CAMBRIDGE
INTERNATIONAL EXAMINATIONS

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GCE Advanced Subsidiary Level and GCE Advanced Level

MARK SCHEME for the November 2003 question papers

9705 DESIGN AND TECHNOLOGY

9705/01	Paper 1 (Written 1), maximum raw mark 120
9705/03	Paper 3 (Written 2), maximum raw mark 120

These mark schemes are published as an aid to teachers and students, to indicate the requirements of the examination. They show the basis on which Examiners were initially instructed to award marks. They do not indicate the details of the discussions that took place at an Examiners' meeting before marking began. Any substantial changes to the mark scheme that arose from these discussions will be recorded in the published *Report on the Examination*.

All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes must be read in conjunction with the question papers and the *Report on the Examination*.

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CAMBRIDGE
INTERNATIONAL EXAMINATIONS

November 2003

GCE A AND AS LEVEL

MARK SCHEME

MAXIMUM MARK: 120

SYLLABUS/COMPONENT: 9705/01

DESIGN AND TECHNOLOGY

Written 1

Section A

1	(a)	Description could involve: - mark out batch using template - cut to shape - clean edges - polish edges - heat and fold to shape	1 1 1 1 1	5	
	(b)	Marking out Clean edges Final production	3 x 1	3	8
2	(a)	Discussion could involve: - expensive initial outlay - cheaper to run in the long term - time delay when charging - tend to lose performance with age. Critical examination of issues up to 2 marks Quality of explanation up to 2 marks	4	4	
	(b)	Explanation could involve: - leaking batteries - corrosion - toxicity etc Good explanation covering most aspects Simple explanation of one aspect	2-3 0-1	3	7
3	(a)	Some understanding shown 1 mark Good understanding shown 2 marks	2		
	(b)	As for (a)	2		
	(c)	Three advantages identified 3 x 1 Detailed discussion up to 2 marks	5	9	9
4		Lightweight Easy to assemble Clear instructions to put stamps in here Minimal cost Attractive	4 x 1	4	4
5	(a)	Any suitable suggestion – plastic dip coat, chrome plate, paint.	2 x 1	2	
	(b)	Suitable solution presented. Feasibility Explanatory notes	1 3	4	
	(c)	Three types of testing identified 3 x 1 Description of how each test would be carried out 3 x 1	6	6	12

Total = 40

Section B

6	(a)	Suitable timber named – teak, beech.	1	1	
	(b)	Suitable manufactured board named – MDF, Plywood.	1	1	
	(c)	Excellent sketching techniques shown. All stages covered and in order. Tools and machines identified.	7-9		
		Sketching of a good standard. Most identified and in reasonable order. Majority of tools and machines named.	3-6		
		Basic sketching techniques used. Only a few stages considered with limited knowledge of tools and equipment.	0-2	9	
	(d)	Excellent sketching techniques shown. All details of the joining method described and would clearly work to provide self assembly.	6-7		
		Sketching of a good standard. Suitable details of the joining method shown and it would most probably provide reasonably easy self assembly.	3-5		
		Basic sketching techniques used. Limited details of joining method with only possible chance of success. Little change of self assembly.	0-2	7	
	(e)	Any two sensible suggestions: - Plane smooth joints - Sand up to smooth surface.	2 x 1	2	20
7	(a)	Number of CD's Sizes of CD Colour availability Ease of manufacture	4 x 1	4	
	(b)	All stages considered in detail and presented in correct order.	7-10		
		Most aspects considered in some detail and ordered.	4-6		
		Basic outline described.	0-3	10	
	(c)	Excellent sketching techniques shown. All details of the construction described. And one which would clearly work.	5-6		
		Sketching of a good standard. Suitable details of the construction shown. Would most likely work.	2-4		
		Basic sketching techniques used. Limited details of construction would probably not be successful.	0-1	6	20

8	(a)		Suitable hardwood named e.g. Teak, Iroko	1		
	(b)		Suitable adhesive – epoxy resin.	1	1	
	(c)		Excellent sketching techniques shown. All details of the method described.	4		
			Sketching of a good standard. Suitable details of the method shown	2-3		
			Basic sketching techniques used. Limited details of method.	0-1	4	
	(d)		Excellent sketching techniques shown. All stages covered and in order. Tools and machines identified.	6-8		
			Sketching of a good standard. Most stages identified and in reasonable order. Majority of tools and machines named.	3-5		
			Basic sketching techniques used. Only a few stages considered with limited knowledge of tools and equipment.	0-2	8	
	(e)		Excellent sketching techniques shown. Suitable method shown which would allow removal.	5-6		
			Sketching of a good standard. Sensible method shown which would probably allow removal.	3-4		
			Basic sketching techniques used. Idea would most likely be unsuccessful.	0-2	6	20
9	(a)	(i)	Some understanding shown 1 mark Good understanding shown 2 marks		2	
		(ii)	As for (i)		2	
		(iii)	As for (i)		2	
	(b)		Advantages identified up to 4 marks Detailed discussion up to 4 marks		8	
	(c)		Ergonomic data identified up to 3 marks Quality of explanation up to 3 marks		6	20
10	(a)		Appropriate situations identified 4 x 1		4	
	(b)		Suitable plastic 1 mark production method 1 mark		2	
	(c)		Detailed discussion related to given factors up to 3 x 3		9	
	(d)		Suitability of method up to 3 marks Quality of explanation up to 2 marks		5	20

11	(a)	(i)	Some understanding shown 1 mark Good understanding shown 2 marks	2	
		(ii)	As for (i)		
		(iii)	As for (i)	2	
	(b)		Appropriate method given 1 mark	1	
	(c)		Three safety hazards identified 3 x 1 Detailed discussion of hazards up to 3 x 2	9	
	(d)		Properties identified up to 2 marks Detailed discussion of why these properties make the material suitable for use in the manufacture of toys up to 2 marks.	4	20

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GCE A AND AS LEVEL

MARK SCHEME

MAXIMUM MARK: 120

SYLLABUS/COMPONENT: 9705/03

DESIGN AND TECHNOLOGY

Written 2

Section A

Part A – **Product Design**

1 **(a)** appropriate material including:
- aluminium
- acrylic / PVC 1

Reasons including:
- available / attractive
- easy to form 2 [3]

(b) description to include:
- appropriate method;
- marking;
- shaping;
- bending

quality of description:
- fully detailed 3 - 6
- some detail, 0 - 2

quality of sketches up to 2 [8]

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

quality of explanation:
- logical, structured 4 - 7
- limited detail, 0 - 3

quality of sketches up to 2 [9] [Total: 20]

2 discussion could include;

craftsperson
- product designed for client/unique
- hand quality/techniques/intricate detail
- select materials
- time no object
- costly

furniture company
- quantity production processes
- many similar items
- market research
- flat pack / transportation / storage

overall comprehension and interpretation 2

examination of issues up to 6 marks
- broad range 4 - 6
- limited 0 - 3

quality of explanation up to 8 marks
- detailed, logical 6 - 8
- some detail 3 - 5
- limited, 0 - 2

supporting examples / evidence up to 4 marks [Total: 20]

3 **(a)** description could include;
rotational moulding
- rotating mould
- plastic granules
- external heat applied

welding
- melt parent metal / join with similar filler metal
- gas or arc power supply
- correct safety precautions

turning between centres
- revolving centre / dog plate
- accuracy ensured / repeat turning

quality of description
- clear, logical, detailed 3 – 5
- limited detail, 0 – 2

quality of sketches 2

7 x 2 [14]

(b) situation 1
explanation 2 3 x 2 [6] [Total: 20]

Part B – **Practical Design**

4 **(a)** toughness – resistance to sudden impact 2
ductility – ability to be drawn into wire 2 [4]

(b) quality of description
- clear, logical, detailed 3 - 5
- limited detail, 0 - 2

details of samples 2
measurement 1
quality of sketches 2 [10]

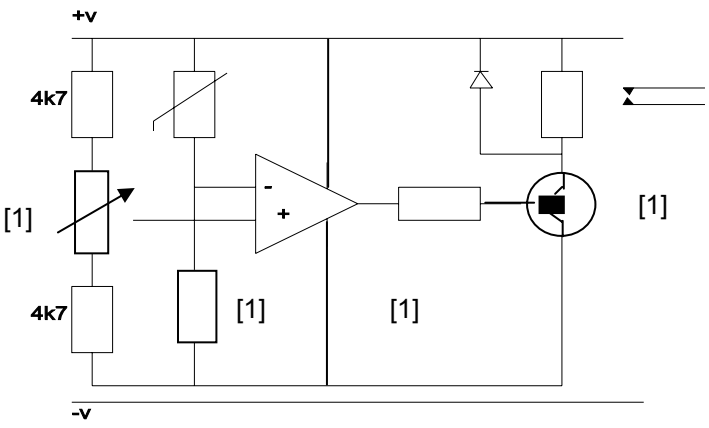
(c) explanation could include:
- selection of appropriate materials for particular function
- comparisons / cost effective

quality of explanation
- logical, detailed 3 - 5
- limited detail, 0 - 2

example/s 1 [6] [Total: 20]

5 **(a)** **(i)** control current/voltage in a circuit 2 [2]
(ii) colour codes 2
tolerance/wattage 2 [4]

(b)



[4]

(c) explanation could include;
strain gauge
strain sensor based on deformation that results in a change in resistance e.g. bridge/building structural checks
LDR
Light intensity affects resistance e.g. security systems

Quality of explanation	4		
Example	1	5 x 2	[10] [Total: 20]

6 **(a)** $\frac{52 \times 24}{9 \quad 10}$ 1

5.78 x 2.4 1

13.9 rotations 2 [4]

(b) for each
description 2
sketch 1

3 x 2 [6]

(c)

description of pneumatic method	1		
description of hydraulic method	1		
advantages of each	3 x 2		
example of each	1 x 2	[10]	[Total: 20]

Part C – **Graphic Products**

7 discussion could include;

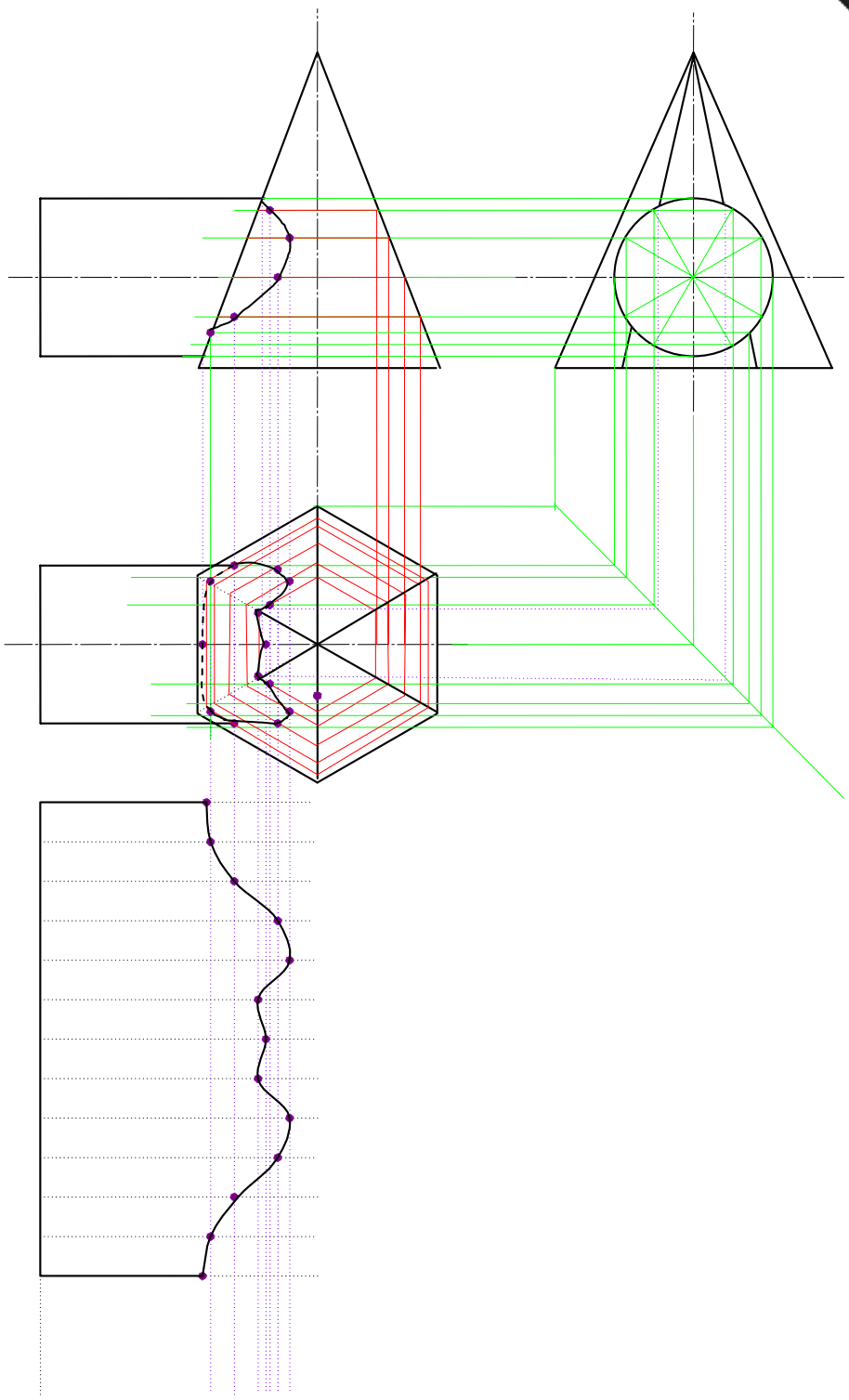
product
promotion
price
placement

comprehension and interpretation		2	
examination of issues		up to 6 marks	
- broad range	4 - 6		
- limited	0 - 3		
quality of explanation		up to 8 marks	
- detailed, logical	6 - 8		
- some detail	3 - 5		
- limited,	0 - 2		
supporting examples / evidence		4	[Total: 20]

8

correct isometric		3	
approx twice full size		2	
quality of linework		3	
overall shape / proportion		6	
rendering	polished plastic	3	
	matt texture	3	[Total; 20]

9



(a)	appropriate method	2		
	correct elevation	5		
	correct plan	5		
	accuracy	2	[14]	
(b)	appropriate method	2		
	accuracy	4	[6]	[Total: 20]