Cambridge International A Level

Cambridge Assessment International Education
Cambridge International Advanced Level

DESIGN AND TECHNOLOGY **9705/32**

Paper 3 **October/November 2017**

MARK SCHEME

Maximum Mark: 120

Published

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, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

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Section A

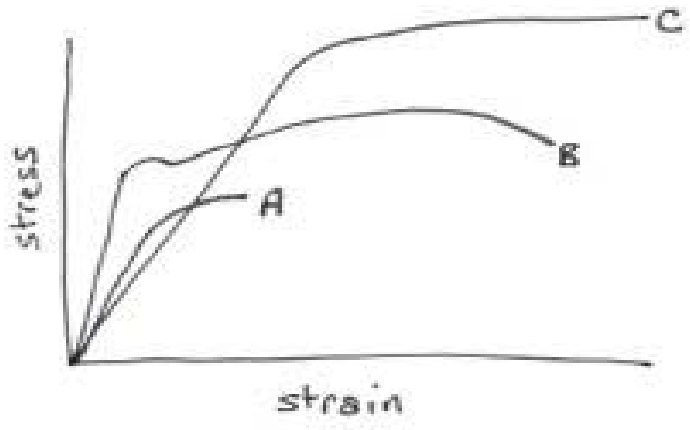
Part A – Product Design

Question	Answer	Marks
1(a)	description of process: fully detailed, most stages covered 3–5 some detail 0–2 quality of sketches up to 2 7 × 2	**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 3 × 2	**6**

Question	Answer	Marks
2(a)	suitable material: 1 mark 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	**3**
2(b)	quality of description: fully detailed 3–7 some detail 0–2 quality of sketches up to 2	**9**
2(c)	explanation could include: change in process; change in materials; 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**

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

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 0–3	**6**

Question	Answer	Marks
5(a)	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 e.g. Pans, sinks, cutlery polyurethane e.g. Varnish, paint, foam, upholstery teak e.g. furniture Accept any other appropriate application 1 × 5	**5**
5(b)	appropriate properties related to product 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 e.g. Corrosion resistant, hard, high polished finish polyurethane e.g. Weather resistant, resists tearing teak e.g. Very attractive, oils make it weather resistant Accept any other appropriate property Explanation of suitability up to 3 3 × 5	**15**

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 6–8 most features described 4–5 limited detail 0–3	**8**
6(b)(ii)	customer cost reliability quality clear, fully detailed 6–8 most features described 4–5 limited detail 0–3	**8**

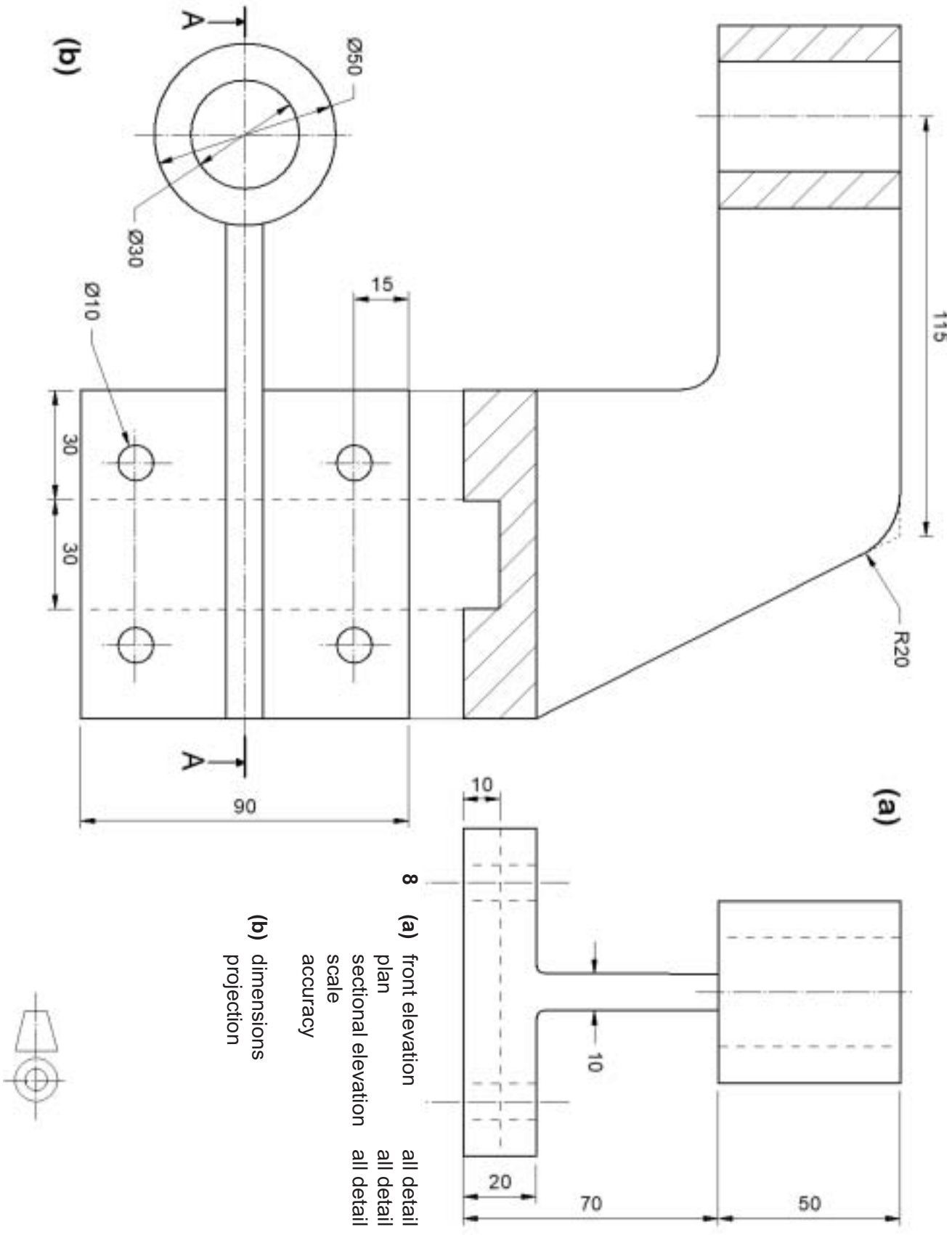
Part C – Graphic Products

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

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

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

Question 8 Insert



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

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 0–10 details/dimensions 0–5	
	Evaluation	
	Written evaluation of the final design solution 0–5	