



NSW Education Standards Authority

2020 HIGHER SCHOOL CERTIFICATE EXAMINATION

Design and Technology

**General
Instructions**

- Reading time – 5 minutes
- Working time – 1 hour and 30 minutes
- Write using black pen

**Total marks:
40**

Section I – 10 marks (pages 2–4)

- Attempt Questions 1–10
- Allow about 15 minutes for this section

Section II – 15 marks (pages 5–8)

- Attempt Questions 11–12
- Allow about 35 minutes for this section

Section III – 15 marks (pages 9–12)

- Attempt Question 13
- Allow about 40 minutes for this section

Section I

10 marks

Attempt Questions 1–10

Allow about 15 minutes for this section

Use the multiple-choice answer sheet for Questions 1–10.

- 1** Which of the following best describes *ergonomics*?
- A. The study of human body measurement
 - B. The design of products to satisfy a niche market
 - C. Design factors to consider in developing energy-efficient products
 - D. The study of how people work efficiently within their physical environment
- 2** What are designers aiming to determine first, when they carry out research prior to designing a new product?
- A. The level of consumer need and demand
 - B. Suitable pricing and marketing strategies
 - C. The range of existing products and pending patents
 - D. The level of consumer acceptance of using innovative technologies
- 3** An urban planner has been commissioned to design a new housing estate.
- Which factors would the planner initially need to consider when establishing the design brief?
- A. The developer's needs and constraints
 - B. The required infrastructure and community facilities
 - C. The size of the development and possible styles of housing
 - D. The location of the nearest major city and access to public transport
- 4** Which of the following best describes the primary aim of using sustainable practices?
- A. To reduce global warming
 - B. To address climate change
 - C. To ensure that natural resources are available in the future
 - D. To only use materials that are either recyclable or biodegradable

- 5** A designer has developed an energy-efficient battery-powered home appliance.
- Which of the following is most likely to contribute to the success of the appliance?
- A. Attractive design features
 - B. Convenience of portable appliances
 - C. Growing social trend to use innovative products
 - D. Increased demands on time in managing household chores
- 6** Which of the following has had the greatest impact on the working practices of designers?
- A. Changes in consumer needs
 - B. Ease of travel and flexible working conditions
 - C. Access to technologies with greater capabilities
 - D. Cost-effective communication systems and workplace opportunities
- 7** How could a designer best ensure minimal impact on the environment when developing a new product?
- A. Undertake a life-cycle analysis
 - B. Adopt a focus on the use of green technology
 - C. Implement a system for recycling production waste
 - D. Limit the material waste during the production process
- 8** Which of the following has contributed to an increase in the use of social media for researching information?
- A. Affordability and convenience
 - B. The ability to capture, store and use instant real-time data
 - C. A greater number of people have access to this form of technology
 - D. The growing ownership of mobile phones with innovative app features

- 9** Which strategy should a small company use when deciding whether to adopt a new technology?
- A. Continue to invest in the latest technology while deciding
 - B. Spend more time and money on staff training and development
 - C. Determine the percentage return of the investment in the new technology
 - D. Compare the cost and efficiency of the new technology with current practices

- 10** Struggling businesses are often forced to diversify to remain viable.

This has resulted in businesses needing to design and develop

- A. infrastructure to improve production output.
- B. systems to manage activities in order to meet consumer demands.
- C. a detailed life-cycle analysis of all operations to address consumer interests.
- D. innovative management practices that improve output to reduce environmental impact.

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Centre Number

Design and Technology

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Student Number

Sections II and III Answer Booklet

Instructions

- Write your Centre Number and Student Number at the top of this page.
- Use this answer booklet for Sections II and III.
- Follow the instructions inside this booklet as to where you should write your answers.

Please turn over

Section II

15 marks

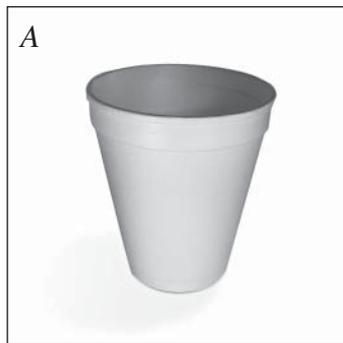
Attempt Questions 11–12

Allow about 35 minutes for this section

Answer the questions in the spaces provided. These spaces provide guidance for the expected length of response.

Question 11 (9 marks)

Take-away hot drinks can be provided in a variety of cups, four of which are shown.



Polystyrene foam



Rippled paper with a plastic lid



Glass with rubber lid and band



Double-wall stainless steel with a clear plastic lid

- (a) With reference to ONE of these cups, outline how the designer could protect their intellectual property. 2

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Question 11 continues on page 7

Do NOT write in this area.

Question 11 (continued)

- (b) Describe a positive design feature and a negative design feature of ONE of the cups shown. 3

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- (c) Explain how environmental factors may have influenced social acceptance of using cups such as those labelled *C* and *D*. 4

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End of Question 11

