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Design technology
Higher level and standard level
Paper 2

15 May 2026

Zone A afternoon | **Zone B** afternoon | **Zone C** afternoon

Session number

1 hour 30 minutes

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Instructions to students

- Write your session number in the boxes above.
- Do not open this examination paper until instructed to do so.
- Section A: answer all questions.
- Section B: answer one question.
- Answers must be written within the answer boxes provided.
- A calculator is required for this paper.
- The maximum mark for this examination paper is **[50 marks]**.



Section A

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

1. Fernando Ramirez and Justin Beitzel are designers for the Design Studio brand Common Object. They were dissatisfied with some furniture that stated it was designed using circular economy principles, as they did not feel it was authentic.

The designers are passionate about retaining minimal form with simple clean lines that function more intuitively. In response, the two designers created furniture products directly from waste wood, see **Figure 1**.

Figure 1: Foot stools by the Design Studio brand Common Object



- (a) (i) State **one** negative environmental impact of using timber to create a product.

[1]

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(This question continues on the following page)



(Question 1 continued)

- (ii) Outline how the re-use waste mitigation strategy applies to the Common Object Furniture.

[2]

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- (b) (i) The sustainability of the stool is important to some consumers.

Outline **one** category of consumer that stools would appeal to.

[2]

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- (ii) Describe how the designer of the Common Object furniture has achieved a balance between form and function.

[2]

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(Question 1 continued)

- (c) (i) Identify **one** positive impact of dematerialization for two chosen stages of the product life cycle of the stool.

[2]

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- (ii) Explain **one** reason why few inventions become innovations.

[3]

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- (d) (i) For the designers it was important that customers appreciate that furniture can be attractive, even if it is made from waste products. Their aim was to promote the idea that using large quantities of raw materials should be controlled and using all the raw material is important.

State which modelling principle would be used to specifically show the texture of the stool.

[1]

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(This question continues on the following page)



(Question 1 continued)

- (ii) List **two** environmental impacts of a manufacturing process that uses large quantities of raw materials.

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- (e) (i) List **two** characteristics of natural timber.

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- (ii) Compare the roles of the product champion and entrepreneur.

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2. The Anglepoise lamp is a classic design product (**Figure 2**). Anglepoise lamps have been made from a variety of materials over the years, evolving from the early full steel prototypes into later models made from brass and aluminum.

Figure 2: Anglepoise lamp designed by George Carwardine in 1932



- (a) Outline **one** characteristic that makes the Anglepoise lamp a classic design.

[2]

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(This question continues on the following page)



(Question 2 continued)

- (b) Outline why it is more practical to use a metal alloy (steel) rather than a pure metal (iron) for the Anglepoise lamp.

[2]

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3. Explain how copyright can be used as a strategy for the protection of intellectual property (IP). [3]

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4. Identify a material with a high Young's modulus and outline its application. [3]

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Section B

Answer **one** question. Answers must be written within the answer boxes provided.

5. The Smart Cane is a high-tech assistive device that has been designed specifically for people with sight (visual) impairment, see **Figure 4**.

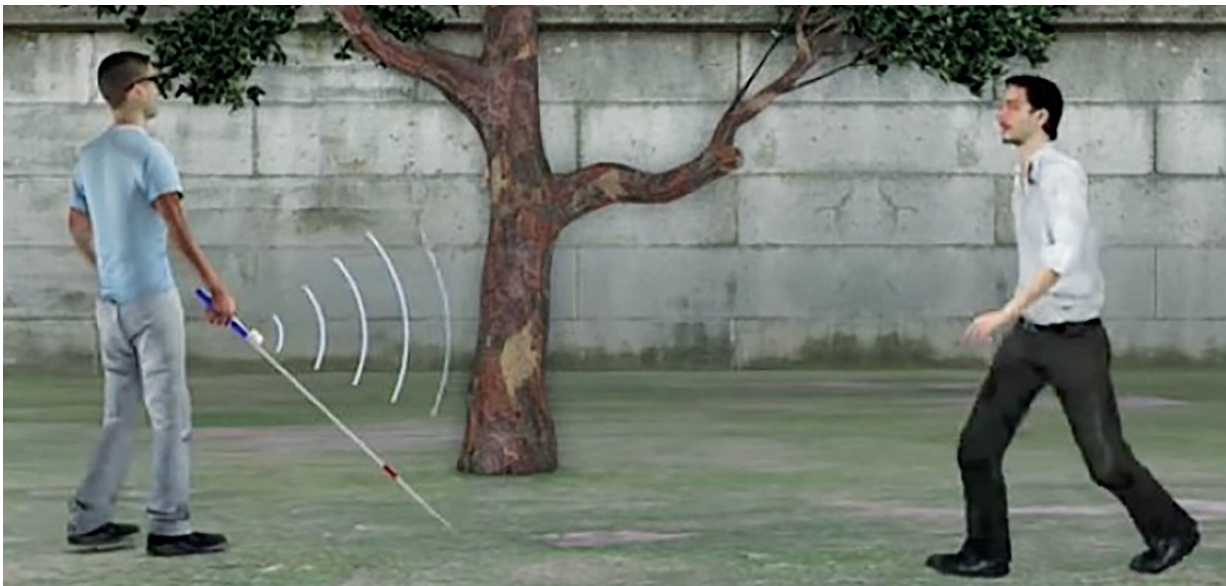
Smart Cane technology allows people with sight (visual) impairments to walk safely unaided, see **Figure 4**. The cane offers users the chance to keep their own traditional walking cane and adapt it by using an add-on Smart Cane unit (**Figure 3**) that clicks on to the user's walking cane.

To support a positive life cycle and limit the ecological impact, the Smart Cane technology inside of the device handle is recycled from other devices.

Figure 3: Smart Cane control device and handle, pictured close up



Figure 4: Smart Cane detecting objects for a user walking in the street



(This question continues on the following page)



(Question 5 continued)

- (a) List **two** ways designers visualize their design concepts.

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- (b) Explain how converging technologies contribute to eco-design.

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(Question 5 continued)

- (c) Life cycle analysis (LCA) is a tool that assesses the impact of a product on the environment.

Explain how the environmental impact can be minimized during production **and** disposal of the Smart Cane.

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(Question 5 continued)

- (d) Explain how sustaining innovation, disruptive innovation **and** process innovation apply to the development of the Smart Cane.

[9]



6. The Lottie Dolls were developed by Science, Technology, Engineering and Maths (STEM) education experts to show females in professional situations (see **Figure 5**).

Lottie's main doll body is manufactured from acrylonitrile butadiene styrene (ABS). The clothes and accessories from other plastics. This material combination makes the dolls robust for children to play with.

Figure 5: Lottie STEM Young Inventor Engineering Toy



- (a) Outline why assembly drawings are suitable for communicating with the dolls' manufacturer.

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(Question 6 continued)

(b) Explain **one** target audience for the Lottie Doll.

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(Question 6 continued)

- (c) Explain **two** reasons why a physical scale model would be used in the development of the Lottie Doll.

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(d) Explain how the mechanical properties, physical properties and aesthetic characteristics of ABS plastic make it suitable for The Lottie Doll.



Turn over

7. Because International is an international charitable organization who design affordable shoes that help keep children's feet protected against the elements, and adapt to a growing child's feet, see **Figure 6**.

Developed for children who are impacted by poverty, 'The Shoe That Grows' expands five sizes and lasts for years, see **Figure 6**.

Figure 6: Expandability of The Shoe That Grows



The shoes' adjustable straps are attached to a compressed rubber sole with high-grade Velcro (**Figure 7**) without the need for any mechanical parts. The antibacterial synthetic upper helps to care for the growing shoes which are easy to clean, maintain and use.

Figure 7: The Shoe That Grows, close up of the Velcro straps



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(Question 7 continued)

Since the charity was set up in 2014, it has created 400 000 pairs of The Shoe That Grows for children and families worldwide. The website has been designed so that people can donate the shoes to children who need them.

- (a) List **two** physical, mechanical or aesthetic properties of rubber. [2]

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- (b) Explain why prototypes would be used in the design and development of the Because International designers. [3]

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(Question 7 continued)

- (c) Explain how the designer can reduce the environmental impact of The Shoe That Grows through the consideration of materials **and** waste.

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(d) Explain how Rogers' characteristics of relative advantage, compatibility **and** observability help in the diffusion of The Shoe That Grows shoes.



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References:

Figure 1: With permission from Common Object Studio.

Figure 2: Daderot. https://commons.wikimedia.org/wiki/File:Type_1227_desk_lamp,_Anglepoise,_designed_by_George_Carwardine,_manufactured_by_Herbert_Terry_and_Sons,_1935_-_Design_Museum,_Kensington_-_London_-_DSC01571.jpg. Public domain image, licensed under CC0 1.0 <https://creativecommons.org/publicdomain/zero/1.0/deed.en>. Source adapted.

Figure 3: With permission from Saksham Trust.

Figure 4: With permission from Saksham Trust.

Figure 5: With permission from Lottie Dolls.

Figure 6: With permission from Because International.

Figure 7: With permission from Because International.

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