

**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.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

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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

<b>4</b>	<b>(a) (i)</b> SPST, DPDT, micro, tilt name (1 mark) application (1 mark), explanation (up to 3)		[4]
	<b>(ii)</b> thermistor, probe name (1 mark) application (1 mark), explanation (up to 3)		[4]
	<b>(iii)</b> LDR, photoresistor name (1 mark) application (1 mark), explanation (up to 3)		[4]
	<b>(b)</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]
			<b>[Total: 20]</b>
<b>5</b>	<b>(a)</b> mortice and tenon (square, sloping haunch other variation) dowel. Name (1 mark) sketch (up to 2 marks)	3 x 2	[6]
	<b>(b)</b> Cam lock, blocks Name (1 mark) sketch (up to 2 marks)	3 x 2	[6]
	<b>(c)</b> benefits could be:		
	– reduce assembly time		
	– reduce costs		
	– ease transportation/storage		
	– mix and match components		
	examples / evidence could be		
	– Specific product		3
	– Modular (mix and match) opportunities		3
	examination of issues		3
	quality of explanation		3
	supporting examples / evidence	2	[8]
			<b>[Total: 20]</b>

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6	(a) (i)	leaf, skeleton, egg		[1]
	(ii)	building, bridge, tower		[1]
	(b)	monocoque – shell structure, plane fuselage, car body frame – pylon, bridge		
		examples (1 mark)	2 x 1	
		understanding of monocoque and frame comparisons	2	
			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]
				<b>[Total: 20]</b>

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### Part C – Graphic Products

- 7 Correct planometric / scale [2]  
 detail – walls / positioning [3]  
 – 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 4  
correct scale 2  
tabs 2  
accuracy/line quality 2 [10]

(b) quality of description:  
– fully detailed 5–8  
– some detail, 0–4  
quality of sketches up to 2 [10]

**[Total: 20]**