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**Design technology**  
**Higher level**  
**Paper 3**

3 November 2023

**Zone A** morning | **Zone B** morning | **Zone C** morning

Candidate session number

1 hour 30 minutes

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**Instructions to candidates**

- Write your session number in the boxes above.
- Do not open this examination paper until instructed to do so.
- Answer all of the questions.
- Answers must be written within the answer boxes provided.
- A calculator is required for this paper.
- The maximum mark for this examination paper is **[40 marks]**.



## Section A

Answer **all** questions. Answers must be written within the answer boxes provided.

- Figures 1 and 2** show the Ripple washing machine. It was developed by a multidisciplinary team to be very efficient in its water usage. It also has a distinctive and unique form.

The digital interface has been designed to reduce the memory burden of its users. Users can control four variables: water temperature, washing mode, speed and time. **Figure 3** shows a user adjusting the speed.

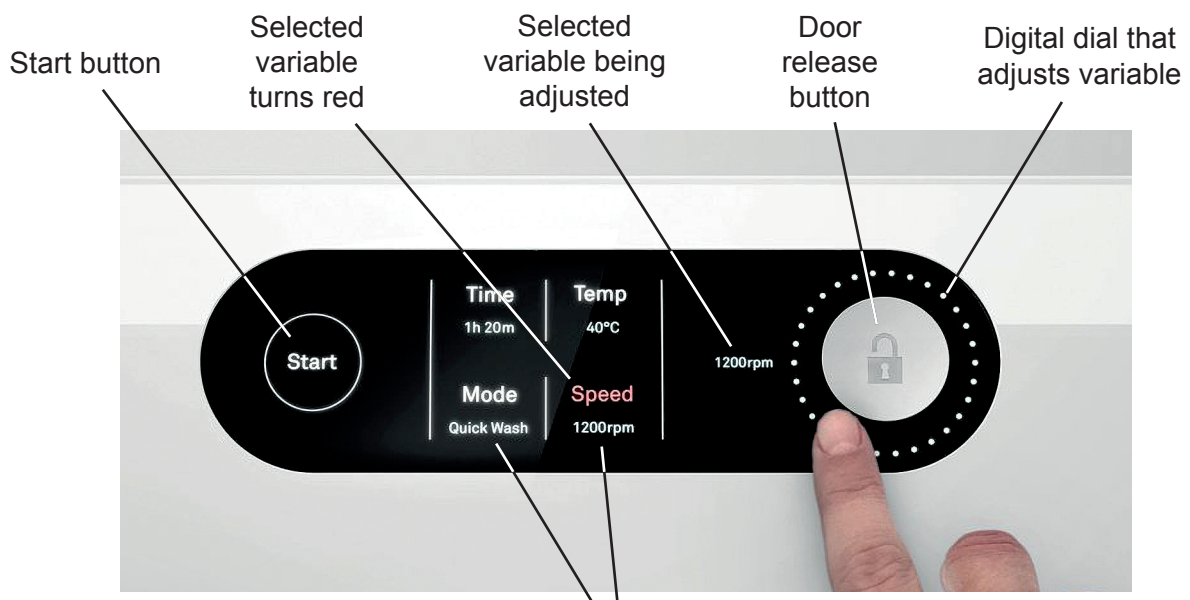
**Figure 1: The Ripple washing machine**



**Figure 2: The distinctive design of the Ripple washing machine**



**Figure 3: The digital user interface of the Ripple washing machine**



The selected option is displayed under each variable

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(Question 1 continued)

- (a) List **two** members of a multidisciplinary user-centred design (UCD) team that would be involved in the development of the Ripple washing machine. [2]

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- (b) Outline how the Ripple washing machine produces ideo-pleasure for its users. [2]

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- (c) Outline **one** advantage of creating personae in the design and development of the Ripple washing machine. [2]

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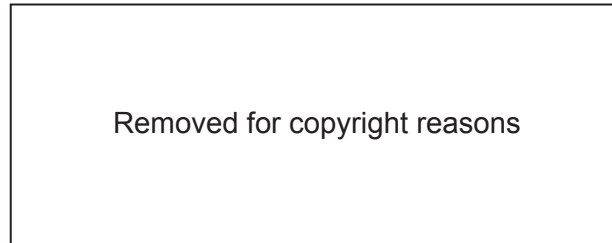
- (d) Explain how the user interface of the Ripple washing machine reduces memory burden. [4]

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2. Jordanian architect Abeer Seikaly has designed a sustainable tent for refugees\* woven from natural materials, see **Figure 4**. The tent is easy to set up and fold away, is well ventilated, collects rainwater and generates electricity from solar power, see **Figure 5**.

**Figure 4: Dome shaped tent provided for refugees**



**Figure 5: Water storage tank for collecting rainwater and battery for storing solar energy**



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\* refugees: people who have been forced to leave their country to escape war, violence, conflict or persecution

**(This question continues on the following page)**



(Question 2 continued)

- (a) List **two** ways pressure groups can help in promoting the adoption of tents, such as the one shown in **Figure 4**, for refugees. [2]

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- (b) Outline why the tent in **Figure 4** is an example of sustainable development. [2]

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- (c) Outline **one** of Datschefski's five principles of sustainable design that apply to the tent in **Figure 4**. [2]

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- (d) Explain how government intervention can enable sustainable products, such as the tent in **Figure 4**, to become sustainable innovations. [4]

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## Section B

Read the case study. Answer the following question. Answers must be written within the answer boxes provided.

3. Caliso is an online company that sells and delivers made-to-order Bed-in-a-Box mattresses, see **Figure 6**. Since its launch in 2015, its collection of mattresses has grown to include four different types: Original, Hybrid, Ultra and Studio, see **Figure 7** and **Figure 8**. All the mattresses are made from recycled and natural materials.

Each mattress type is priced differently and is available in six different sizes (Twin, Twin XL, Full, Queen, King and King XL). Caliso has recently offered free delivery. Customers can also return the mattress if they are not satisfied with it within 100 days of the purchase date.

The Caliso headquarters runs on renewable energy, and workers enjoy an on-site gym. For every 10 mattresses purchased, Caliso donates one mattress to a child in need.

**Figure 6: Caliso  
Bed-in-a-Box package**



[Source: iStock.com / Veronika Zimina]

**Figure 7: The Original Caliso mattress**



**Figure 8: The Caliso Mattress collection and price range**



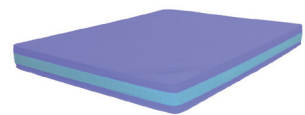
**Original Mattress**  
From: **US\$999**



**Hybrid Mattress**  
From: **US\$1699**



**Ultra Mattress**  
From: **US\$2049**



**Studio Mattress**  
From: **US\$699**

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**(Question 3 continued)**

- (a) List **two** possible price setting strategies that could have been used by Caliso. [2]

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- (b) Outline how empowering workers would help Caliso enhance its quality control. [2]

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- (c) Outline how the Bed-in-a-Box packaging contributes to Caliso brand identity. [2]

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**(Question 3 continued)**

- (d) Explain the advantages of using computer integrated manufacturing (CIM) in implementing a just in time (JIT) approach for Caliso.

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(e) Explain why Caliso has utilized market penetration, a product family **and** corporate social responsibility (CSR) to achieve its market growth.



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- Figure 7** luigicora / Pixabay.
- Figure 8** sensopur / Pixabay.

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12EP10

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