

Markscheme

May 2023

Design technology

Higher level

Paper 3

9 pages

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General Marking Instructions

Subject Details: Design Technology HL Paper 3 Markscheme

Mark Allocation

Candidates are required to answer **ALL** questions in Section A (total **[20 marks]**) ONE question in Section B **[20 marks]**. Maximum total = **[40 marks]**.

Markscheme format example:

Question			Answers	Notes	Total
4.	b	ii	the displacement and acceleration; are in opposite directions;	Accept force for acceleration .	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 semi-colon (;) 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	income; profession; age; family; values; behaviour/lifestyle;	<i>Award [1] for listing market segments used to determine the target audience for the EcoHelmet up to [2 max].</i> <i>Do not award marks for listing a target audience [for example: cyclists, people who do not own a car, etc.]</i>	2
1.	b	A price less than US \$5 attracts people to purchase the helmet; despite it being a single use/disposable product; The helmet's price would need to be low / affordable / competitive / less than \$5; because the helmet is single use / disposable / required by law / required for safety / increases sales;	<i>Award [1] for identifying how price is used to enhance market potential for the Ecohelmet and [1] for a brief explanation up to [2 max].</i>	2
1.	c	Field research is conducted in the users' natural environment / with rideshare cyclists / is based on real user experiences; which provides more authentic feedback / unlike a lab's-controlled environment;	<i>Award [1] for identifying an advantage of using field research rather than a usability lab in the development of the Ecohelmet and [1] for a brief explanation up to [2 max].</i>	2
1.	d	Quality assurance is process oriented / takes place throughout the process (covers all activities from design to documentation); ensuring the quality of raw materials / machines / staff / inspection processes / assemblies; to prevent defects / to meet specifications / to meet safety standards; and provide consumer confidence in the helmet / brand loyalty;	<i>Award [1] for why quality assurance is important in the production of the EcoHelmet and [1] for each subsequent explanation up to [4 max].</i>	4

Question		Answers	Notes	Total
2.	a	<p>Cyclic; Safe; Efficient; Social;</p> <p>Do not accept Solar;</p>	<p><i>Award [1] for listing each of two of Datschefski's five principles of sustainable design that would be relevant to the concept of the mycelium lamp up to [2 max].</i></p>	2
2.	b	<p>The mycelium lamp has minimal environmental impact / promotes ethical consumerism; as it reduces the use of resources / reduces the use of toxic materials / reduces waste / is sustainably produced / is biodegradable / compostable / has minimal carbon footprint / is renewable / safe;</p> <p>The mycelium lamp promotes social equity; as it helps meet basic human needs;</p> <p>The mycelium lamp is an economically viable product; as the material costs are low/cheap;</p>	<p><i>Award [1] for identifying a reason how the mycelium lamp promotes the idea of sustainable consumption and [1] for a brief explain up to [2 max].</i></p> <p><i>Do not award marks across clusters</i></p>	2

Question		Answers	Notes	Total
2.	c	<p>Market penetration; increasing sales of existing mycelium products to existing customers; by lowering prices / promotion / improving distribution;</p> <p>Market development; Introducing existing mycelium products to new markets; to increase sales / market share;</p> <p>Product development; introducing new/modified/updated mycelium products to existing customers; to create product families / to enhance brand loyalty / to develop products for market segments;</p> <p>Product diversification; involves introducing new mycelium products to new markets; to increase sales / market share;</p> <p>Pioneering strategy; involves being the first to market a new mycelium product (innovation); by taking advantage of strong R&D capability / to gain brand loyalty / to gain a large market share/profit;</p> <p>Imitative strategy; involves developing a product similar to an existing mycelium product; by taking advantage of R&D invested by others / to offset the risk / to lower the cost;</p> <p>Hybrid approach; using a combination of corporate strategies; to improve the chance of mycelium’s success in a competitive market;</p>	<p><i>Award [1] for identifying a corporate strategy designers could use when innovating with mycelium and [1] for each development of that strategy up to [3 max].</i></p> <p><i>Mark as [3] + [3]</i></p> <p><i>Do not award marks across clusters</i></p>	6

Section B

Question		Answers	Notes	Total
3.	a	The Swell Surf Foot is low-cost / cost-effective / is competitively priced; therefore, can gain a financial return / profit / break-even / cover cost / achieve a good return on investment / attract more customers;	<i>Award [1] for identifying why the retail price of \$65 for the Swell Surf Foot makes it economically viable for production and [1] for a brief explanation up to [2 max].</i>	2
3.	b	The Swell Surf Foot is only produced upon order / upon demand; as prosthetics need to be customized / it is for a niche market / to save storage space / to lower storage cost / to avoid unsold surplus / to implement lean production / to avoid waste;	<i>Award [1] for identifying why a just-in-time (JIT) strategy would be used for the production of the Swell Surf Foot and [1] for a brief explanation up to [2 max].</i>	2
3.	c	Pleasure that comes from the Swell Surf Foot (effectiveness) in enabling its users to surf/walk / pleasure derived from the sensory feel of the Swell Surf Foot (comfort / touching / hearing); as it is flexible / replicates the grip of a human foot / moves in ways not possible with current prosthetics / simulates the natural movement (of the ankle) / provides balance / facilitates 'pop up' (on the surfboard) / improves user engagement;	<i>Award [1] for identifying how the Swell Surf Foot affords physio-pleasure for its user and [1] for a brief explanation up to [2 max].</i>	2

Question 3 continued

Question		Answers	Notes	Total
3.	d	<p>Social: The Swell Surf Foot enables its users to surf / walk; which improves their quality of life (lead a more normal life) / well-being / enhances equity / empowerment; provides the opportunity to participate in Paralympic Games / competitions / enhances socio-pleasure;</p> <p>Economic: The Swell Surf Foot is a low-cost product / is priced competitively / affordable; which allows more people to purchase it; but still attract a profit / gain financial return;</p>	<p><i>Award [1] for each distinct point of how the inclusive nature of the Swell Surf Foot satisfies the social aspect of triple bottom line sustainability.</i></p> <p><i>Award [1] for each distinct point of how the inclusive nature of the Swell Surf Foot satisfies the economic aspect of triple bottom line sustainability.</i></p> <p><i>Mark as [2] + [3] OR [3] + [2]</i></p> <p><i>Do not award marks across clusters</i></p>	5

Question		Answers	Notes	Total
3.	e	<p>User: UCD requires an understanding of the users' wants / needs / behaviors / limitations / empathy;</p> <p>by involving users throughout the design and development process of the Swell Surf Foot;</p> <p>using personae / scenarios / use cases / field research / methods of extreme / observations / interviews / focus groups / questionnaires / affinity diagrams;</p> <p>Task: UCD requires an understanding of which functions the users expect the Swell Surf Foot to perform / of which tasks they cannot currently perform;</p> <p>through an empathy rig / a modified medical boot / testing in usability labs (usability testing sessions) / participatory design / field research / interviews / questionnaires / observations / focus groups / testing on treadmills/balance boards / iterative design;</p> <p>to test balance / ensure grip on the board/'popping up' / flexible body movement / to evaluate existing solutions / to gain feedback;</p> <p>Environment: UCD requires an understanding of where the Swell Surf Foot will be used;</p> <p>in the water / at the beach / on a surfboard / on sand / on land;</p> <p>through field research / usability labs / observations;</p>	<p><i>Award [1] how user centred design (UCD) could be used to gain an understanding of the in the development of the Swell Surf Foot up to [3 max].</i></p> <p><i>Award [1] how user centred design (UCD) could be used to gain an understanding of the task in the development of the Swell Surf Foot up to [3 max].</i></p> <p><i>Award [1] how user centred design (UCD) could be used to gain an understanding of environment in the development of the Swell Surf Foot up to [3 max].</i></p> <p><i>Mark as [3] + [3] + [3].</i></p> <p><i>Do not award marks across clusters</i></p>	9