

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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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.

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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]

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- 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]**

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- 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 $R = \frac{R1 \times R2}{R1 + R2} (1) = \frac{36}{12} = 3 \Omega (1)$ [2]
- (ii) current in 1 resistor $V = IR (1) \quad 2 = I \times 1 \quad I = \frac{1}{2}$
 $I = 0.5 \text{ A} (1)$ [2]
- (iii) current in 6 resistor $I = 0.25 \text{ A}$ [2]

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

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Part C – Graphic Products

7	<p>(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)</p>	<p>(4 x 1) [4]</p>
	<p>(ii) suitability of materials</p>	<p>(2 x 3) [6]</p>
	<p>(b) discussion could include: speed of production quality rapid change</p>	
	<p>issues raised (4) quality of discussion (4) examples introduced (2)</p>	<p>[10]</p>
[Total: 20]		
8	<p>(a) correct isometric (2) correct assembly (1) frame/arcs (3) thread (1) position (1) handle (2) quality of linework (2)</p>	<p>[12]</p>
	<p>(b) correct isometric/exploded (6) quality of linework (2)</p>	<p>[8]</p>
[Total: 20]		
9	<p>(a) design sketches (3) Assembly details (2) One sheet A4 (2) Graphics (1)</p>	<p>[8]</p>
	<p>(b) clear description of manufacture</p>	<p>[4]</p>
	<p>(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)</p>	<p>[8]</p>
[Total: 20]		