

# GCSE 2004

## *June Series*



# Mark Scheme

## Design and Technology: Resistant Materials Technology *(3545/Full Course Foundation)*

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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**

June Examination 2004

**Design and Technology: Resistant Material Technology**

**Full Course Foundation Tier**

**Question 1**

Any **four** correctly identified requirements.

Possible responses:

- Must securely hold the garden tools and equipment
- Must be soundly constructed
- Must be capable of being manufactured in quantity
- Must be safe to use (not harm user) (not harm contents)
- Must fit into the garden environment
- Must allow easy movement around the garden (wheels)
- Must be weather proof
- Durable/robust
- Sturdy
- Protection of contents
- Light weight
- Balanced
- Reasoned references to how to store
- Ergonomic or anthropometric references
- Handle to guide or push/pull
- Not affected by corrosive chemicals
- Drainage holes
- Help organisation

(4 x 1 mark)

**Four** correct explanations

(4 x 1 mark)

**Total 8 marks**

**Question 2**

Variety of ideas

Mark each idea separately against the following scheme

- An excellent idea which, differs in approach or principal, fulfils the design brief, specification and shows originality. (6 marks)
  - A very good idea which differs in approach or principle, fulfils the design brief and the specification. (5 marks)
  - A good idea which differs in approach or principle, fulfils most of the design brief and specification. (4 marks)
  - An idea which fulfils some of the design brief and the specification. (3 marks)
- 
- An idea which is very similar to the other ideas. (2 marks)
  - A simple idea. (1 mark)

(3 x 6 marks)

Mark these sections first

Quality of sketches

1 sketch can be awarded 5 marks

- Quality 3D rendered sketches (5 marks)
- Quality line sketches or an attempt at 3D sketches, see B (2 – 4 marks)
- Simple line sketching (1 mark)

Quality of notes

- Detailed explanation (3 – 4 marks)
- Labelling (1 – 2 marks)

**Total 27 marks**

**Question 3**

- (a) Any **two** correct reasons which relate to the performance of the design. (2 x 1 mark)  
Reasoned response only
- (b) Method of construction
- A suitable method of construction, correct in detail and proportion. (5 – 6 marks)  
A suitable detailed process, with inaccuracies. (3 – 4 marks)  
Limited detailed process given (2 marks)  
Recognisable process identified (1 mark)
- OR
- Complete assembly details given (3 marks)  
Some assembly details given (2 marks)  
Simple assembly details given (1 mark)
- Mark these sections first
- Quality of sketches
- Quality sketches (2 marks)
  - Simple sketching (1 mark)
- Quality of notes
- Detailed notes (2 marks)
  - labelling (1 mark)

**Total 12 marks**

**Question 4**

- (a) Possible responses:  
Must relate to material
- It is weather proof
  - It is easy to keep clean
  - It is colourful
  - It has a shiny attractive finish
  - It does not need gluing/sticks to most surfaces
  - Strong/tough
  - Flexible – follows contours
  - Looks good
  - Cheap unqualified (0 marks) (2 x 1 mark)
- Two** correct explanations (2 x 1 mark)
- (b) **Two** changes required  
Possible responses:
- Text has been enlarged
  - Font has been changed
  - Text has been emboldened
  - Text has been made italic (2 x 1 mark)
- Via marks if appropriate
- (c) **Two** advantages required  
Possible responses:
- Quicker to manufacture
  - Increased accuracy
  - Increased consistency
  - Professional quality
  - Less labour required
  - References to editing
  - References to safety (2 x 1 mark)
- Two** relevant explanations required (2 x 1 mark)
- (d) **Two** quality control checks required  
Possible responses:
- Check design of label is correct
  - Check quality and colour of vinyl
  - Check accuracy of cut label
  - Spelling
  - Layout
  - Font
  - Size (2 x 1 mark)
- Two** relevant explanations required (2 x 1 mark)

**Total 14 marks**

**Question 5**

- (a) **Two** reasons required  
Possible responses:
- The tools will be very difficult to use
  - The tools will be dangerous to use
- (2 x 1 mark)
- Two** relevant explanations required (2 x 1 mark)
- (b) Award **one** mark **each** for any of the following ergonomic features:
- Rounded edges (1 mark)
  - Simple shaping (1 mark)
  - Complex shaping (finger/thumb grooves) (2 mark)
  - Textured surface (2 mark)
  - Evidence of a hilt/ferrule (1 mark)
  - RH / LH considerations (1 mark)
- Tick up to max 5 (5 marks)
- Mark first  
Quality sketch (2 marks)  
Simple sketch (1 mark)
- (c) Award **one** mark **each** for naming **two** ergonomic features. (2 x 1 mark)
- Award **one** mark each for explaining **each** ergonomic feature.  
Possible responses:
- It improves the comfort of using the tool
  - It improves the grip when using the tool
  - It makes the tool easier to use
  - It makes the tool safer to use
- (2 x 1 mark)
- Colour (0 marks)

**Total 15 marks**

**Question 6**

- (a) **Garden furniture A** Award **one** mark for the generic term wood / hardwood  
Award **two** marks for any suitable durable solid wood.

Possible responses:

Any specific durable

- Beech
- Ash
- Oak
- Teak
- Mahogany
- Pine
- Birch

(2 x 1 mark)

Reasons

Possible responses: (Correct response for incorrect material ok)

- Attractive
- Strong
- Durable
- Weather proof
- Weight related
- Environment Related
- Cheap if pine

(1 x 1 mark)

- Garden furniture B** Award **one** mark for the generic term plastic  
Award **two** marks for any suitable specific plastic.

Possible responses:

- ABS
- GRP
- HIPS
- Polycarbonate
- Polypropylene PP
- HDPE
- PVC

(2 x 1 mark)

Reasons

Possible responses:

- Immaculate surface finish
- Self coloured
- Ideal for quantity production
- Durable
- Weatherproof
- Lightweight

(1 x 1 mark)



**Garden furniture C** Award **one** mark for the generic term metal

Award **two** marks for any suitable specific metal

Possible responses:

- Stainless steel
- Aluminium
- Steel

(2 x 1 mark)

Reasons

Possible responses:

- Good strength to weight ratio
- Durable/strong
- Cost (inexpensive) (steel only)
- Suitable for quantity production
- Weatherproof (AL and ST steel only)

(1 x 1 mark)

(b) **Garden furniture A**

Award **one** mark for any suitable specific finish. Must relate to photo chosen in section (a)

Possible responses:

- Natural eg teak
- Wax
- Polyurethane Varnish
- Stain
- Teak Oil
- Ronseal
- Sikkens

Finishing processes e.g. sanding (0 marks)

(1 x 1 mark)

**Garden furniture C**

Award **one** mark for any suitable specific finish

Possible responses

- Anodised (aluminium only)
- Cellulose spray
- No finish (ST steel and aluminium)
- Lacquer
- Polish or polished
- Chrome plate (steel only)

(2 x 1 mark)

(c) Award **one** mark each for **two** reasons

Possible responses

- It is not affected by the weather
- It is self coloured
- It has a perfectly smooth surface
- It has a high gloss finish

(2 x 1 mark)

**Total 13 marks**

**Question 7**

- (a) Award **one** mark for each feasible question  
Must be questions not answers

Possible responses:

- Do have a patio?
- Do you sit outside?
- Do you eat outside in summer?
- Do you prefer wood, metal or plastic furniture?
- How much would you be prepared to pay for a set of patio furniture? (4 x 1 mark)

- (b) Award **one** mark each for **two** advantages of plastics over woods

Possible responses:

- Less expensive
- More colourful
- Waterproof – can stay outside
- Easier to keep clean
- Easier to store – stackable
- Easier to transport (2 x 1 mark)

**Two** relevant explanations required (2 x 1 mark)

**Total 8 marks**

**Question 8**

- (a) Award **one** mark each for **three** advantages

Possible responses:

- They take up less space
- They are easier to handle
- They are easier to stack
- They are easier to transport
- The manufacturer does not have to employ people to assemble the furniture
- Can be taken apart again for winter storage (3 x 1 mark)

(b) Award up to **two** marks depending upon the quality of each explanation

Weight	Explanation: The box weighs 25 kg The box is heavy  Importance: The box is heavy and care should be taken when lifting it
Umbrella	Explanation: The box should be protected from the rain  Importance: If the box is not protected the box and its contents may suffer
Bar code	Explanation: The box should be stored with the arrow facing upwards  Importance: If the box is not stored with the arrow facing upwards the contents may suffer

(6 x 1 mark)

**Total 9 marks**

### **Question 9**

(a) Award **one** mark for **each** correctly entered cell

<b>Situation</b>	<b>Risk</b>	<b>Precaution</b>
<i>Adhesive comes into contact with skin</i>	<i>Adhesive irritates/burns skin</i>	<i>Wear disposable gloves/use a spatula</i>
<i>Adhesive catches fire</i>	Fire burns someone/sets building on fire/gives off toxic fumes	Do not use near a flame
<i>Adhesive comes into contact with eyes</i>	Adhesive irritates eyes	Wear safety glasses
<i>Fumes are inhaled by the user</i>	User has difficulty breathing/fumes overpower user/fumes damage respiratory system	Open a window/use in a well ventilated area/wear a respiratory mask

(6 x 1 mark)

**Total 6 marks**

**Question 10**

- (a) Award
- one**
- mark each for
- two**
- correct reasons

Possible responses:

- Easily vacuum formed
- Relatively inexpensive (cheap)
- Suitable for quantity production
- Waterproof
- Easily cleaned
- Re-cycle or environmental
- Flexible

(2 x 1 mark)

- (b) Award
- one**
- mark each for each correctly identified feature:

- Feature A: Rounded corners
- Feature B: Draft / tapered side / sloping sides
- Feature C: Air extraction holes / vent holes

(3 x 1 mark)

- (c) Award
- one**
- mark for the generic term wood / metal
- 
- Award
- two**
- marks for any suitable specific wood / metal
- 
- Possible responses:

- MDF
- Any suitable close grain hardwood
- Aluminium
- Steel
- Resin
- Pine

(2 x 1 mark)

- (d) Award
- one**
- mark each for any part of the process which is in the correct sequence. Apply exactly

Place the former/mould in the machine
Lower the former/mould
Heat the plastic sheet
Raise the former/mould
Switch on to vacuum
Cool and remover the former/mould

6 x 1 mark  
**Total 13 marks**