

**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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### Section A

#### Part A – Product Design

<b>1</b>	<b>(a)</b> description of process		
	– fully detailed	(3–5)	
	– some detail	(0–2)	
	quality of sketches	(up to 2) (7 x 2)	[14]
	<b>(b)</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]
			<b>[Total: 20]</b>
<b>2</b>	<b>(a)</b> 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>(b)</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]
	<b>(c)</b> 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]
			<b>[Total: 20]</b>

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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 [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  $R = \frac{R1 \times R2}{R1 + R2} (1) = \frac{36}{12} = 3 \Omega (1)$  [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	(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 quality of discussion examples introduced	(4) (4) (2)	[10]
				<b>[Total: 20]</b>
8	(a)	correct isometric correct assembly frame/arcs thread position handle quality of linework	(2) (1) (3) (1) (1) (2) (2)	[12]
	(b)	correct isometric/exploded quality of linework	(6) (2)	[8]
				<b>[Total: 20]</b>
9	(a)	design sketches Assembly details One sheet A4 Graphics	(3) (2) (2) (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 – limited detail quality of sketches	(4–6) (0–3) (up to 2)	[8]
				<b>[Total: 20]</b>