

### **Cambridge Assessment International Education**

Cambridge International Advanced Level

#### **DESIGN AND TECHNOLOGY**

9705/32

Paper 3

October/November 2017

MARK SCHEME
Maximum Mark: 120

### **Published**

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### Section A

## Part A - Product Design

Question	Answer	Marks
1(a)	$\begin{array}{c} \text{description of process:} \\ \text{fully detailed, most stages covered} & 3-5 \\ \text{some detail} & 0-2 \\ \text{quality of sketches} & \text{up to 2} \\ 7\times2 \end{array}$	14
1(b)	annealing reduces damage caused by hardness/brittleness easier to work bowl very quick operation  extrusion accurate section cost effective for long lengths single process/no finishing required  mortice and tenon joint strong joint good gluing area stopped tenon does not affect appearance	6
	3 × 2	

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Question	Answer		Marks
2(a)	suitable material:	1 mark	3
	trough abs/polypropylene/HDPE appropriate hardwood for laminating / bending, accept pine aluminium alloy, brass. copper mild steel (with finish) stainless steel		
	Reasons : will not react to moisture can be bent to required shape will hold shape when full look attractive in desired environment		
	foot abs/polypropylene/HDPE appropriate hardwood cast iron(with finish)/aluminium alloy/brass		
	Reasons:     can be cast to shape (metals)     can be moulded to shape (polymers)     can support the trough easily     accepts finish to match trough	2 × 1	
2(b)	quality of description: fully detailed some detail quality of sketches	3–7 0–2 up to 2	9
2(c)	explanation could include:     change in process;     change in materials;     use of jigs, formers, moulds;     simplification of design.		8
	quality of explanation: logical, structured limited detail quality of sketches	4–6 0–3 up to 2	

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Question	Answer		Marks
3(a)	plastic dip coating; Appropriate product e.g. bathroom rail, kitchen rack Appropriate materials e.g. Mild steel, LDPE, Nylon Reason e.g. humid, damp (bathroom/kitchen/outdoor)  anodising; Appropriate product e.g. building cladding, screws Appropriate materials e.g. Aluminium, magnesium, titanium, steel Reason e.g. outdoor, to identify part, attractiveness  varnishing; Appropriate product e.g. building cladding, screws Appropriate materials e.g. Aluminium, magnesium, titanium, steel Reason e.g. outdoor, to identify part, attractiveness	1 1 1 1 1 1 3 × 2	6
3(b)	quality of description: fully detailed, most stages covered some detail quality of communication	3–5 0–2 up to 2 7 × 2	14

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## Part B – Practical Technology

Question	Answer	Marks
4(a)	50 N evidence of correct working 1, correct answer 2	2
4(b)(i)	A cast iron 1 reason 1 B mild steel 1 reason 1 C aluminium alloy 1 reason 1	6
4(b)(ii)	Ultimate strength 1 Maximum stress 1 Fracture point 1 Breaking point reached 1 Elastic limit 1 Will not return to original shape 1	6
4(c)	explanation could include:  Wear materials friction reduction  Corrosion protection materials  clear, fully detailed 4–6 limited detail 4–6	6

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specific product:  MDF e.g. Furniture, building cladding Phenol e.g. Electrical products zinc e.g. Castings, galvanising, in alloy, brass, bearings HDPE e.g. Heavy duty bags, toys Bronze e.g. Castings, sculptures polystyrene e.g. Food packaging, buoyancy aids copper e.g. Pipes, electric wire stainless steel polyurethane e.g. Varnish, paint, foam, upholstery teak e.g. furniture		5
Accept any other appropriate application	1 × 5	
MDF e.g. Dimensionally stable, large sheet Phenol e.g. Heat/electricity resistant, hard, rigid zinc e.g. Brittle, casts well HDPE e.g. Range of colours, easily moulded, resists impact Bronze e.g. Corrosion resistant, attractive polystyrene e.g. Sheet or expanded, electrical resistance copper e.g. Ductile, malleable, conducts heat and electricity stainless steel polyurethane e.g. Weather resistant, resists tearing teak e.g. Very attractive, oils make it weather resistant  Accept any other appropriate property		15
N F Z H E F C S F T T	MDF Phenol Pheno	MDF e.g. Dimensionally stable, large sheet e.g. Heat/electricity resistant, hard, rigid e.g. Brittle, casts well e.g. Range of colours, easily moulded, resists impact e.g. Corrosion resistant, attractive e.g. Sheet or expanded, electrical resistance e.g. Ductile, malleable, conducts heat and electricity estainless steel e.g. Corrosion resistant, hard, high polished finish e.g. Weather resistant, resists tearing e.g. Very attractive, oils make it weather resistant

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Question	Answer	Marks
6(a)	applications described e.g. CNC Router, miller, lathe 2 × 2	4
6(b)	explanation could include:	
6(b)(i)	manufacturer speed of production quality control cost implications  clear, fully detailed most features described limited detail  6–8 4–5 0–3	8
6(b)(ii)	customer cost reliability quality  clear, fully detailed most features described limited detail  customer 6–8 4–5 0–3	8

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## Part C - Graphic Products

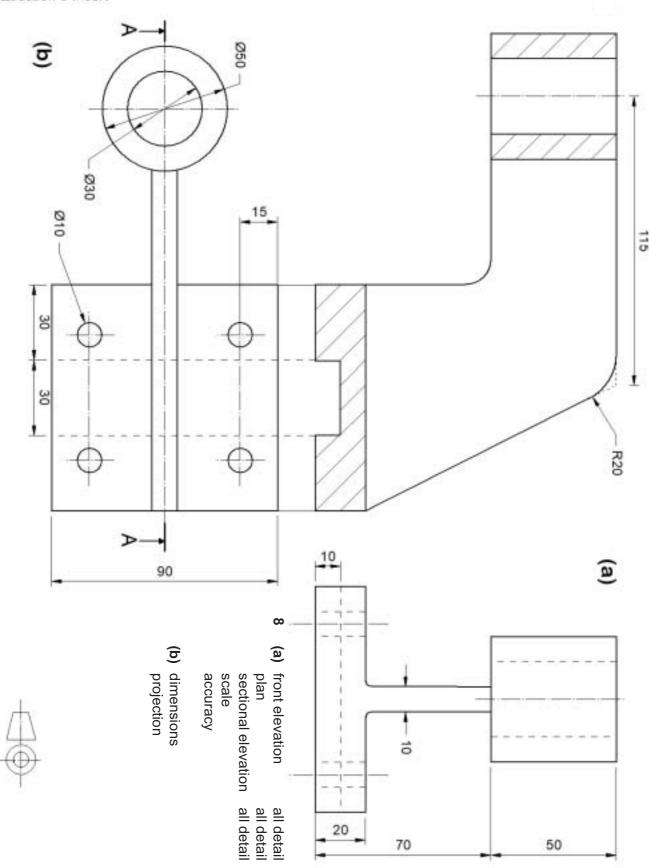
Question		Answer	Marks
7	scale	1	20
	Cabinet	2	
	Sink unit	3	
	Window	2	
	Mirror	2	
	Shower tray	2	
	Bath	3	
	Layout	2	
	Accuracy	3	

Question			Answer	Marks
8(a)	front elevation plan sectional elevation scale accuracy	all detail all detail all detail	4 4 4 1 3	16
8(b)	dimensions projection		2 2	4

Question	Answer	Marks
9	Discussion could include: target market affordability / quality sale introductory offers market accessibility	20
	examples / evidence could be teenage / adult market specific placement promotions – celebrities, BOGOF	
	examination of issues wide range of relevant issues limited range  4–8 0–3	
	quality of explanation logical, structured 4–8 limited detail 0–3	
	supporting examples / evidence 4	

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### Question 8 Insert



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### Section B

Question	Answer		Marks
	Analysis		80
	Analysis of the given situation/problem	0–5	
	Specification		
	Detailed written specification of the design requirements. At least five specification points other than those given in the question.	0–5	
	Exploration		
	Bold sketches and brief notes to show exploration of ideas for a design solution, with reasons for selection.		
	range of ideas	0–5	
	annotation related to specification	0–5	
	marketability, innovation	0–5	
	evaluation of ideas, selection leading to development	0–5	
	communication	0–5	
	Development		
	Bold sketches and notes showing the development, reasoning and composition of ideas into a single design proposal. Details of materials, constructional and other relevant technical details.		
	developments	0–5	
	reasoning	0–5	
	materials	0–3	
	constructional detail	0–7	
	communication	0–5	
	Proposed solution		
	Produce drawing/s of an appropriate kind to show the complete solution proposed solution details/dimensions	n. 0–10 0–5	
	Evaluation		
	Written evaluation of the final design solution	0–5	

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