Markscheme

November 2020

Design technology

Higher level

Paper 3

11 pages

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 the means of a semi colon (;) 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.

Section A

	Question		Answers	Notes	Total
1.	**a**		Understanding of users, tasks and the environment / empathy; involving users design and development / user-centred evaluation; iterative; addressing the whole user experience; multi-disciplinary teams; inclusive;	*Award [1] for listing each UCD principle the thermostat's design team may have followed up to [2 max].*	**2 max**
1.	**b**		designed the dial to rotate clockwise for "turning the heat up" / anticlockwise for "turning the heat down"; which is the convention for increasing or decreasing (values) for other products; red indicates an increase in temperature; blue indicates a decrease in temperature; the thermostat indicates it is saving energy with a green globe (HeatSmart globe icon); the colour green is associated with environmentally friendly products (green products); population stereotypes are responses that are (found to be) widespread in a user population; adjusting the temperature on other products is also done by turning a dial/knob;	*Award [1] for identifying a way that the thermostat's design team might have considered population stereotypes and [1] for a development that way up to [2 max].*	**2 max**

Question			Answers	Notes	Total
1.	c		**Feedback:** the thermostat/interface displays the current and target temperatures; the screen colour indicates whether the temperature is increased (red) or decreased (blue); indicating an estimated time to reach target temperature / leaf appears when saving energy; there is haptic / audible feedback when the dial is turned; **Low memory burden:** no complicated instructions /display is well organized; self-learning / creates personalized schedule for its users /a simple dial that affords turning; intuitive, the user does not need to remember how to set the thermostat;	*Award **[1]** for identifying a way how the design of the thermostat's user interface provides clear feedback for its users and **[1]** for each subsequent development of up to **[3 max]**.* *Award **[1]** for identifying a way how the design of the thermostat's user interface provides low memory burden for its users and **[1]** for each subsequent development of up to **[3 max]**.* *Mark as **[3]** + **[3]**.*	**6**

	Question		Answers	Notes	Total
2.	**a**		CIM monitors/controls automated manufacturing processes; resulting in a more consistency/accuracy/less defects; CIM can lead to reduction in the size of the workforce; which minimizes human error; CIM automatically reports all functions on factory floor/CIM integrates (links) the entire production system; which increases efficiency / helps detect defects on the spot (in real time);	*Award [1] for identifying a way computer integrated manufacturing (CIM) enhances quality control and [1] for a development of that way up to [2 max].*	**2 max**
2.	**b**		VSM allows for an overview of all current processes / VSM includes information flow, material flow and time line; to identify (visually spot) where the delay (problematic area / bottleneck / 7 wastes) is taking place / to maximize flow / reduce time between initiation and execution of a process;	*Award [1] for identifying a way how value stream mapping (VSM) would help Mouna & Partners reduce lead time and [1] for a development up to [2 max].*	**2**

	Question		Answers	Notes	Total
2.	**c**		**Advantage:** no need for large storage space; as the business partners with suppliers; and orders parts or components when required; fewer unsold items; as production levels are based on customer demand; items not ordered are not made; less storage cost; as Mouna & Partners only manufacture what is ordered; reducing inventory; **Disadvantage:** unable to meet rapid changes in demand; as there is no buffer of goods in stock; so Mouna & Partners may miss potential business opportunities; risk of manufacturing delay; if suppliers do not deliver on time; the business cannot meet its deadlines; no economies of scale; as the business does not buy in bulk; which may drive cost and price up;	*Award **[1]** for identifying an advantage of Mouna & Partners moving towards a just-in-time strategy and **[1]** for each subsequent development of that advantage up to **[3 max]**.* *Award **[1]** for identifying a disadvantage of Mouna & Partners moving towards a just-in-time strategy and **[1]** for each subsequent development of that disadvantage up to **[3 max]**.* *Mark as **[3]** + **[3]**.*	**6**

Section B

	Question		Answers	Notes	Total
3.	**a**		product development; new products (new flavours) are introduced into an existing market;	*Award **[1]** for identifying the corporate strategy that applies to the production of Tony's Chocolonely chocolate bars between the months of October and December and **[1]** for a brief description of up to **[2 max]**.*	**2**
3.	**b**		increasing sales / profits / satisfied customers / brand loyalty; by offering a wide range of choice/tastes; cost effectiveness; able to use the same/existing manufacturing capabilities (same machinery, staff, skills, suppliers); achieves economies of scale; by buying (similar ingredients) in bulk;	*Award **[1]** for identifying a benefit to the company of creating a product family for the chocolate bars and **[1]** for a development of up to **[2 max]**.*	**2 max**

Question			Answers	Notes	Total
3.	**c**		utilizing media to draw attention (raise awareness); to the issues of farmers (workers / inappropriate labour conditions / destruction of rain forests) in the cocoa industry; exert influence on major chocolate producers; to change (verify) their cocoa sources / to pay cocoa farmers a higher price / to buy cocoa from farmers paying their workers fair wages; encourage ethical consumerism of chocolate / provide negative publicity; to boycott chocolates from untraceable sources / to boycott chocolates that destroy rain forests / to boycott chocolates that exploit farmers (workers); provide positive publicity; encouraging consumers to purchase Tony's Chocolonely chocolates;	*Award **[1]** for identifying one way how pressure groups may have influenced the development of the Tony's Chocolonely brand and **[1]** for a development of that way up to **[2 max]**.*	**2 max**

	Question		Answers	Notes	Total
3.	**d**		brand identity is used to differentiate Tony's Chocolonely products from its competitors (in the market) / make a strong connection to the consumer / develop loyalty to the product; the logo with the broken chains; reflects the removal of inappropriate labour conditions; appeals to the consumers ethical viewpoint / promotes fair trade; unequally divided chocolate pieces; reflect the inequalities in profits in the chocolate industry / reflect the inequalities in the distribution of income from the chocolate bar / reflect the desire to pay the chocolate farmers a fair (or living) wage; colourful packaging; reflect optimism in achieving Tony's Chocolonely mission;	*Award **[1]** for identifying a reason how Tony's has developed a brand identity for the choco bar to support their mission and **[1]** for each subsequent development of that reason up to **[5 max]**.*	**5 max**

Question			Answers	Notes	Total
3.	**e**		Social; putting profits back into the community by building schools, hospitals, supporting charities, *etc.;* investing in agricultural (cocoa farming) training; fighting against cocoa slavery (child labour / buying traceable cocoa beans; empowering farmers; improving workers' living conditions (providing loans); Environmental; cleaning water sources / providing clean drinking water; training farmers to minimize the use of pesticides (chemicals)/utilise organic farming methods; manufacturing wrapping paper from recycled paper / from sustainably managed forests (Forest Stewardship Council approved) / from local materials; implementing clean technologies; eco-labelling their products; Economic; expanding the business (into different parts of the world); introducing more chocolate bar sizes; applying product development /diversification strategies; Increasing the circle of farmers receiving fair prices (making a decent living); establishing a long-term relationship with cocoa farmers; Earning fair trade certification;	*Award [1] for identifying an additional strategy Tony's Chocolonely could use to promote social sustainability and [1] for each subsequent development of up to [3 max].* *Award [1] for identifying an additional strategy Tony's Chocolonely could use to promote environmental sustainability and [1] for each subsequent development of up to [3 max].* *Award [1] for identifying an additional strategy Tony's Chocolonely could use to promote economic sustainability and [1] for each subsequent development of up to [3 max].* *Mark as [3] + [3] + [3].* *Do not accept any of the existing strategies contained in the stimulus material as follows:* *Social - awareness of exploitation of workers* *Environmental - preserving rainforests* *Economic - fair wages*	**9**