UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Advanced Subsidiary Level and GCE Advanced Level

MARK SCHEME for the October/November 2007 question paper

9705 DESIGN AND TECHNOLOGY

9705/03 Paper 3 (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.

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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) milling
Angle slot difficult to cut
Accurate/good finish

turning
Very good finish
Can be bored

calendering
Large sheets produced/cut to size
Even thickness

(3 x 2) [6]

[Total: 20]

2 (a) appropriate material including:
Aluminium/mild steel
acrylic
hardwood (1)

Reasons including:
takes a good finish/easy to form
easy to clean/attractive (2 x 1) [3]

(b) description to include:
appropriate method;
shaping, joining
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 jigs, formers, moulds;
simplification of design.
quality of explanation:
– logical, structured (4–7)
– limited detail (0–3)
quality of sketches (up to 2) [9]

[Total: 20]

3 Discussion could include:

(a) aesthetics
product attraction
colour/shape
fashion trends

examination of issues	(4)	
quality of explanation	(4)	
supporting examples/evidence	(2)	[10]

(b) marketing strategies
promotion/placement strategies
target market research
advertising strategies

examination of issues	(4)	
quality of explanation	(4)	
supporting examples/evidence	(2)	[10]

[Total: 20]

Part B – Practical Design

4 **(a)** **(i)** two alloys e.g.
steel
brass
bronze
duralumin (2 x 1) [2]

(ii) specific materials e.g.
steel – iron/carbon 0.3–1.2%
brass – copper 65% zinc 35%
bronze – copper 90%/tin 10%
duralumin – aluminium 95%/copper 4%/manganese 1%
(2 x 2) [4]

(iii) products (2 x 1)
Explanation (2 x 2) [6]

(b) **(i)** tensile test described (up to 4)
sketch (1) [5]

(ii) load extension graph described [3]

[Total: 20]

5 **(a)** **(i)** ability to be drawn into wire

(ii) e.g. Aluminium
Mild steel
Copper [1]

(iii) description of process
– fully detailed (3–5)
– some detail (0–2)

quality of sketches (up to 2) [7]

(b) understanding of gas welding (2)
understanding of electric welding (2)
comparisons/contrasts (4)
quality of sketches (2) [10]

[Total: 20]

6 **(a)** **(i)** total resistance $R = \frac{R1 \times R2}{R1 + R2}$ (1) = $\frac{36}{12}$ = 3 Ω (1) [2]

(ii) current in 1 resistor $V = IR$ (1) $2 = I \times 1$ $I = \frac{1}{2}$

$I = 0.5$ A (1) [2]

(iii) current in 6 resistor $I = 0.25$ A [2]

(b) output voltage

$V_{out} = \frac{R1}{R1 + R2} \times V$ (1) = $\frac{3}{3+6} \times 9 = \frac{27}{9}$ (1) = 3v (1) [3]

(c) **(i)** circuit to include:
relay for motor (1)
thermistor/heat sensor (1)
LED or indicator (1)
Symbols correct (2)
Circuit correct (1) [6]

description to include use of timer circuit
detailed description (3–5)
limited (0–2) [5]

[Total: 20]

Part C – Graphic Products

7 **(a)** **(i)** Fruit juice container – card (waxed), polyethylene, aluminium
Yoghurt pot – PVC (polyvinyl chloride) aluminium top, HIPS (High impact Polystyrene), PP (Polypropylene), PET (Polyethylene terephthalate)
Protective – expanded polystyrene
Blister pack – card/PE (polyethylene), PVC (polyvinyl chloride), PS (Polystyrene), PVDC (polyvinylidene chlorine)
(4 x 1) [4]

(ii) suitability of materials (2 x 3) [6]

(b) discussion could include:
speed of production
quality
rapid change

issues raised (4)
quality of discussion (4)
examples introduced (2) [10]

[Total: 20]

8 **(a)** correct isometric (2)
correct assembly (1)
frame/arcs (3)
thread (1)
position (1)
handle (2)
quality of linework (2) [12]

(b) correct isometric/exploded (6)
quality of linework (2) [8]

[Total: 20]

9 **(a)** design sketches (3)
Assembly details (2)
One sheet A4 (2)
Graphics (1) [8]

(b) clear description of manufacture [4]

(c) explanation could include:
change in process, press formes etc.;
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]