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Diploma Programme
Programme du diplôme
Programa del Diploma

Markscheme

May 2019

Design technology

Higher level

Paper 3

13 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**

1. Each row in the "Question" column relates to the smallest subpart of the question.

2. The maximum mark for each question subpart is indicated in the "Total" column.

3. Each marking point in the "Answers" column is shown by means of a tick (✓) at the end of the marking point.

4. 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.

5. An alternative wording is indicated in the "Answers" column by a slash (/). Either wording can be accepted.

6. An alternative answer is indicated in the "Answers" column by "***OR***" on the line between the alternatives. Either answer can be accepted.

7. Words in angled brackets ❮ ❯ in the "Answers" column are not necessary to gain the mark.

8. Words that are <u>underlined</u> are essential for the mark.

9. The order of marking points does not have to be as in the "Answers" column, unless stated otherwise in the "Notes" column.

10. 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).

11. Remember that many candidates are writing in a second language. Effective communication is more important than grammatical accuracy.

12. 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.

13. Do **not** penalize candidates for errors in units or significant figures, **unless** it is specifically referred to in the "Notes" column.

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Section A

Question			Answers	Notes	Total
1.	**a**		Literature search (Literary Analysis of competitors / reviews) ✓ Expert appraisal ✓ User trials ✓ User research (interviews/questionnaires/surveys) ✓ Perceptual mapping ✓ Environmental scanning ✓ Personae ✓ Use case ✓ Scenarios ✓ Field research (field trial) ✓ Methods of extreme ✓ Observation ✓ Focus groups ✓ Affinity diagramming ✓	*Award **[1]** for each type of market research listed that Nintendo may have conducted during the development of the brief for the Nintendo Switch up to **[2 max]**.*	**2 max**

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Question			Answers	Notes	Total
1.	**b**		Gain feedback ✓ by observing users testing (trialling) physical models ✓ Test how engaging / pleasurable / easy to use / easy to switch / ergonomic the Nintendo Switch is ✓ by observing users playing (independently / in a group / switching between modes) ✓ Improve (the usability) of the Nintendo Switch ✓ through participatory design / through tests in a controlled environment ✓	*Award **[1]** for identifying a way how Nintendo may have used a usability lab during the development of the Nintendo Switch and **[1]** for a brief explanation up to **[2 max]**.* *Note to examiners about cluster 2: Do not award the mark for mentioning tests without specifying an area of testing.* *Note to examiners: do not award marks across clusters*	**2 max**
1.	**c**		The "multi-player", ("three different modes" / "anytime, anywhere, with anyone") features / owning a Nintendo Switch conveys a certain status (self-image) ✓ provide socio pleasure (social interaction) / provide ideo-pleasure (satisfy gamers' values/ desires) / reflective design / behavioural design ✓ Aesthetic appeal (red and blue colours) / Novel idea (unique design stands out from other consoles) ✓ evokes ideo-pleasure (appeals to consumers' values / tastes) / visceral design ✓ The Nintendo Switch is similar to earlier gaming models (GameBoy, DS, etc.) ✓ which evokes nostalgia and encourages users to purchase it ✓	*Award **[1]** for identifying a way how designers have incorporated design for emotion to influence the success of the Nintendo Switch and **[1]** for a brief explanation up to **[2 max]**.* *Note to examiners: do not award marks across clusters*	**2 max**

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Question			Answers	Notes	Total
1.	**d**		Population stereotypes helped designers identify widespread (generalized) user expectations / needs / desires / characteristics ✓ of <u>different</u> gamers (dedicated gamers, occasional gamers, social gamers and individual gamers, families wanting to entertain their kids) ✓ **Strength:** to enhance product acceptance / user experience / likeability / decrease error / enhance learnability / increase sales / satisfy a wider target market / faster (more cost-effective) research & development / to help design teams create personae ✓ **Weakness:** ignoring new users (non-users) / ignoring extremes / making wrong assumptions / over-generalisations / discrimination / disregarding inclusive (universal design) / may not apply to all user needs ✓	*Award [1] for identifying Nintendo's use of population stereotypes and [1] for a brief explanation up to [2 max].* *Award [1] for identifying a strength of using population stereotypes.* *Award [1] for identifying a weakness of using population stereotypes.*	**4**

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Question			Answers	Notes	Total
2.	**a**		simplicity ✓ ease of use ✓ intuitive logic ✓ organization ✓ low memory burden ✓ visibility ✓ feedback ✓ mapping ✓ affordance ✓ constraints ✓	*Award **[1]** for identifying each characteristic of the PAOM online platform that will lead to an effective user-product interface up to **[2 max]**.*	**2 max**
2.	**b**		<u>CIM integrates (links) the entire production</u> (from design to distribution) of custom-printed fashion garments ✓ leading to automated manufacturing processes / creating more flexible production lines for mass customisation / reducing lead times / increasing the rate of production / reducing (eliminating) errors / reducing waste / implementing a JIT system / reducing labour / improving quality control ✓	*Award **[1]** for identifying a way how CIM creates a more efficient manufacturing system for PAOM and **[1]** for a brief explanation up to **[2 max]**.*	**2**

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Question			Answers	Notes	Total
2.	**c**		PAOM offers mass customisation / online shopping options ✓ which encourage customers to purchase more fashion items / which satisfy consumers values/needs/stylistic choice ✓ PAOM provides a wide variety of customisable garment types / PAOM Introduces new blank garment templates every 3 months ✓ encouraging consumers to purchase more often / leading consumers to purchase without considering sustainable consumption / opposing the culture of ethical consumerism ✓	*Award **[1]** for identifying a way how PAOM is an example of lifestyle consumerism and **[1]** for a brief explanation up to **[2 max]**.* *Note to examiners: do not award marks across clusters*	**2**
2.	**d**		A pioneering strategy means no/little competition in the market / provides a competitive edge in the market ✓ that has the potential to capture a large market share / that enables POAM to reach customers unsatisfied with existing designs/products ✓ and create a loyal customer base (brand loyalty) ✓ this strategy has the potential for largest profit ✓ and enhances POAM's reputation as innovators / as an innovative company / as market leader / as first to market ✓	*Award **[1]** for identifying a reason why PAOM is using a pioneering strategy and **[1]** for each subsequent development of that reason up to **[4 max]**.*	**4**

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Section B

Question			Answers	Notes	Total
3.	**a**		**Environmental:** IKEA Group initiated "People & Planet Positive" sustainability strategy; developed a scorecard ✓ aims to reduce transport-based carbon emissions by 30% by 2020 ✓ reviews sustainable manufacturing and distribution systems periodically; uses less material in products ✓ uses environmentally friendly / renewable / recycled material; uses separable / recyclable material ✓ has an efficient transportation system (maximizing the number of products per container, flat packaging) ✓ energy efficient production / renewable energy in production ✓ produces products that use less energy and water during utilisation and less waste during utilization ✓ **Economic:** IKEA is the world's largest home furnishing retailer / the company is growing (expanding) ✓ operates in over 40 countries ✓ generates profit and wealth ✓ **Social:** Employs a larger number of people / local workers / Kaizen ✓ empowers workers / highly trained workers / multi-skilled workers ✓	*Award **[1]** for listing each way in which IKEA considers corporate social responsibility up to **[2 max]**.*	**2 max**

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Question			Answers	Notes	Total
3.	**b**		Pressure groups can provide positive (or negative) publicity ✓ encouraging consumers to adopt (or boycott) IKEA's products ✓ Pressure groups use their expertise to influence policy aims and objectives of the IKEA group ✓ through campaigning and raising public awareness / campaigning and raising government awareness / attracting widespread support / educating and training IKEA about product environmental impact / gathering evidence for legal proceedings ✓	*Award **[1]** for identifying a way how pressure groups may have led to the creation of the IKEA Product sustainability score card criteria and **[1]** for a brief explanation up to **[2 max]**.* *Note to examiners: do not award marks across clusters*	**2 max**
3.	**c**		Reduce material use in products / flat packaging (efficient transport) to reduce the amount of energy required during distribution and transportation ✓ Find alternative forms of transport which require less energy / emit less carbon emissions / run on renewable energy / load more per transportation mode ✓ Open more manufacturing centres / distribution centres / manufacture closer to stores / source suppliers closer to factories ✓ Source local materials ✓	*Award **[1]** for identifying each way that IKEA has addressed the environmental impact of transportation and distribution up to **[2 max]**.*	**2 max**

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Question			Answers	Notes	Total
3.	**d**		Product families share common (standard) parts, components, aesthetics, etc. ✓ enabling IKEA to provide consumers with a wider choice (for example, range of sizes, colours, finishes, prices, etc) ✓ increasing (broadening) their target market / providing solutions for different target markets than the original product / increasing sales (profits) ✓ and developing the brand identity / brand loyalty / brand awareness ✓ because products are ubiquitous / widespread / recognizable ✓ Having products with similar parts, components, manufacturing, assemblies ✓ means similar materials and manufacturing methods (using the same machinery, staff, skills suppliers, etc.) ✓ achieving economies of scale ✓ which can reduce cost / price ✓ and entice existing and new customers to buy new and additional related products / encourage IKEA promotions on similar products within the range ✓	*Award **[1]** for identifying a reason how companies such as IKEA use product families to assist in the development of their brand and **[1]** for each subsequent development of up to **[5 max]**.* *Note to examiners: do not award marks across clusters*	**5 max**

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Question			Answers	Notes	Total
3.	e		**Maximizing flow:** by building a factory in North America / centralised location / opening retail stores in different countries ✓ IKEA can shorten transport between the factory and retail outlet / reduce lead time ✓ the use of 5S' (sorting / setting-in-order / shining / standardizing / sustaining) helps them organize the workspace / the use of value stream mapping (workflow analysis) helps the system run smoothly ✓ Highly automated (CIM) system ✓ reducing errors in manufacturing / allowing for continuous production ✓ preventing delays in the process / allowing for rapid change over ✓ Offering a variety of product families ✓ based on modular furniture ✓ reduces supplier lead-time / reduces down-time ✓	*Award **[1]** for identifying a reason how IKEA practices the principles of lean production by maximising flow and **[1]** for each subsequent development of up to **[3 max]**.*	9
			Minimising inventory: Lean production implies the use of a JIT approach ✓ and the "more from less" (less material needed on site) criteria implemented by IKEA ✓ leading to the purchase/storage of less inventory ✓ Higher quality management ✓ lowers errors in the manufacturing ✓ reducing the need for reworking defected products (replacement parts) ✓ Integrated IT systems ✓ allow for real time stock control checks ✓ to order in exactly what is needed / when it is needed ✓ IKEA has a culture that implements the 5Ss ✓ this helps sort out unnecessary items (equipment / materials / components) ✓ maintaining only what is relevant to the production ✓	*Award **[1]** for identifying a reason how IKEA practices the principles of lean production by minimising inventory and **[1]** for each subsequent development of up to **[3 max]**.*	

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3.	**e**		**Creating a culture of continuous improvement:** IKEA constantly reviews (improves) its manufacturing and distribution systems to ensure they are sustainable ✓ it bases its lean production system on Kaizen ✓ empowering its workforce / encouraging all to identify problems/faults ✓ IKEA developed a "Sustainability Scorecard" ✓ to measure how sustainable their products are at each stage of their life cycle ✓ and suggest ways to better meet their vision for a more sustainable future ✓ IKEA constantly reviews (improves) its manufacturing and distribution systems; this may be achieved by using value stream mapping / workflow analysis / eliminating the 7 wastes / Kaizen ✓ to spot and reduce problematic areas (bottlenecks) ✓	*Award **[1]** for identifying a reason how IKEA practices the principles of lean production by creating a culture of continuous improvement and **[1]** for each subsequent development of up to **[3 max]**.* *Note to examiners: do not award marks across clusters* *Note to examiners: do not award marks unless it is clear that candidate has linked the points to their correct principle.*	**9**

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