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

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UNIVERSITY of CAMBRIDGE
International Examinations

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 [2]

(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]