

GCSE 2004

June Series

Mark Scheme

Design and Technology: Electronic Products *(3551 - Short Course Higher)*

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.

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ASSESSMENT AND QUALIFICATIONS ALLIANCE
GENERAL CERTIFICATE OF SECONDARY EDUCATION

Summer Examination 2004

Design and Technology: Electronic Products

Short Course: Higher Tier

Question 1

- (a) Monostable (1 mark)
- (b) (i) Electrolytic capacitor or capacitor (3 marks)
LED
IC
- (ii) Feature 1 mark, orientation 1 mark
e.g. Electrolytic capacitor – band on outside of casing marked
– leg nearest to 0V or short leg.
LED - short leg or flat side of case to 0V
or - long leg or rounded case to +V
IC - dimple or dot or notch on left edge of casing
or - pin 1 next to dimple or dot or notch (6 marks)
- (c) R1 and C1 (must be R1 but capacitor will do) (2 marks)
- (d) SW1 – to start the time delay, set the timer, start the timing period,
trigger pin 2, or any valid reason (1 mark)
- (e) formula (1 mark)
substituting correct values (1 mark)
answer with units (1 mark)
- (f) Tolerance of capacitor +/- 25% or 20% therefore it was the most likely
variable – 2 marks
Some mention of inaccuracy, leakage – 1 mark (2 marks)
- (g) (i) 6 to 9V (1 mark)
(ii) 0V (1 mark)

Total 20 marks

Question 2

(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 design which shows 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 x 3)	(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 marks)	

Total 26 marks

Question 3

- (a) Suitable commands for lights and time delay.
 E.g. Green Lamp ON - Switch on 8, output 8, on 8.
 For 0.2 sec - For 0.2, Delay 0.2, Wait 0.2 Red
 and Blue ON - Switch on 3, output 3, on 3
 or reference to 1, 2 (5 marks)
- (b) (i) simple response – 1 mark e.g. not enough power qualified
 response – 2 marks (2 marks)
- (ii) Resistor and Transistor or just transistor. (1 mark)
 Correct symbols. (1 mark)
 Lamp connected and will light. (1 mark)
- Lines drawn with dots for junctions. (1 mark)
- (iii) Resistor controls current to base. (1 mark)
 Transistor amplifies current. (1 mark)
- Total 13 marks**

Question 4

- (a) (i) Tracks thicker, end of tracks joined closer to pads/other
 tracks. No cross tracks, smaller circuit. Add text. Any
 valid response. Any three (3 marks)
- (ii) All correct stages / sequence identified (4 marks)
 e.g. left click / select tools properties etc
 left click / select – problem menu
 select change required
 press ‘enter’ or left click ‘ok’.
- Most stages identified (3 marks)
 Some stages identified (2 marks)
 Limited reference to change (1 mark) (4 marks)
- (b) Activity undertaken during making vero, CAM or Photo etch. (1 mark)
 Tools and equipment suitable for activity. (1 mark)
 Health and safety linked to activity. (1 mark)
 Quality Issue linked to activity. (1 mark)
- Activity undertaken during making vero, CAM or Photo etch. (1 mark)
 Tools and equipment suitable for activity. (1 mark)
 Health and safety linked to activity. (1 mark)
 Quality Issue linked to activity. (1 mark)
- Total 15 marks**

Question 5

- (a) It can be recycled. (1 mark)
People more likely to recycle it, or other environmental benefit. (1 mark)
- (b) (i) eg To protect – prevent damage to product.
To inform – provide instructions as to use.
To market – attractive packaging to help promote. (4 marks)
- (ii) Lack of landfill sites, pollution, long term breakdown of materials etc. Any two (2 marks)
- (c) (i) Consumers (advantage) – convenience, smaller, lighter, features. (3 marks)
- Consumers (disadvantage) – can run up heavy bills, possible health risk. (3 marks)
- (ii) Society (advantage) – greater communication potential, speedy transactions. (3 marks)
- Society (disadvantage) – less face to face interaction, noise pollution. (3 marks)
- (iii) Environment (advantage) – less need for telephone cables, phone boxes. (3 marks)
- Environment (disadvantage) – masts, problems with disposal. (3 marks)

One mark x 3 for advantage.
One mark x 3 for disadvantage.
One mark x 6 for partial explanation.
Two marks x 6 for full explanation.

Total 26 marks