

Markscheme

May 2022

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 <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	Soar needs to keep a stock of e-scooters / cannot afford to run out; as many scooters last for less than two months / as they are replaced frequently / to respond to sudden fluctuations in demand / to reduce the risk of increased market prices / to avoid delay from their supplier / to reduce lead time / as “Scooter sharing” has become popular in cities all over the world;	<i>Award [1] for identifying one reason why Soar use just-in-case (JIC) production for their e-scooters and [1] for a development up to [2 max].</i>	2 max
1.	b	SPC ensures e-scooters are produced within the acceptable tolerances / detects when the process mean has moved away from the target (the centre line) / identifies areas in which standards are not met; leading to the correction of the manufacturing techniques / reducing the number of defected e-scooters / reducing human error / increasing the e-scooters' product life / informing the design development of new scooters;	<i>Award [1] for identifying a way how the use of Statistical Process Control can lead to improvements in the design of the Soar Scooter and [1] for a development up to [2 max].</i>	2 max

Question		Answers	Notes	Total
1.	c	<p>integration (cooperation) between different systems (services) provided by the city authorities and e-scooter companies; to provide infrastructure/travel passes/charging points/signage/collection & drop off points/scooter lanes;</p> <p>regulation / legislation; city authorities may limit car transportation in certain areas / fine users who discard scooters;</p> <p>taxes; city authorities may provide tax incentives to e-scooter companies;</p> <p>subsidies; provide financial incentives for e-scooter companies/start-ups;</p> <p>education; city authorities may use educational programs/advertising campaigns to encourage the public to use e-scooters;</p>	<p><i>Award [1] for identifying a way how partnerships between city authorities and e-scooter companies could encourage sustainable innovation and [1] for a development up to [2 max].</i></p>	2
1.	d	<p>the e-scooters were not developed according to Datschefski's principles of design because they have a short product life / many only last for two months; therefore, Soar is not making profit / is not breaking even / not economically sustainable; they are creating waste / not an eco-design / not cyclic / not solar / not safe / not efficient / not environmentally sustainable; encouraging users to discard the e-scooters / not social / not socially sustainable;</p>	<p><i>Award [1] for identifying why the first-generation Soar e-scooters cannot be considered to be a sustainable design and [1] for a development up to [4 max].</i></p>	4

Question		Answers	Notes	Total
2.	a	Apple created a new product/modified charger; for existing customers (markets) / to match the needs of their existing customers (markets);	<i>Award [1] for identifying one way how Apple's Airpower is using the corporate strategy of product development for the AirPower and [1] for a development up to [2 max].</i>	2
2.	b	decreasing user error (effective charger); stacking and offsetting the coils; making it easier to align the coils (learnable charger); improving user experience / satisfaction; increasing product acceptance; improving productivity / charging multiple devices at once / enlarging the charging area (useful charger);	<i>Award [1] for listing each way the wireless charger was intending to achieve enhanced usability up to [2 max].</i>	2
2	c	a testing house is a company that will test the Apple Airpower on their site / under a 'real' scenario; and evaluate whether it is safe / meets its predetermined requirements / specification points / to prevent defects;	<i>Award [1] for identifying a way how a testing house might be used to provide quality assurance and [1] for a development up to [2 max].</i>	2
2.	d	a product family is a group of products with common parts and assemblies; and common manufacturing techniques; this means Apple requires less diverse materials / components / parts / machinery; leading to minimized stock holding and storage;	<i>Award [1] for identifying a reason how Apple utilizes "product families" to minimise inventory and [1] for each development of that reason up to [4 max].</i> <i>Note: Do not award marks for: minimizing inventory</i>	4

Section B

Question		Answers	Notes	Total
3.	a	<p>designers (graphic / product / packaging);</p> <p>psychologists;</p> <p>nutritionists;</p> <p>chefs;</p> <p>marketing professionals;</p> <p>lawyers;</p> <p>ergonomists;</p> <p>anthropologists / ethnographers;</p> <p>potential consumers (meat lovers / vegetarians / vegans);</p> <p>restaurant (representatives);</p> <p>scientists/chemists;</p> <p>manufacturers;</p> <p>food Standards Agencies;</p> <p>food specialist;</p>	<p><i>Award [1] for listing each member that could have been included in the multidisciplinary team up to [2 max].</i></p>	2
3.	b	<p>the taste / smell / texture / looks (cooks and bleeds) of the Impossible Burger;</p> <p>gives consumers the physical satisfaction (enjoyment) of eating real meat (beef) / means meat eaters will feel like they do not have to 'give up' their physical enjoyment of eating meat;</p>	<p><i>Award [1] for identifying a way how physio-pleasure was considered in the development of the Impossible Burger and [1] for a development up to [2 max].</i></p>	2

Question		Answers	Notes	Total
3.	c	a pioneering strategy is being first to market with a new innovation / is risky / keeps a company ahead of competitors; therefore an iterative design improves product acceptance / strengthens research and development / refines designs based on feedback / complies with UCD principles / shows empathy / responds to food trends;	<i>Award [1] for identifying why iterative design is a feature of a pioneering strategy and [1] for a development up to [2 max].</i>	2
3.	d	persona is a profile of the primary target audience for the Impossible Burger / refers to meat lovers / meat lovers who choose to eat less/cut meat / meat lovers who cannot afford real meat; secondary persona is a profile of those who are not the primary target audience , but whose needs the Impossible Burger should meet / refers to vegetarians / vegans / innovators; both aid the designers' understanding of the users' needs (wants); to create scenarios / add a layer of real-world consideration to the discussions of the design team / stimulate user experiences; and help determine the burger's ingredients / taste / price;	<i>Award [1] for identifying why designers would have used personae and secondary personae in their user research to develop the Impossible Burger and [1] for each development of up to [5 max].</i>	5

<p>3.</p>	<p>e</p>	<p>Product: the Impossible Burger is a meat substitute / imitates a real meat burger/ resembles a traditional (standard) burger; juicy / flavourful / pink middle / convincing texture and smell / cooks and “bleeds” like beef / fits in a burger bun (size); provides security / comfort / reassurance / increase sales / maintain sales / triggers consumers to purchase fries and soft drinks;</p> <p>Place: refers to how and where to distribute and sell a product; Impossible Foods partnered with well-recognized restaurants/marketed at the point of sale; so, customers may try it without changing where they would normally eat / to target the intended consumer directly / to tempt an impromptu/impulse purchase;</p> <p>Promotion: refers to the various communication/advertising methods undertaken to inform consumers about this burger / to launch this burger; Impossible Foods partnered with well-recognized restaurants; who place it on their menus / who already have customer loyalty / who market a non-meat product to meat eaters / to associate the Impossible Burger with well-known brands/products (such as Burger King / the Whooper);</p>	<p><i>Award [1] for identifying a reason how the creators of the Impossible Burger are using product to make it appeal to meat eaters and [1] for each development up to [3 max].</i></p> <p><i>Award [1] for identifying a reason how the creators of the Impossible Burger are using place to make it appeal to meat eaters and [1] for each development up to [3 max].</i></p> <p><i>Award [1] for identifying a reason how the creators of the Impossible Burger are using promotion to make it appeal to meat eaters and [1] for each development up to [3 max].</i></p> <p><i>Mark as [3] + [3] + [3].</i></p>	<p>9</p>
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