

**MARK SCHEME for the October/November 2010 question paper  
for the guidance of teachers**

**9705 DESIGN AND TECHNOLOGY**

**9705/33**

Paper 3, maximum raw mark 120

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.

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**Section A**

**Part A – Product Design**

- 1 (a)** Description of process
- some detail (0–2)
  - fully detailed (3–5)
- Quality of sketches (up to 2) [7 × 2]
- (b)** Injection moulding
- quality finish
  - quantity production
  - complex hollow shape formed in one piece
  - little wastage/recycle any waste
- Turning
- cylindrical shape
  - high quality finish
  - boring and shaping function
- Pressing
- even grain structure
  - speed
  - no wastage [3 × 2]

**[Total: 20]**

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- 2 (a) Appropriate material including:
- solid wood – named appropriate hard or softwood
  - mdf
  - veneered/laminated chipboard (1)
- Reasons including:
- takes a good finish
  - good aesthetic qualities,
  - stable
  - easy to process (2 × 1) [3]
- (b) Description to include:
- appropriate method;
  - joining, permanent, KD
  - carcass, back and shelf
  - finishing including edges
- Quality of description:
- some detail (0–2)
  - fully detailed (3–7)
- Quality of sketches (up to 2) [9]
- (c) Explanation could include:
- change in process;
  - change in materials;
  - use of jigs, formers, moulds;
  - simplification of design.
- Quality of explanation:
- limited detail (0–3)
  - logical, structured (4–6)
- Quality of sketches (up to 2) [8]
- [Total: 20]**
- 3 (a) Materials
- quality of explanation (up to 3)
  - specific material detail (up to 5)
  - examples e.g. aluminium cricket bats  
carbon/graphite tennis racquets/fishing rods  
skis  
surfboards (up to 2) [10]
- Manufacturing technologies
- quality of explanation (up to 3)
  - specific manufacturing detail (up to 5)
  - examples e.g. alloying/reinforcement processes  
grp/composite layup  
lamination (up to 2) [10]
- [Total: 20]**

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### Part B – Practical Technology

- 4 Mechanisms could be
- crank and slider,
  - rack and pinion,
  - cam and follower
  - screwthreads
- (1)
- Quality of description including sketches
- (3)
- Examples e.g. car engine, drill, car jack, vice
- (1) [4 × 5]
- [Total: 20]**
- 
- 5 (a) Output voltage  $\frac{9 \times 10}{12 + 10}$
- (1)
- = 4.1 V
- (2) [3]
- 
- (b) Quality of description
- limited detail
  - fully detailed (using resistors/capacitors, 555 timer)
- (0–2)
- (3–5) [5]
- 
- (c) Discussion could include:
- Manufacturer
- wider range of products
  - keeping up with technology
  - reducing lead time
- Consumer
- more choice –
  - peer pressure – got to have products
  - quality of life – efficiency/reliability of products
- Examples/evidence could be
- mobile phones
  - cameras,
  - computers
  - hand held games
- Examination of issues
- (5)
- Quality of explanation
- (5)
- Supporting examples/evidence
- (2) [12]
- [Total: 20]**

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- 6 (a) (i) Prepare steel for brazing/welding  
 Consider health and safety/protective clothing  
 Flux/clean  
 Position in hearth  
 Set flame/apply heat  
 Apply spelter/rod  
 Allow to cool, clean up
- (ii) Wire wool/prepare/clean pcb  
 Insert resistor  
 Flux or use flux core solder  
 Consider health and safety/fumes  
 Heat at joint with soldering iron  
 Apply solder – remove solder  
 Remove iron
- Quality of description:
- some detail (0–2)
  - fully detailed (3–4)
- Quality of sketches (up to 2) (6 × 2) [12]
- (b) Quality of explanation
- some detail (0–3)
  - fully detailed (4–6)
- Appropriate examples e.g. various coatings, selective materials (2) [8]

**[Total: 20]**

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### Part C – Graphic Products

7	(a) Correct front elevation		[4]
	(b) Main development construction	(4)	
	Top	(2)	
	Joining	(2)	
	Accuracy/line quality	(2)	[10]
	(c) Quality of explanation		
	• some detail	(0–2)	
	• fully detailed	(3–4)	
	Comparisons	(2)	[6]
			<b>[Total: 20]</b>
8	Discussion could include:		
	• feasibility/safety testing		
	• architects – how buildings fit in with environment, walk through tests,		
	• product designers – developing ideas, presenting to clients, testing function		
	• engineers – safety testing, performance testing		
	Examples/evidence could be		
	• town planning models,		
	• vehicle testing		
	• consumer/user trialling		
	Examination of issues		
	• limited range	(0–3)	
	• wide range of relevant issues	(4–8)	
	Quality of explanation		
	• limited detail	(0–3)	
	• logical, structured	(4–8)	
	Supporting examples/evidence	(4)	
			<b>[Total: 20]</b>
9	(a) Construction	(3)	
	Loci	(2)	
	Accuracy	(3)	[8]
	(b) Quality of description		
	• limited detail	(0–2)	
	• some detail, main functions covered	(3–6)	
	• fully detailed including constructions and materials	(7–10)	[12]
	Quality of sketching	(2)	
			<b>[Total: 20]</b>