

Markscheme

May 2026

Design technology

Higher level and standard level

Paper 2

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General Marking Instructions

Subject Details: Design Technology HL and SL Paper 2 Markscheme

Mark Allocation

Candidates are required to answer **ALL** questions in Section A (total **[30 marks]**) ONE question in Section B **[20 marks]**. Maximum total = **[50 marks]**.

Markscheme format example:

Question			Answers	Notes	Total
4.	b	ii	the displacement and acceleration ✓ are in opposite directions ✓	Accept <i>force</i> for <i>acceleration</i> .	2

- Each row in the “Question” column relates to the smallest subpart of the question.
- The maximum mark for each question subpart is indicated in the “Total” column.
- Each marking point in the “Answers” column is shown by means of a tick (✓) at the end of the marking point.
- A question subpart may have more marking points than the total allows. This will be indicated by “**max**” written after the mark in the “Total” column. The related rubric, if necessary, will be outlined in the “Notes” column.
- An alternative wording is indicated in the “Answers” column by a slash (/). Either wording can be accepted.
- An alternative answer is indicated in the “Answers” column by “**OR**” on the line between the alternatives. Either answer can be accepted.
- Words in angled brackets < > in the “Answers” column are not necessary to gain the mark.
- Words that are underlined are essential for the mark.
- The order of marking points does not have to be as in the “Answers” column, unless stated otherwise in the “Notes” column.
- If the candidate’s answer has the same “meaning” or can be clearly interpreted as being of equivalent significance, detail and validity as that in the “Answers” column then award the mark. Where this point is considered to be particularly relevant in a question it is emphasized by **OWTTE** (or words to that effect).
- Remember that many candidates are writing in a second language. Effective communication is more important than grammatical accuracy.
- Occasionally, a part of a question may require an answer that is required for subsequent marking points. If an error is made in the first marking point then it should be penalized. However, if the incorrect answer is used correctly in subsequent marking points then **follow through** marks should be awarded. When marking, indicate this by adding **ECF** (error carried forward) on the script. “ECF acceptable” will be displayed in the “Notes” column.
- Do **not** penalize candidates for errors in units or significant figures, **unless** it is specifically referred to in the “Notes” column.

Section A

Question			Answers	Notes	Total
1.	a	i	A prototype; A <full size> Mock-up; Aesthetic models; Instrumented models;	<i>Award [1] for stating one term that best describes a physical model which can be used to test ergonomic features.</i>	1 max
1.	a	ii	Desire to help others; Motivation to express creativity / for personal Interest; Constructive discontent; Desire to make profit / money; Technical curiosity;	<i>Award [1] for identifying each driver for invention [2 max].</i>	2 max
1.	b	i	Adaptation is when a solution to a problem in one field is used to provide a new idea for a design problem in another; The designer adapted the waste tent materials into fashion clothing and fashion accessories;	<i>Award [1] for the definition of adaptation, and [1] for a developed connection to the P+365 products [2 max].</i>	2 max
1	b	ii	Strength <tensile / compressive>; Elasticity; Waterproof / absorbance;	<i>Award [1] for identifying each property that would make synthetic fibers more suitable [2 max].</i> No mark for strong.	2 max

Question 1 continued

Question			Answers	Notes	Total
1.	c	i	Pultrusion is <a continuous manufacturing process> used to create composite materials <that have a constant cross section>; Reinforcing fibers are saturated with a liquid polymer resin and then pulled through a heated die;	Award [1] for the definition of <i>pultrusion</i>, and [1] for how it would be used in creating the straps [2 max].	2 max
1.	c	ii	Finite element analysis; Users' feedback; Virtual prototyping;	Award [1] for each point in an explanation of how CAD could be used in the design of P+365 [3 max].	3 max
1.	d	i	<u>5th – 95th</u> percentile;	Award [1] for stating the percentile range used to determine the length of the adjustable strap [1 max].	1 max

Question 1 continued

Question			Answers	Notes	Total
1	d	ii	Shows how the whole product should be assembled; Number of parts / how specific parts are fitted together/ internal details / communicate with manufacturers;	Award [1] for identifying one <i>advantage of using an assembly drawing, and one [1] for a brief explanation [2 max]</i> .	2 max
1.	e	i	Repair; The reconstruction or renewal of any part of the tent; Recondition; Rebuilding the tents so they are in “as new” condition; Recycle; Using the materials from the obsolete/discarded tents to create other products;	Award [1] for identifying one <i>mitigation strategy that could be used for the discarded festival tents, and one [1] for a brief explanation [2 max]</i> . No mark for reuse. No mark across clusters.	2 max
1.	e	ii	Life Cycle Analysis is the assessment of the effect a product has on the environment through the five stages of its life / from pre-production to disposal; By consideration of pre-production / raw materials / materials from tent fabric; By consideration of energy used / saved in manufacturing the product; By consideration of waste reduction / elimination at disposal;	Award [1] for the definition of LCA, and [1] for each consideration of how this would be used in the design of the P+365 products [3 max] .	3 max

Question			Answers	Notes	Total
2.	a		Titanium is tough / corrosion resistant <as it is a non-ferrous metal>; Therefore, less likely to crack <upon impact> / it won't rust;	Award [1] for identifying one reason for the use of titanium, and [1] for a brief explanation [2 max] .	2 max
2.	b		Compatibility is the degree to which the innovation is seen as consistent with existing values / previous experiences / needs of the user; Consumers are more likely to adopt innovations that fit with their cultures / traditions / socially acceptable;	Award [1] for the definition of compatibility, and [1] for a brief explanation of how the Heirloom flask fits with Rogers' characteristic of compatibility [2 max] .	2 max
3.			Iconic form / image; Easily recognizable <in terms of shape / function>; Widely used / timeless appeal;	Award [1] for identifying a characteristic that makes Heirloom flasks shape a classic design, and [1] for each relevant point within an explanation [3 max] .	3 Max

Question			Answers	Notes	Total
4.			Delaying decline; By updating the product's features / function / materials / safety; To adapt / react to market demand / sustainability;	<i>Award [1] for each relevant point within an explanation of how product versioning can help extend the life of the product [3 max].</i>	3 max

Section B

Question			Answers	Notes	Total
5.	a		FDM is an additive manufacturing / 3D printing / rapid prototyping technique; That builds a 3D model layer by layer / where layers are fused together as they are deposited;	<i>Award [1] for each relevant point in the description of Fused Deposition Modelling [2 max].</i>	2 max
5.	b		Market research provides valuable insights / information about competing products / market changes; To respond to changes in consumer needs / consumer preferences / legislation: In order to facilitate adoption rates;	<i>Award [1] for each relevant point in an explanation of how market research can be used to improve the predictability of a product's success and its potential lifespan in the market [3 max].</i>	3 max

Question 5 continued

Question			Answers	Notes	Total
5.	c		Psychological function Ensuring psychological comfort during running; Reassurance / leading to peace of mind / awareness of the environment; Sustainable product appealing to eco-consumers; Practical function Improving visibility; To ensure safety / to provide light for the running path; Ease of wearing / it is adjustable by each user / light weight;	<i>Award [1] for each relevant point in an explanation of the design of the Lumabelt in relation to the psychological function and the practical function [6 max].</i> <i>Mark as [3] + [3]</i>	6 max

Question 5 continued

Question			Answers	Notes	Total
5.	d		One-off production To meet an individual client's needs; To test manufacturability; To get feedback; Batch production Batch production is a set number of items to be produced; The production process can be set up / optimized for the number required; To tailor production to a particular market need; Mass customization Makes use of the benefits of mass production while enabling individual customization; Customers can upload their own graphics / logos that can be applied to their belts <in the factory>; Could be more appealing to buyers / create new market;	<i>Award [1] for each relevant point in an explanation of how Robbins may utilize one-off, batch, and mass customization strategies in the development and production of the Lumabelt [9 max].</i> <i>Mark as [3] + [3] + [3].</i>	9 max

Question			Answers	Notes	Total
6.	a		Hardness; As hardwood resists getting scratched / resists wear and tear / is durable / lasts longer;	<i>Award [1] for identifying a physical property of hard wood, and [1] for a brief explanation of how this property makes hardwood suitable for the use as the main material for the Tot-M. [2 max].</i>	2 max
6.	b		Quantitative data would be measurable / objective, while qualitative data would be subjective; Some material properties would be quantitative e.g. physical properties / mechanical properties; Some properties would be qualitative e.g. touch/ comfort / aesthetics;	<i>Award [1] for each relevant point within an explanation of how qualitative and quantitative data was used to evaluate the material choices for the Tot-M [3 max].</i>	3 max

Question 6 continued

Question			Answers	Notes	Total
6	c		Primary data Primary data is data collected for a specific purpose / that does not already exist; Collected through measurements e.g. hand size / performance testing / user trials; To optimize the size / shape / comfort of handling the textured rings; Secondary data Secondary data is collected from existing records; Based on web sources/ anthropometric tables / published literature of a range of users' sizes / percentile ranges; To ensure the design suits most users;	<i>Award [1] for each relevant point when suggesting how the designer might have collected both primary and secondary anthropometric data to inform the design and development of the Tot-M [6 max].</i> <i>Mark as [3] + [3].</i>	6 max

Question 6 continued

Question			Answers	Notes	Total
6.	d		Inventor An inventor is an individual who is committed to the invention of a <novel> product/ principle/technical advance; An inventor because it is a novel idea / based on constructive discontent; Resulting in a new product to solve the identified problem; Product Champion A product champion develops enthusiasm for a particular idea or invention / champions an idea within the organization; The designers of Tot.M developed a clear philosophy that they used to champion the product / brand; Which went viral / gained global recognition; Entrepreneur An entrepreneur is an influential individual who can take an invention to market; Tot.M designers set up a successful campaign to provide the funding / finance <for their first production run>; Has experience / knowledge of market conditions / market strategies;	<i>Award [1] for the definition of an inventor, and [1] for each relevant point in explaining why the designers of Tot-M are considered inventors [3 max].</i> <i>Award [1] for the definition of a product champion, and [1] for each relevant point in explaining why the designers of Tot-M are considered product champions [3 max].</i> <i>Award [1] for the definition of an entrepreneur, and [1] for each relevant point in explaining why the designers of Tot-M are considered entrepreneurs [3 max].</i> <i>Mark as [3] + [3] + [3].</i>	9 max

Question			Answers	Notes	Total
7.	a		Ductility is the ability of a material to be drawn or extruded into a wire; The stool is made of steel wires of The Every Stool;	Award [1] for the definition of ductility, and [1] for where it was used within The Every stool.	2 max
7.	b		Design for disassembly is designing a product so that when it becomes obsolete it can easily and economically be taken apart; The stool can be disassembled / reused / repaired / recycled; Eliminating waste / reducing energy consumption / pollution;	Award [1] for the definition of design for disassembly, and [1] for each relevant point in an explanation of why it's important to use design for disassembly for The Every Stool [3 max] .	3 max
7.	c		Perspective drawings: provide a <realistic> 3D representation of the product; Concept development; which can be used to communicate to clients / for marketing / promotional purposes; Orthographic projection: show the product from multiple 2D views <top / front / side>; and provide dimensions / scale; which are helpful to communicate between designers / manufacturers;	Award [1] for each relevant point in an explanation of why perspective drawings and orthographic drawings could be used in the design of The Every Stool [6 max] . Mark as [3] + [3] .	6 max

Question 7 continued

Question			Answers	Notes	Total
7.	d		Solid Modelling clear representations of the final part / provide a complete set of data for the product to be realized; shows joining tolerances / internal strength / material gauge; to ensure components are fit for purpose / to 3D print components for testing; Digital Humans To predict how humans will interact with the stool / for anthropometric data; To analyze safety / comfort when using the stool; Ensure that a user can easily stack the stools; FEA The calculation and simulation of unknown factors <in products using CAD systems>; To test joints / forces / stresses; To ensure each stool will bear the weight of the designed percentiles of potential customers;	Award [1] for <i>each</i> relevant point in an explanation of how solid modelling, digital humans, and finite element analysis (FEA) could help with the design and development of <i>The Every Stool</i> [3 max]. Mark as [3] + [3] + [3].	9 max