
DESIGN AND TECHNOLOGY

9705/33

Paper 3

October/November 2017

MARK SCHEME

Maximum Mark: 120

Published

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This document consists of **8** printed pages.

Section A

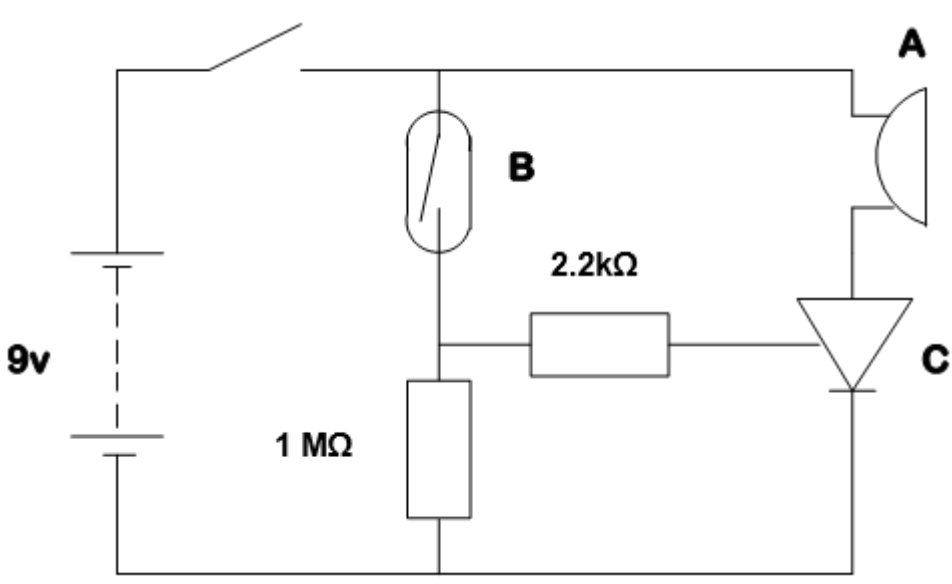
Part A – Product Design

Question	Answer	Marks
1	<p>appropriate example</p> <p>2D modelling ; 3D modelling ; Mock up ; Scale prototype ;</p> <p>computer modelling, exploring shape, card exploring form, proportion scaled model of part/whole of concept, possibility usually final design model, can be tested</p> <p>for each; quality of explanation:</p> <ul style="list-style-type: none"> – logical, structured – limited detail 	<p>1 · 4</p> <p>20</p> <p>3–4 0–2</p> <p>4 · 4</p>

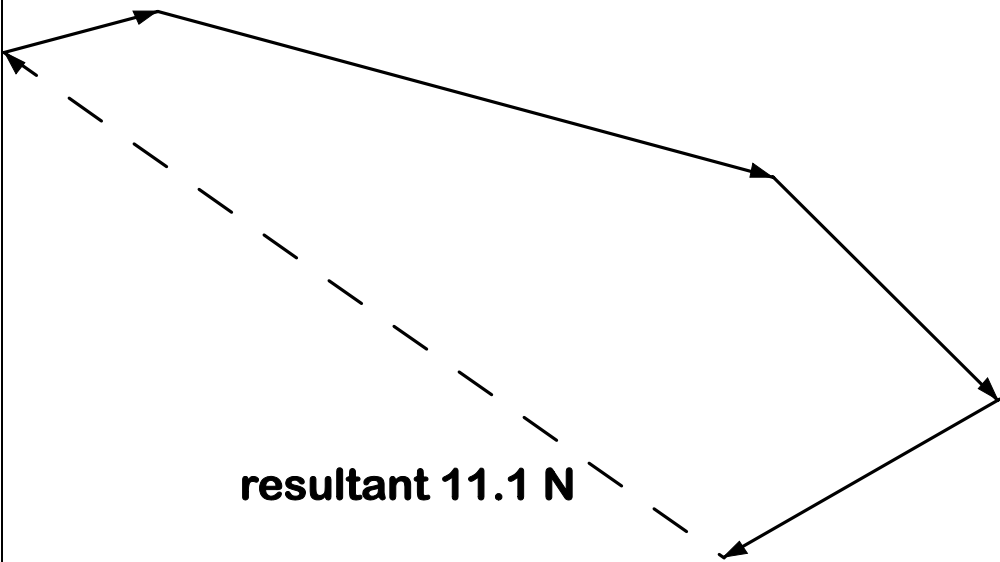
Question	Answer	Marks
2(a)	<p>suitable material:</p> <p>abs/polypropylene/HDPE appropriate hardwood e.g. beech</p> <p>Reason :</p> <ul style="list-style-type: none"> – robust/take harsh treatment – can be assembled/formed to required shape – not split easy – take a good finish 	<p>1</p> <p>1 · 2</p> <p>3</p>
2(b)	<p>description to include:</p> <p>quality of description:</p> <ul style="list-style-type: none"> – fully detailed – most stages – some detail, <p>quality of sketches</p>	<p>6–8 3–5 0–2 up to 2</p> <p>10</p>
2(c)	<p>explanation could include:</p> <ul style="list-style-type: none"> – change in process; – change in materials; – use of jigs, formers, moulds; – simplification of design. <p>quality of explanation:</p> <ul style="list-style-type: none"> – logical, structured – limited detail, <p>quality of sketches</p>	<p>3–5 0–2 up to 2</p> <p>7</p>

Question	Answer	Marks
3(a)	description of process – fully detailed – some detail, quality of sketches	14 3–5 0–2 up to 2 7 · 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 compression moulded – range of colours – suitable for thermosetting plastic – limited finishing required	6 3 · 2

Part B – Practical Technology

Question	Answer	Marks
4(a)(i)	$P = VI$ $12 \cdot 2.4$ (1) 28.8 (1) Watts (1)	3
4(a)(ii)	Battery Mains supply Dynamo Photovoltaic Why used e.g. location, safety	1 · 2 1 · 2 4
4(b)(i)	A buzzer B reed switch C thyristor	1 · 3 3
4(b)(ii)	 <p>switch sets alarm (1) Alarm activated when reed switch closes (1) – magnet on door frame – (1) Current flows to gate leg of thyristor (1) causing it to switch on (1) Circuit complete (1) Buzzer sounds (1) Thyristor latching device – will stay on (1) until switched off by top switch.</p> <p>Clarity of communication (up to 2)</p>	10

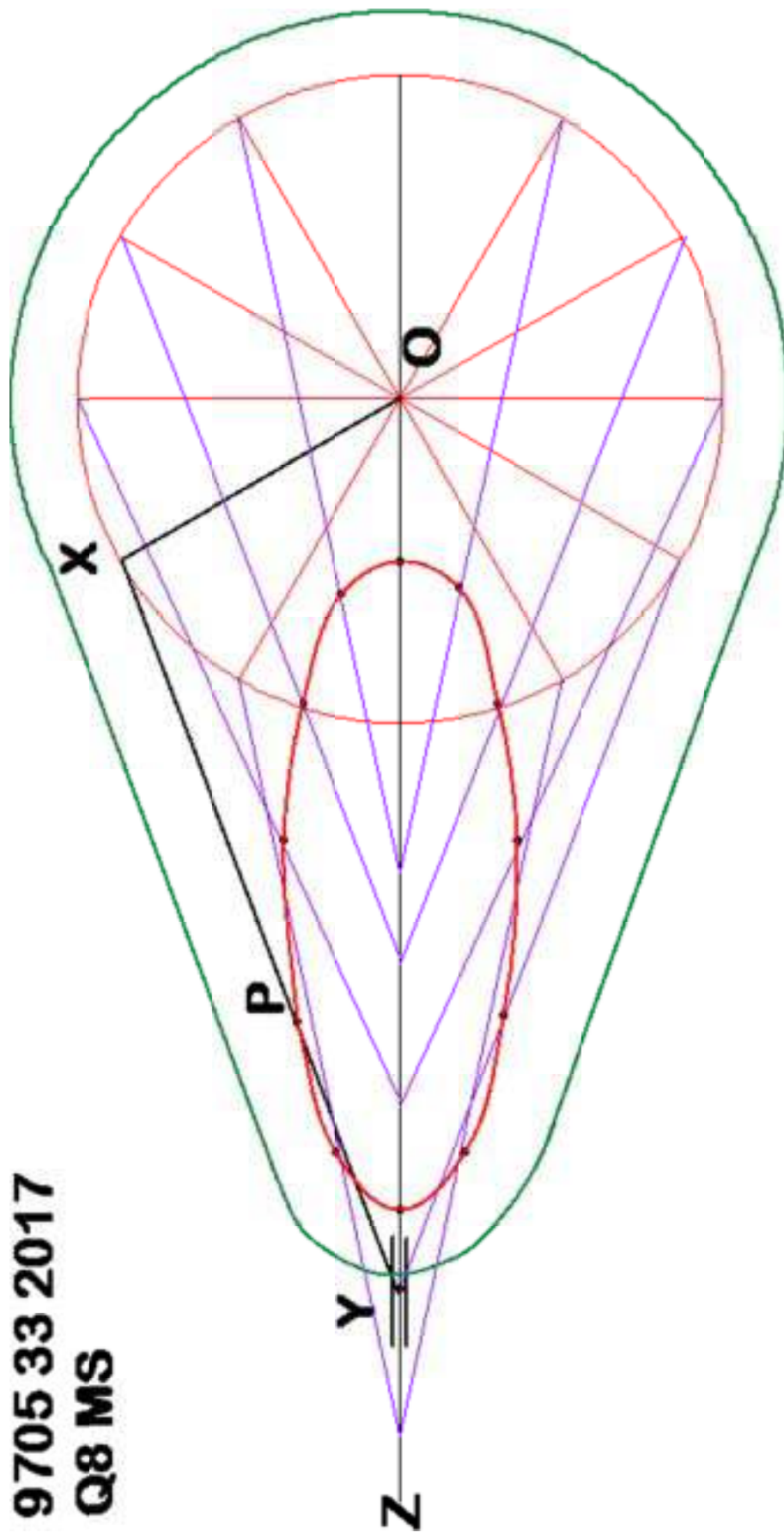
Question	Answer	Marks
5	<p>Discussion could include:</p> <ul style="list-style-type: none"> – computer functions in designing – accuracy, ability to change, share, forward to CAM – comment on creative capacity/response to quote <p>examination of issues</p> <ul style="list-style-type: none"> – wide range of relevant issues 5–9 – limited range 0–4 <p>quality of explanation</p> <ul style="list-style-type: none"> – logical, structured 4–7 – limited detail, 0–3 <p>supporting examples/evidence</p> <ul style="list-style-type: none"> – specific programmes/usage – specific use architecture/engineering 	<p>20</p> <p>16</p> <p>4</p>

Question	Answer	Marks
6(a)	 <p style="text-align: center;">resultant 11.1 N</p> <p>Direction and magnitude 3 Resultant 1</p>	4
6(b)	<p>RL 4,2 N 1 RR 5.8 N 1</p>	2
6(c)	<p>correct notation 1 Load diagram 3 Transfer to main diagram 3 Strut/ties 4 Accuracy 3</p>	14

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: – materials (e.g. smart) – printing technologies – virtual reality examination of issues – wide range of relevant issues – limited range quality of explanation – logical, structured – limited detail, supporting examples / evidence – specific CAD/Internet/simulation VR etc. programmes/usage – specific printing/manufacturing technologies – specific consumer/manufacturer examples	5–9 0–4 4–7 0–3 16 4	20



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Q8 MS

Section B

Question	Answer	Marks
	<p>Analysis</p> <p>Analysis of the given situation/problem. 0–5</p> <p>Specification</p> <p>Detailed written specification of the design requirements. At least five specification points other than those given in the question 0–5</p> <p>Exploration</p> <p>Bold sketches and brief notes to show exploration of ideas for a design solution, with reasons for selection.</p> <ul style="list-style-type: none"> – 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 <p>Development</p> <p>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.</p> <ul style="list-style-type: none"> – developments 0–5 – reasoning 0–5 – materials 0–3 – constructional detail 0–7 – communication 0–5 <p>Proposed solution</p> <p>Produce drawing/s of an appropriate kind to show the complete solution.</p> <ul style="list-style-type: none"> – proposed solution 0–10 – details/dimensions 0–5 <p>Evaluation</p> <p>Written evaluation of the final design solution. 0–5</p>	80