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**DESIGN AND TECHNOLOGY**

**0445/12**

Paper 1 Product Design

**October/November 2019**

MARK SCHEME

Maximum Mark: 50

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**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.

Cambridge International will not enter into discussions about these mark schemes.

Cambridge International is publishing the mark schemes for the October/November 2019 series for most Cambridge IGCSE™, Cambridge International A and AS Level components and some Cambridge O Level components.

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This document consists of **4** printed pages.

**Generic Marking Principles**

These general marking principles must be applied by all examiners when marking candidate answers. They should be applied alongside the specific content of the mark scheme or generic level descriptors for a question. Each question paper and mark scheme will also comply with these marking principles.

**GENERIC MARKING PRINCIPLE 1:**

Marks must be awarded in line with:

- the specific content of the mark scheme or the generic level descriptors for the question
- the specific skills defined in the mark scheme or in the generic level descriptors for the question
- the standard of response required by a candidate as exemplified by the standardisation scripts.

**GENERIC MARKING PRINCIPLE 2:**

Marks awarded are always **whole marks** (not half marks, or other fractions).

**GENERIC MARKING PRINCIPLE 3:**

Marks must be awarded **positively**:

- marks are awarded for correct/valid answers, as defined in the mark scheme. However, credit is given for valid answers which go beyond the scope of the syllabus and mark scheme, referring to your Team Leader as appropriate
- marks are awarded when candidates clearly demonstrate what they know and can do
- marks are not deducted for errors
- marks are not deducted for omissions
- answers should only be judged on the quality of spelling, punctuation and grammar when these features are specifically assessed by the question as indicated by the mark scheme. The meaning, however, should be unambiguous.

**GENERIC MARKING PRINCIPLE 4:**

Rules must be applied consistently e.g. in situations where candidates have not followed instructions or in the application of generic level descriptors.

**GENERIC MARKING PRINCIPLE 5:**

Marks should be awarded using the full range of marks defined in the mark scheme for the question (however; the use of the full mark range may be limited according to the quality of the candidate responses seen).

**GENERIC MARKING PRINCIPLE 6:**

Marks awarded are based solely on the requirements as defined in the mark scheme. Marks should not be awarded with grade thresholds or grade descriptors in mind.

Question	Answer	Marks
1(a)	Accept any <b>four</b> additional suitable points – ease of access, security aspects, easy to carry, appropriate materials for display, method of fixing each watch, method of display e.g. case ranked in size or at different levels. AOVR No repeats of question	4 1 × 4
1(b)	Close fitting profile made from various materials, which hold watches in place. Perspex, glass or any other transparent sheet material. Protecting from damage. Bubble shaped acrylic covers. Individual compartments with framed sheet plastic sheets. Other methods using plastic sheet materials glued together. Security methods including alarms, retained watches with wire or chain. Hinged locked lid, sliding lid with pin system for security. AOVR	4 2 × 2

Question	Answer	Marks
2(a)	Accept any <b>four</b> additional suitable points – method of construction using card or other light material, consideration of weight or thickness of card, overall shape and aesthetics of counter top display, methods to demonstrate water resistance, possibly including water to demonstrate water resistance, details of possible methods to promote watches. AOVR No repeats of question	4 1 × 4
2(b)	Accept drawings of any <b>two</b> methods of making card water resistant – plastic sheet liner, laminating card, water resistant film, accept using acrylic sheet as a liner, wax-dip process on manufacture card water container, hydrostatic spray. AOVR	4 2 × 2

Question	Answer	Marks
3(a)	Accept any <b>four</b> additional suitable points: easy to operate, small – appropriate to size of watch, quiet or silent in use, source of movement e.g. battery, motor, style in keeping with watch, reference to power source. AOVR No repeats of question.	4 1 × 4
3(b)	Accept drawings of any <b>two</b> methods including – stepper motor, crank and pin, crank and slider, pendulum, electric motor, rack and pinion, electronics to control polarity. AOVR	4 2 × 2

Question	Answer	Marks
1, 2 and 3(c)	Any suitable ideas. At least <b>three different</b> ideas for maximum marks. Pro rata if fewer.	<b>6</b>
	<p><b>Communication</b> Simple drawings displaying a low standard or limited range of techniques. 0–2 Clear drawings displaying a good standard and a range of techniques – shading, colour, annotation. 3–4 High quality drawings using a wide range of techniques with clear annotation and detail. 5–6</p>	
1, 2 and 3(d)	<p><b>Suitability</b> Simplistic designs showing outlines only. 0–2 Rather more detail, sensible solutions that could work. 3–4 Accurate solutions, good fitness for purpose, construction detail. 5–6</p>	<b>6</b>
	Evaluation of each of the ideas. At least 3 evaluations up to 2 marks each.	<b>6</b>
	Selection and justification. 1 + 1	<b>2</b>
1, 2 and 3(e)	<p><b>Quality of drawing</b> Poor line quality, proportions, little detail 1 Good line work, use of colour, proportions, some detail. 2–3 High standard throughout with a range of techniques that show clearly all detail. 4</p>	<b>4</b>
	<p><b>Dimensions</b> 2 or 3 overall dimensions only 1 Additional detail dimensions 1</p>	<b>2</b>
	<p><b>Construction detail</b> A simplistic approach showing little or no detail of construction to be used. 0–2 Most construction detail may be obvious from overall views or from some annotation. 3–4 All construction detail will be clear with good annotation and additional detail drawings as necessary. 5–6</p>	<b>6</b>
1, 2 and 3(f)	Suitable <b>specific</b> materials stated. 1 + 1	<b>4</b>
	Appropriate reasons for choice. 1 + 1	
1, 2 and 3(g)	Suitable method described. 1	<b>6</b>
	Good detailed description of: processes 0–3 tools 0–2	