

**CAMBRIDGE INTERNATIONAL EXAMINATIONS**

**GCE Advanced Level**

**MARK SCHEME for the October/November 2012 series**

**9705 DESIGN AND TECHNOLOGY**

**9705/33**

Paper 3, 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) description of process
- fully detailed 3–5
  - some detail, 0–2
- quality of sketches up to 2  
7 x 2 [14]
- (b) vacuum forming
- range of colours
  - quick process
  - no finishing required
- drilling and boring
- Cylindrical material removal
  - accurate
  - single machine operation
- edged and veneered
- attractive
  - dimensionally stable
  - reduced weight/cost
  - environmentally friendlier 3 x 2 [6]
- [Total: 20]
- 2 (a) suitable material including:
- Aluminium/brass
  - MF, ABS
  - Appropriate hardwood 1
- Reasons including:
- Quality of finish – colour/attractive grain/texture
  - Easy to machine
  - Scratch resistant 2 x 1 [3]
- (b) description to include:
- quality of description:
- fully detailed 3–7
  - some detail, 0–2
- quality of sketches up to 2 [9]

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

quality of explanation:

- logical, structured
- limited detail,

quality of sketches

4-6  
0-3  
up to 2 [8]

**[Total: 20]**

- 3 (a) examples could be:
- grip – width/length
  - finger / thumb operation
  - screen clarity
  - ease of opening lid

4 x 3 [12]

- (b) Discussion could include:
- cost
  - increased functionality
  - materials
  - size/weight

examples / evidence could be

- Specific materials/components
- Specific functions

examination of issues

quality of explanation

supporting examples / evidence

3  
3  
2 [8]

**[Total: 20]**

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**Part B – Practical Design**

- 4 (a) (i)** SPST, DPDT, micro, tilt  
 name (1 mark) application (1 mark), explanation (up to 3) [4]
- (ii)** thermistor, probe  
 name (1 mark) application (1 mark), explanation (up to 3) [4]
- (iii)** LDR, photoresistor  
 name (1 mark) application (1 mark), explanation (up to 3) [4]

**(b) applications – video, audio, mechanical**

- quality of explanation
- logical, structured/detailed 4–6
  - limited detail, 0–3
- supporting examples  
 mp3 player, phone, tele-printer up to 2 [8]

**[Total: 20]**

- 5 (a)** mortice and tenon (square, sloping haunch other variation) dowel.  
 Name (1 mark) sketch (up to 2 marks) 3 x 2 [6]

- (b)** Cam lock, blocks  
 Name (1 mark) sketch (up to 2 marks) 3 x 2 [6]

- (c)** benefits could be:
- reduce assembly time
  - reduce costs
  - ease transportation/storage
  - mix and match components
- examples / evidence could be
- Specific product
  - Modular (mix and match) opportunities
- examination of issues 3  
 quality of explanation 3  
 supporting examples / evidence 2 [8]

**[Total: 20]**

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- 6 (a) (i) leaf, skeleton, egg
- (ii) building, bridge, tower
- (b) monocoque – shell structure, plane fuselage, car body  
frame – pylon, bridge
- examples (1 mark) 2 x 1  
understanding of monocoque and frame 2  
comparisons up to 4 [8]
- (c) (i) description of strut up to 2  
description of tie up to 2 [4]
- (ii) triangulation  
ties, struts  
gusset plates
- quality of explanation  
– logical, structured 4–6  
– limited detail, 0–3 [6]
- [Total: 20]**

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**Part C – Graphic Products**

- 7 Correct planometric / scale detail – walls / positioning [4]  
 – table [4]  
 – seat [3]  
 – arch [5]  
 – barbecue [3]

**[Total: 20]**

- 8 (a) materials - high density foam, (can be fabric covered), rubber composites (open cell styrene, butadiene rubber or open cell SBR) with fabric bonded to the upper surface. Accept fabric, recycled rubber tyres, neoprene, silicone rubber, leather, glass, cork, wood, aluminum, stone and stainless steel. (1 mark)

- Reasons – friction for mouse ball,  
 – takes print  
 – will not scratch table, desk surface ( up to 2 marks) [3]

- (b) appropriate method, offset lithography, screen, gravure, flexography, transfer quality of description:  
 – fully detailed 3–5  
 – some detail, 0–2  
 quality of sketches up to 2 [7]

- (c) discussion could include:  
 – waste of resources  
 – throw away culture/ litter  
 – costs must be covered elsewhere
- examples / evidence could be  
 – Specific promotion  
 – Specific environmental/issue
- examination of issues 4  
 quality of explanation 4  
 supporting examples / evidence 2 [10]

**[Total: 20]**

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- 9 (a) correct, working development  
correct scale  
tabs  
accuracy/line quality
- (b) quality of description:  
– fully detailed  
– some detail,  
quality of sketches
- 2  
2 [10]
- 5–8  
0–4  
up to 2 [10]

**[Total: 20]**