Markscheme

November 2017

Design technology

Higher level

Paper 3

11 pages

Section A

Question			Answers	Notes	Total
1.	**a**		*Answers may include:* literature search ✓ expert appraisal ✓ user trial ✓ user research /questionnaires / interviews / surveys ✓ perceptual mapping ✓ environmental scanning ✓	*Award [1] for identifying each market research strategy that could be used in the development of the Dualit toaster.*	**2 Max**
	b		product development (strategy) ✓ modified design targeting an existing market / leading to the development of a product family✓	*Award [1] for identifying a strategy used by Dualit by introducing the Dualit toaster in a range of different sizes and colours and [1] for a brief explanation*	**2**

	c		***Just in case (JIC) production strategy:*** Dualit keeps a stock of components / parts / finished toasters ✓ Toasters are created in advance and in excess of demand ✓ Storage space is needed ✓ Higher capital investment ✓ **[2 max]** ***Just in time (JIT) production strategy:*** Dualit will not keep a stock of components / will have very small stocks / will have a limited buffer / will not need storage ✓ components will be ordered from suppliers when required ✓ Toasters that are not ordered are not made ✓ **[2 max]** Dualit may see the additional cost of maintaining stock in a JIC strategy to be preferable to the risk of being unable to respond rapidly to sudden fluctuations in demand ✓ however, they may be left with unsold stock if there is a downturn in the market; A JIT strategy allows Dualit to implement lean production ✓ but they may risk manufacturing delay / delay from suppliers ✓ ***[2 max]***	*Award [1] for each of two distinct points of a JIT production strategy for Dualit up to [2max].* *Award [1] for each of two distinct points of a JIC production strategy for Dualit up to [2max].* *And award [1] for each of two distinct points comparing the two production strategies for the Dualit toaster up to [2max].* *[Max 4] for a generic response that does not refer to the Dualit Toaster.* ***Note to examiners:*** *Candidates may use points in reverse.*	**6 max**

Question			Answers	Notes	Total
2.	**a**		energy labels allow consumers to compare the energy consumption of products during utilization ✓ to make environmentally friendly/sustainable choices / more cost-effective choices / determine lowest running costs ✓	*Award [1] for identifying identifying a benefit to the consumer of providing energy labelling on products such as the Fisher & Paykel Appliances DishDrawer™ and [1] for a brief explanation*	**2**
	b		ecophobe ✓ actively resent the talk of environmental protection / see the environment for use and control of humans / see environmentalists having a negative view of technological progress ✓	*Award [1] for identifying the type of customer who doubts claims related to the sustainable performance of products such as a Fisher & Paykel Appliances DishDrawer™ and [1] for a brief explanation*	**2**
	c		the report allows manufacturers to measure the impacts they cause or experience ✓ this allows them to set goals / set sustainable strategies / manage change / build trust with consumers / encourage "green fans" to buy their products / reduce reputational risk / drive innovation / increase efficiency / improve brand loyalty / improve morale / increase transparency / create a competitive advantage in the market / attract capital from green investors ✓	*Award [1] for identifying the benefits for Fisher & Paykel Appliances of using sustainability reporting and [1] for a brief explanation*	**2**

	d		take back legislation has implications for designers and manufacturers in terms of material and manufacturing choices ✓ for example, this may mean that products have to be designed for ease of disassembly / temporary joining techniques / reduction in the number of parts to be separated ✓ or materials have to be chosen according to their ease of recyclability / reuse / reduction in the variety of materials used / dematerialization / reduction in waste ✓ or design products to have an extended product life / to overcome functional obsolescence ✓ this may require the use of standard (modular) parts to maximise the ability to be maintained, repaired and reconditioned; companies may also need to develop logistical ways to collect their products once obsolete, such as incentivising users to return them ✓	*Award [1] for each of four distinct points in an explanation of how take back legislation might influence the design and development of products such as the Fisher & Paykel Appliances DishDrawer™.*	**4 max**

Section B

Question			Answers	Notes	Total
3.	**a**		*Answers may include:* usefulness ✓ effectiveness ✓ learnability ✓ attitude/likeability ✓ efficiency ✓	*Award [1] for identifying each usability objective that may have been used in the design of the NeoNurture.*	**2 max**
	b		*Answers may include:* ergonomists ✓ medical professionals / doctors / nurses ✓ designers ✓ local mechanics ✓ car part suppliers ✓ ethnographers ✓ anthropologists ✓ psychologists ✓ local governments / non-profit organisations ✓ manufacturers / engineers ✓	*Award [1] for identifying each member of a multi-disciplinary user-centred design team that would be involved in the development of the NeoNurture.*	**2 max**

	c		personae are fictional characters that represent the primary target audience of the NeoNurture ✓ they aid the understanding of users / tasks / needs / environments ✓ personae are used to build a range of possible real-life scenarios ✓ to explore the design situation in more detail / offer alternative insights / stimulate user experiences / to show empathy ✓ personae focus the design development ✓ by adding a layer of real-world consideration to the discussions of the design team ✓	*Award [1] for identifying one advantage of using personae in the development of the NeoNurture and [1] for a brief explanation*	**2 max**
	d		the intuitive logic (simplicity) of setting and adjusting the temperature / time of the NeoNurture allows the product to be used with little instruction ✓ the use of symbols / icons in the interface contributes to its ease of use by overcoming language barriers ✓ the appropriate use of mapping allows the user of the NeoNurture to recognise that the dial (control) adjusts the temperature (function) ✓ the dial on the screen affords turning to adjust the temperature ✓ the bar to the right of the dial provides visual feedback when the user adjusts the temperature /time ✓ the user interface of the NeoNurture is well organized which reduces the memory burden for users ✓ the user interface of the NeoNurture has been designed so that it limits/constrains user actions that may lead to errors / undesired outcomes (dangerous temperatures) ✓	*Award [1] for each of five distinct points in an explanation of how the design of the interface of the NeoNurture has contributed to the success of the product*	**5 max**

			all controls of the NeoNurture are visible to users / visible in the dark ✓ the large sized numbers used to display temperature /time enhance visibility / minimize errors ✓		
	e		***Research / Research Learning:*** research into the premature babies that are going to use this product ✓ so gathering anthropometric data such as their length, reach, weight, *etc* / gathering information about the levels of oxygen / temperature / airflow required by premature babies ✓ to ensure the environment is optimised for their development ✓ research into local resources in developing countries, such as used spare car parts / which car parts can be used ✓ and local skills, such as the expertise of local car mechanics / medical professionals ✓ to enable the manufacturing of a functional / reliable / safe incubator ✓ identify users' needs / user experience / personae / scenarios ✓ by directly contacting / involving potential users / empathizing ✓ using a variety of UCD techniques such as focus groups, interviews, questionnaires, analysis of competing products, *etc*. ✓ ***[3max]*** ***Concept / Concept Examining:*** a UCD team comes up with preliminary solutions to address users' needs ✓ then involves potential end users / experts in the evaluation of concepts using concept models / paper prototypes ✓ to gather in-depth insight of users' perspective / requirements early in the process ✓	*Award [1] for each of three distinct points in how three of the stages of user-centred design have been considered in the development of the NeoNurture.*	**9 max**

			a UCD team develops usage scenarios / use cases ✓ to deepen their understanding of users' behaviours / requirements ✓ and reflect real user experiences in the design ✓ ***[3max]*** ***Design:*** a UCD team develops the design based on continuous user evaluation/ involvement / feedback ✓ using an iterative process ✓ until the NeoNurture is optimised for its end-users ✓ a UCD team carries extensive usability testing of mock-ups/ prototypes of the NeoNurture ✓ the result of each test feeds into and refines the next ✓ which means that every aspect of the NeoNurture is examined / revised in detail from its users' point of view ✓ ***[3max]*** ***Implementation:*** prior to its launch, end-users / experts need to be involved in the testing of a (high fidelity /final) prototype of the NeoNurture ✓ this will enable the NeoNurture to be as "bug-free" as possible ✓ and ensures it provides the best possible end-user experience/ meets all identified requirements / is accessible ✓ end users / local mechanics need to assess a (high fidelity /final) prototype of the NeoNurture in terms of maintenance repair ✓ and the availability of replacement parts ✓ to make sure it has a long product life ✓ ***[3max]***		

			Launch: the launch of the NeoNurture needs to be managed so end-users are able to make a smooth transition from existing products (if necessary) ✓ however, the launch does not mean the end of the UCD process ✓ as gathering additional feedback from a range of sources (usability testing, focus groups, competitor comparisons, expert appraisals, *etc*) is necessary to inform any future development of the product ✓		