

DESIGN AND TECHNOLOGY

9705/31 October/November 2017

Paper 3 MARK SCHEME

Maximum Mark: 120

Published

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Section A

Part A – Product Design

Question	Answer		Marks
1	appropriate example	1 × 4	20
	2D modelling ; 3D modelling ; Mock up ; Scale prototype ; for each;	computer modelling, exploring shape, card exploring form, proportion scaled model of part/whole of concept, possibility usually final design model, can be tested	
	quality of explanation:		
	logical, structuredlimited detail	3-4 0-2 4 × 4	

Question	Answer			Marks
2(a)	suitable material:			3
	abs/polypropylene/HDPE appropriate hardwood e.g. beech	1		
	Reason :			
	 robust/take harsh treatment can be assembled/formed to required shape not split easy 			
	 take a good finish 		1 × 2	
2(b)	description to include:			10
	quality of description:			
	 fully detailed 	6–8		
	 most stages 	3–5		
	– some detail,	0-2		
	quality of sketches	up to 2		
2(c)	explanation could include:			7
	 change in process; 			
	– change in materials;			
	 use of jigs, formers, moulds; 			
	 simplification of design. 			
	quality of explanation:			
	 logical, structured 	3–5		
	 limited detail, 	0–2		
	quality of sketches	up to 2		

Question	Answer	Marks
3(a)	description of process	14
	- fully detailed3–5- some detail,0–2quality of sketchesup to 27 × 2	
3(b)	milling – V and slot cuts – quality finish – easy machine set up, change cutter laminating – solid, strong structure – some give/flexibility – low waste/environmentally friendlier	6
	compression moulded-range of colours-suitable for thermosetting plastic-limited finishing required 3×2	

Part B – Practical Technology

Question	Answer	Marks
4(a)(i)	$P = VI \qquad 12 \times 2.4 \tag{1}$	3
	28.8 (1) Watts (1)	
4(a)(ii)	Battery Mains supply Dynamo	4
	Photovoltaic 1×2 Why used e.g. location, safety 1×2	
4(b)(i)	AbuzzerBreed switchCthyristor1 × 3	3
4(b)(ii)	Α	10
	$\begin{array}{c} \textbf{B}\\ \textbf{2.2k\Omega}\\ \textbf{Pv}\\ \textbf{I}\\ \textbf{M\Omega}\\ \textbf{M}\\ \textbf{M}\\$	

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Question	Answer		Marks	
5	Discussion could include:			20
	 computer functions in designing accuracy, ability to change, share, forward comment on creative capacity/response to 			
	examination of issues			
	wide range of relevant issueslimited range	5–9 0–4		
	quality of explanation			
	logical, structuredlimited detail,	4–7 0–3	16	
	supporting examples/evidence			
	 specific programmes/usage specific use architecture/engineering 		4	

Question	Answer	Marks
6(a)	resultant 11.1 N	4
	Direction and magnitude3Resultant1	
6(b)	RL 4,2 N 1 RR 5.8 N 1	2
6(c)	correct notation1Load diagram3Transfer to main diagram3Strut/ties4Accuracy3	14

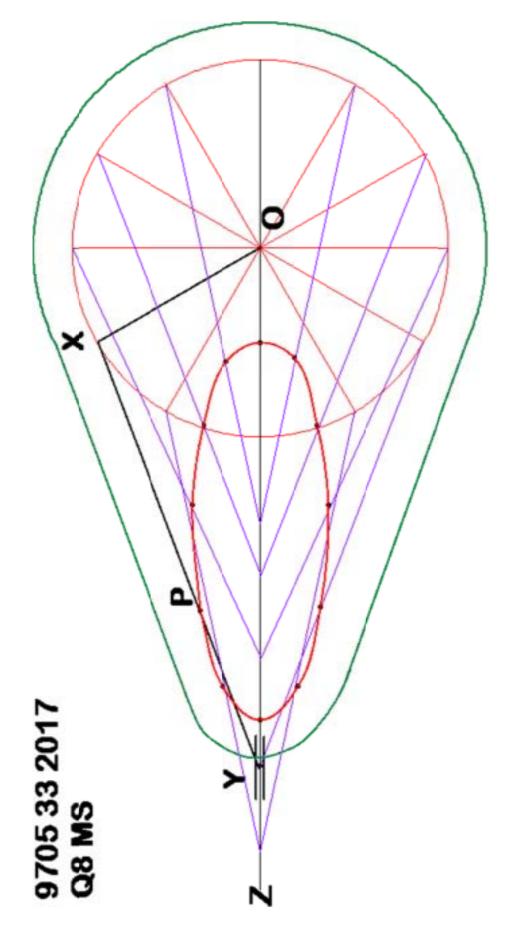
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Question	Answer		Marks
7(a)	 (i) cashaft diameter 24 (ii) in line flat follower (iii) minimum distance of 24 from the flat follower to camshaft centre (iv) clockwise direction (v) 0°-180° rise 30 simple harmonic motion (vi) 180°-210 dwell (vii) 210-360° fall with simple harmonic motion Accuracy 	1 1 1 1 4 2 3 2	15
7(b)	ratchet described, pawl identified Example	4 1	5

Question	Answer		Marks
8(a)(i)	size/scale Circle divided (angular or trammel) Loci plotted Accuracy	2 1 3 2	8
8(a)(ii)	accurate guard profile	up to 4	4
8(b)	isometric Exploded parts in line Accuracy rendering	2 3 3	8

Question	Answer			Marks
9	Discussion could include:			20
	 materials (e.g. smart) printing technologies virtual reality 			
	examination of issues			
	wide range of relevant issueslimited range	5–9 0–4		
	quality of explanation			
	logical, structuredlimited detail,	4–7 0–3	16	
	supporting examples / evidence			
	 specific CAD/Internet/simulation VR etc. progra specific printing/manufacturing technologies specific consumer/manufacturer examples 	ammes/usage	4	
	- specific consumer/manufacturer examples		4	

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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 annotation related to specification marketability, innovation evaluation of ideas, selection leading to development communication 	0–5 0–5 0–5 0–5 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 reasoning materials constructional detail communication 	0–5 0–5 0–3 0–7 0–5	
	Proposed solution		
	Produce drawing/s of an appropriate kind to show the complete solution	ı.	
	 proposed solution details/dimensions 	0—10 0—5	
	Evaluation		
	Written evaluation of the final design solution.	0–5	