

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS  
GCE Advanced Subsidiary Level and GCE Advanced Level

**MARK SCHEME for the October/November 2009 question paper  
for the guidance of teachers**

**9705 DESIGN AND TECHNOLOGY**

**9705/32**

Paper 32 (Written 2), maximum raw mark 120

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

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## Section A

### Part A – Product Design

- 1 (a) Appropriate material including:
- aluminium/brass
  - acrylic/polyester resin
  - hardwood – beech, yew 1

Reasons including:

- takes a good finish/easy to turn
- good aesthetic qualities
- easy to clean, not react to wax

2 × 1

[3]

- (b) Description to include:
- appropriate method
  - marking, turning, forming (cast resin)

Quality of description:

- fully detailed 3–7
- some detail 0–2

Quality of sketches up to 2

[9]

- (c) Explanation could include:
- change in process
  - change in materials
  - use of jigs, formers, moulds
  - simplification of design

Quality of explanation:

- logical, structured 4–6
- limited detail 0–3

Quality of sketches up to 2

[8]

[Total: 20]

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- 2 (a) Description of process
- fully detailed 3–5
  - some detail 0–2
- Quality of sketches up to 2 7 × 2 [14]
- (b) Comb/finger joint
- strong joint/resist stress
  - good gluing area
  - can be attractive
- Vacuum forming
- one piece production/very quick
  - even wall thickness
  - waste reused
  - complex shapes formed
- Casting
- no wastage
  - good structural quality
  - quick production, minimal assembly and machining 3 × 2 [6]
- [Total: 20]

- 3 Discussion could include:
- Cultural issues
- avoid offence
  - target needs and wants
- Ethical issues
- appropriate product
  - targeting/green issues
- Economic climate
- pricing/promotion/placement strategies
  - target market research/value for money
- Examples/evidence could be
- symbols/religion
  - cultural traditions
  - possible inappropriate products e.g. 'toy guns'
  - excess packaging
  - recycled materials or protected species (e.g. timber/fur)
  - price reduction examples, complexity/unnecessary product
- Examination of issues
- wide range of relevant issues 4–8
  - limited range 0–3
- Quality of explanation
- logical, structured 4–8
  - limited detail 0–3
- Supporting examples/evidence 4

[Total: 20]

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## Part B – Practical Technology

- 4 (i) Use correct rule/watch fingers  
Use mat  
Care/patience/do not attempt to cut thick sheet
- (ii) Use holder/care from heated parts  
Fume awareness  
Goggles if carrying out lot of component soldering/solder removal
- (iii) Hold sheet correctly  
Fix tool, correct speed  
Chuck key/goggles
- (iv) Appropriate ventilation  
Keep off skin/cyano-acrylates  
Do not ingest/protect eyes (plastic solvents)
- (v) Hot component/machine  
Avoid overheating/fumes  
Use gloves when handling/forming
- (vi) Appropriate ventilation/dust extraction  
User wear mask  
Eye protection if used on abrading machine
- (vii) Secure tool/work-piece  
Correct speed  
Goggles/hair tied back

For **five** safety precautions described in detail up to 3 marks  
Quality of communication 5 × 1

5 × 4

[20]

[Total: 20]

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- 5 (a) Name of product 5 × 1 mark
- (b) Explanation of suitability 5 × 3 marks
- [Total: 20]**
- 6 (a) (i) Resistance to surface marking/abrasion
- (ii) Resistance of a material to tensile loading (pulling/stretching forces) 2 × 2 [4]
- (b) (i) Hardness test described 4
- Quality of sketch 1
- (ii) Tensile test described 4
- Quality of sketch 1 [10]
- (c) Quality of explanation 4 maximum
- Appropriate examples 2 [6]
- [Total: 20]**

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Part C – Graphic Products

7	(a) Correct front elevation	4	
	Correct sectional view	5	
	Accuracy/line quality	3	[12]

- (b) Discussion could include:
- ease/quantity of storage files
  - portability
  - digital transfer/internet

- Examples/evidence could be:
- portable disc drives/USB
  - global transfer/sharing of design files (leading car companies)
  - internet databases e.g. anthropometric data

Examination of issues	3	
Quality of explanation	3	
Supporting examples/evidence	2	[8]

[Total: 20]

8	(a) Correct isometric/overall shape/proportion	3	
	Isometric circles	3	
	Twice full size	1	
	Accuracy quality of line-work	3	[10]

(b) Understanding of perspective	4	
Quality of explanation	4	
Use of examples	2	[10]

[Total: 20]

9	Description of product	2	
	Explanation of changes		
	<ul style="list-style-type: none"> <li>• detailed, fully explained</li> <li>• limited detail</li> </ul>	4–7 0–3	

Explanation of reasons for changes		
<ul style="list-style-type: none"> <li>• detailed, fully explained</li> <li>• limited detail</li> </ul>	4–7 0–3	

Quality of communication	4	[20]
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[Total: 20]