N18/4/DESTE/HP3/ENG/TZ0/XX/M

Diploma Programme
Programme du diplôme
Programa del Diploma

Markscheme

November 2018

Design technology

Higher level

Paper 3

8 pages

Section A

Question			Answers	Notes	Total
1.	a		Tesla's Powerwall 2 system involves small-scale energy production / is designed for individual, household or small community use ✓ it stores energy from renewable (sustainable, solar resources) / provides opportunities for individuals to go off grid and secure their energy needs from sustainable resources ✓	*Award [1] for identifying how the Powerwall 2 system is an example of micro-energy sustainability and [1] for a brief explanation*	**2**
1.	b		regulation/legislation ✓ education ✓ subsidies ✓ taxes/fines ✓	*Award [1] for listing each method of government intervention.* *[2 max]*	**[2 max]**
1.	c		Powerwall 2 system provides an opportunity for consumers to consciously purchase a product that minimises environmental damage (for example: global warming, climate change, pollutants, etc.) ✓ by promoting the use of renewable energy / by reducing reliance on fossil fuels / by storing energy from solar panels / sustainable energy consumption ✓	*Award [1] for identifying how the Powerwall 2 system can support the concept of ethical consumerism and [1] for a brief explanation*	**[2 max]**
1.	d		**Eco-champion:** Attitude: adopt/support environmental issues ✓ Behaviour: will promote the Powerwall 2 system within an organization ✓ **Eco-phobes:** Attitude: resent talk and discussion of environmental issues / doubt claims relating to the sustainable performance of Tesla Powerwall 2 ✓ Behaviour: will not adopt this system / may fight against it ✓	*Award [1] for each of two distinct points in that compare the consumer attitudes of an eco-champion and an eco-phobe* ***[2 max]*** *Award [1] for each of two distinct points that compare the consumer behaviours of an eco-champion and an eco-phobe* ***[2 max]***	**4**

Question			Answers	Notes	Total
2.	a		a product family is a group of products that have common processing / manufacturing techniques / parts / assemblies ✓ reducing training / reducing down time / reducing dealing with various suppliers / reducing lead time /reducing space requirements / reducing waste / reducing manufacturing cost / improving efficiency ✓	*Award [1] for identifying one benefit of Garmin developing a product family as a feature of lean production and [1] for a brief explanation*	**2**
2.	b		automated systems / reduction in errors / higher production rate / higher quality management / global workflow / global distribution / reduction in costs ✓ through computer monitoring and controlling of the entire process / production ✓ reduction in the size of workforce ✓ because of automated manufacturing processes ✓ real-time data exchange ✓ between all the elements of CIM (design, planning, purchasing, cost accounting, distribution) ✓	*Award [1] for identifying one advantage of Garmin using computer aided manufacturing (CIM) and [1] for a brief explanation*	**[2 max]**
2.	c		higher sales / stand out in a competitive market ✓ as consumers are committed to purchasing Garmin products / regardless of their price ✓ less risk for Garmin ✓ when adopting product development / diversification / pioneering strategies ✓	*Award [1] for identifying the importance of consumer brand loyalty <u>to Garmin</u> and [1] for a brief explanation*	**[2 max]**

Question			Answers	Notes	Total
2.	d		**Advantages of adopting a pioneering corporate strategy:** pioneering strategies normally lead to a first-to-market / no or less competition ✓ which may lead to significant financial rewards ✓ may lead to brand loyalty ✓ consumers perceive Garmin as an innovative company ✓ **[2 max]** **Disadvantages of adopting a pioneering corporate strategy:** requires a large amount of funding for research and development / innovative technologies and manufacturing techniques may be required, that require large capital investment ✓ product champions are required to support and invest in new ideas ✓ pioneering techniques are full of risk / no guarantee that product will be successful; others can imitate their innovative products and surpass them ✓ **[2 max]**	*Award [1] for each of two distinct points that explain the advantages of companies such as Garmin adopting a pioneering corporate strategy* ***[2 max]*** *Award [1] for each of two distinct points that explain the disadvantages of companies such as Garmin adopting a pioneering corporate strategy* ***[2 max]***	**[4 max]**

Section B

Question			Answers	Notes	Total
3.	a		literature search ✓ expert appraisal ✓ user trial ✓ user research/questionnaires ✓ perceptual mapping ✓ environmental scanning ✓	*Award [1] for listing each market research strategy that could have been used in the development of the IKO prosthetic arm.* *[2 max]*	**[2 max]**
3.	b		involve users throughout design / throughout development ✓ include users in testing designs / in prototype testing sessions / in usability testing sessions ✓ modifications are based on users' feedback (iterative) ✓	*Award [1] for identifying each characteristic of participatory design.* *[2 max]*	**[2 max]**
3.	c		**Good understanding of <u>User</u>:** empathize / understand users' needs, wants and limitations ✓ by involving users throughout the design and development of the IKO prosthetic arm / through participatory design ✓ **Good understanding of <u>Task</u>:** understand which functions users require the IKO prosthetic arm to perform / which tasks users cannot currently perform ✓ through prototype testing ✓ **Good understanding of <u>Environment</u>:** understand where users will use the IKO prosthetic arm ✓ through performance testing / field research / testing it in all appropriate environments (swimming, playing, etc.) ✓	*Award [1] for identifying how UCD applies to the design and development of the IKO prosthetic arm and [1] for a brief explanation*	**[2 max]**

Question			Answers	Notes	Total
3.	d		**Learnability:** how easy (intuitive) it is for a child to learn how to use the IKO prosthetic arm; affects how much help (training / support / instructions) a child needs / how willing a child is to use it ✓ lowers memory burden ✓ **Attitude:** positive users' perceptions, feelings and opinions (likeability) of the prosthetic arm ✓ make it more interesting (fun) for a child to use / increase product acceptance ✓ **Overall** learnability and attitude are important to the success of the IKO prosthetic arm / they allow for a good user experience / encourage user to buy it / encourage users to recommend it to others ✓	*Award [1] for each of two distinct points that explain why attitude is important usability objectives for the IKO prosthetic arm* *Award [1] for each of two distinct points that explain why learnability is important usability objectives for the IKO prosthetic arm* *Award [1] for an appropriate conclusion.*	**5**

Question			Answers	Notes	Total
3.	e		**Socio-pleasure** ✓ users feel more abled / more peer accepted ✓ belong to group of people who use prosthetic arms ✓ not excluded from activities ✓ status conveyed to others from owning a (fun) prosthetic arm ✓ initiates social conversation ✓ **[3 max]** **Physio-pleasure** ✓ wearing / controlling / operating / touching the arm ✓ pleasure from enabling hand dexterity and direct manipulation of artefacts ✓ pleasure from comfortably using the arm ✓ **Ideo-pleasure** ✓ arm is made using Lego parts / funded by Lego future lab ✓ customizable/ can be given different attachments that relate to superheroes ✓ aesthetic / technological value ✓ Lego brand loyalty ✓ pleasure from feeling normal / less restricted / freedom ✓	*Award [1] for each of three distinct points in an explanation how the IKO prosthetic arm uses socio-please, physio-pleasure **and** ideo-pleasure to satisfy the user.* ***[3 max]** for each.* *Note to markers: do not award marks across different clusters.*	**[9 max]**