all examiners and is the scheme which was used by them in this examination. The standardisation meeting ensures that the mark scheme covers the candidates' responses to questions and that every examiner understands and applies it in the same correct way. As preparation for the standardisation meeting each examiner analyses a number of candidates' scripts: alternative answers not already covered by the mark scheme are discussed at the meeting and legislated for. If, after this meeting, examiners encounter unusual answers which have not been discussed at the meeting they are required to refer these to the Principal Examiner.

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The answers given in the following mark schemes are neither exhaustive nor exclusive. Candidates whose answers do not appear directly on the mark scheme, but who have demonstrated knowledge, understanding or skills relevant to the question will receive appropriate credit for their answers.

Further copies of this Mark Scheme are available from:

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ASSESSMENT AND QUALIFICATIONS ALLIANCE

GENERAL CERTIFICATE OF SECONDARY EDUCATION

Summer Examination 2004

Design and Technology: Electronic Products

Short Course: Foundation Tier

Question 1

(a)	(i)	Light Dependant Resistor, LDR.	(1 mark)
	(ii)	Variable Resistor, Potentiometer, Preset Resistor.	(1 mark)
	(iii)	Resistor	(1 mark)
	(iv)	Transistor.	(1 mark)
(b)	Input	- VR and LDR or A and B, (relate to a (i) and a (ii))	(2 marks)
	Process	- Resistor and transistor or C and D. (relate to a (iii) and a (iv))	(2 marks)
	Output	- Lamp or Bulb.	(1 mark)
(c)	Rises.		(1 mark)
(d)	To detect light change, to control the switching of the transistor. To act as part of the potential divider, resistance changes when it gets dark and this acts with the VR to change the base voltage. Any other appropriate response – 1 mark each		(2 marks)
(e)	Collector, base, emitter.		(3 marks)
(f)	(i)	Double and throw – 1 mark each 1 mark for simple response, 2 marks for qualified response	(2 marks)
	(ii)	e.g. The lamp will not drain the battery. RL once switched will require less current.	(2 marks)

Total 19 marks

Question 2

(a) Monostable. (1 mark)

(b) Feature 1 mark, Orientation 1 mark

e.g.	LED	- short leg, flat side	(1 mark)	
		- to 0V	(1 mark)	(2 marks)
	IC	- dimple, dot, notch	(1 mark)	
		- dot indicates Pin 1	(1 mark)	(2 marks)

(c) (i) C1, capacitor, polorised or electronic capacitor (1 mark)

(ii) To start the time delay, set the timer, start the timing period, trigger pin 2, or any valid reason (1 mark)

(d) Formula (1 mark)
Substituting correct values (1 mark)
Answer with units (1 mark)

(e) Multimeter, avometer etc. (1 mark)

(f) (i) 9 or 9V (1 mark)

(ii) 0 or 0 ohms (1 mark)

Total 13 marks

Question 3

(a) Detailed designs showing materials and suitable construction methods with appropriate location of switches and LED. 7 - 9 marks

Designs which show and suggest materials and construction methods for each case. 4 – 6 marks

Maximum 4 marks for single complete design

Basic designs which show materials and construction method for at least one case. 1-3 marks (9 marks)

Quality of drawings:

Detailed and accurate drawings using appropriate techniques. (3 marks)
Well drawn and clearly recognisable designs (2 marks)
A basic drawing without detail or lacking any element of accuracy. (1 mark)
Unrecognisable as a design for a container (0 marks) (3 marks)

(b)
- Specific material (1 mark)
- Identify construction method (1 mark)
  Explanation / suitability of form (1 mark) (2 marks)
- Some dimensions added (1 mark)
  Large enough to hold circuit, battery and components (1 mark) (2 marks)
- Basic indication of access, e.g. battery panel (1 mark)
  Greater detail for both circuit and battery (2 marks)
  Full detail of access (3 marks) (3 marks)

Each component appropriately located (1 mark for each) (3 marks)

Quality of drawing:

Detailed and accurate drawings using appropriate techniques. (3 marks) (3 marks)
Well drawn and clearly recognisable design with some additional detail. (2 marks)
A basic drawing lacking detail. (1 mark)

Total 26 marks

Question 4

(a) Suitable command for lights and time delay, 1 mark each (5 marks)

(b) (i) Simple response – 1 mark e.g. not enough power
Qualified response – 2 marks (2 marks)

(ii) Simple response - 1 mark
Qualified response - 2 marks (2 marks)

Total 9 marks

Question 5

(a) (i) Printed circuit board. (1 mark)
(ii) Computer Aided Design. (1 mark)

(b) (i) Track. (1 mark)
Pad (1 mark)
(ii) Tracks thicker, end of tracks joined closer to pads/other tracks.
No cross tracks, smaller circuit.
Larger pads/ thicker line, add text, any valid response.
Any three. (3 marks)

(c) Single statement 1 mark. Qualified statement or 2 single statements - 2 marks
e.g. Activity undertaken during making vero, CAM or Photo etch (2 marks)
Tools and equipment suitable for activity. (2 marks)
Health and safety linked to activity. (2 marks)
Quality Issues linked to activity. (2 marks)

Avoid heated parts, soldering iron/stand. Replace iron to stand when not in use. Work in ventilated area. Wash hands after use. (2 marks)

Keep iron tip clean. Warm both components and track. Avoid excessive heat. Avoid excessive use of solder. (2 marks)

Total 19 marks

Question 6

(a) The material can be recycled. (1 mark)

(b) (i) Plastic – disposal of waste, pollution during manufacture, non renewable, any other appropriate response. (1 mark)

(ii) Metal - disposal of waste as recycled values fluctuate, cost of recycling, any other appropriate response. (1 mark)

(c) To protect – prevent damage to product.
To inform – provide instructions as to use.
To market – attractive packaging to help promote.
Any two (2 marks)

(d) (i) Smaller sizes, lightweight, many functions, other suitable developments.
Any three (3 marks)

(ii)

Consumer	–	used more, expensive bills, possible health risk, more attractive to thieves.	(1 mark)
Society	–	noise, intrusion, anti social, crime.	(1 mark)
Environment	–	disposal, batteries/cases, masts.	(1 mark)

(e) Smaller, lighter, other functions - games, interactive games, video, camera live transmissions.
Any viable three. (3 marks)

Total 14 marks