



NSW Education Standards Authority

**2021** HIGHER SCHOOL CERTIFICATE EXAMINATION

# Design and Technology

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**General  
Instructions**

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

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**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 5–9)

- Attempt Questions 11–13
- Allow about 35 minutes for this section

**Section III – 15 marks** (pages 10–13)

- Attempt Question 14
- 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.

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- 1** A design professional reviews a product that you have created and makes the comment that ‘your product is really beautiful’.

To which of the following factors of design does this comment best relate?

- A. Aesthetics
  - B. Ergonomics
  - C. Function
  - D. Quality
- 2** Which of the following best describes an effective process for developing design solutions?
- A. A method of analysing a product’s development
  - B. A series of steps to manage time, actions and finance
  - C. A method of manufacturing products, systems or environments
  - D. A series of steps to transform an idea into a working and viable product
- 3** A life cycle analysis is NOT used to evaluate a product’s
- A. chances of success.
  - B. marketing strategies.
  - C. ability to meet a design brief.
  - D. potential for future innovation.
- 4** What is the purpose of protecting intellectual property?
- A. To increase profit margins for designers
  - B. To ensure safeguards for consumer rights
  - C. To help distribute consumer products more widely
  - D. To allow designers greater control over their ideas

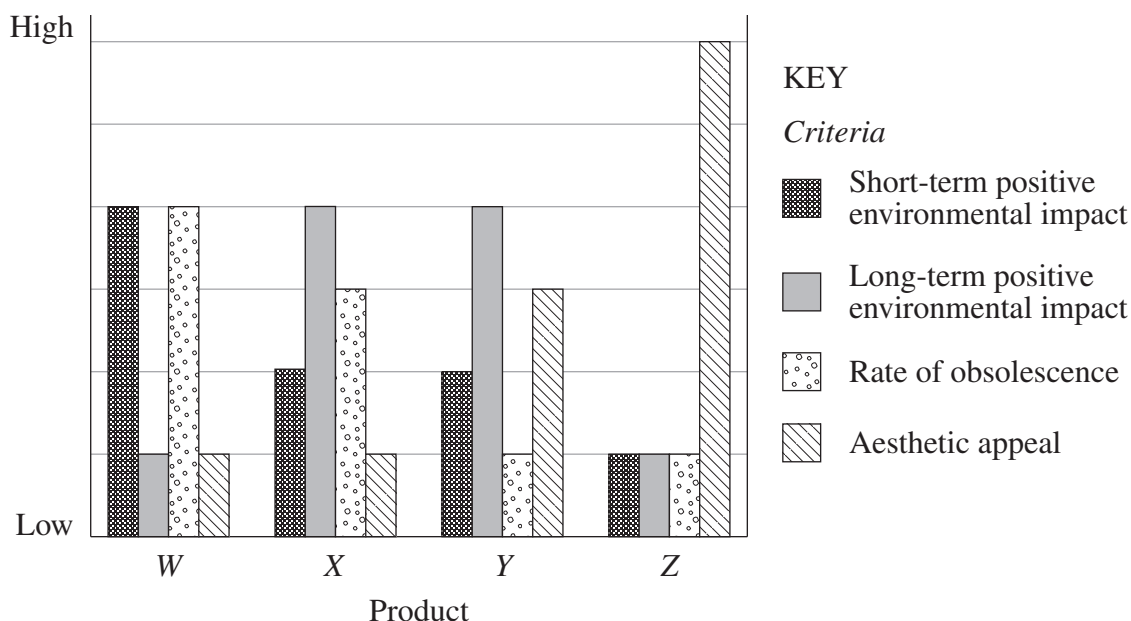
- 5 What role does the designer have when considering the economic impact of new designs on the community?
- A. To respond to social change and use new technologies that reduce cost
  - B. To use environmentally friendly materials throughout the production process
  - C. To consider the positive and negative issues of design decisions to increase profit margins
  - D. To develop new products with a limited life span in order to reduce costs of manufacturing
- 6 Which of the following contributes to the development of an efficient and sustainable product?
- A. Timing the release of a product to market
  - B. Ensuring that the loss of natural resources is considered
  - C. Producing quality products that reflect and align with society's needs
  - D. Effective time management, planning and evaluation throughout product development
- 7 There has been a growing trend towards a cashless and paperless society due to technological advances which support, for example, the use of transport cards, digital subscriptions and contactless payments.
- Which of the following is a direct benefit of this trend to the consumer?
- A. Increased sales
  - B. Greater privacy
  - C. Greater convenience
  - D. A greener environment
- 8 What ethical action should be taken by designers when developing a product that uses synthetic materials rather than natural resources?
- A. Develop a returns policy for consumers
  - B. Inform consumers of the materials used
  - C. Promote the lack of environmental damage that has occurred from using synthetic materials
  - D. Assure consumers that the chemical composition and appearance of natural and synthetic materials are the same

- 9 Four products were created in response to the following brief:

‘Design a new product that has the most positive outcome for future generations.’

These four products (W, X, Y and Z) were evaluated by a panel of expert designers.

The following graph shows how the expert designers rated each product based on four criteria.



Based on the results shown, which product best responds to the design brief?

- A. W
  - B. X
  - C. Y
  - D. Z
- 10 What is most likely to occur if emerging technologies and sustainable practices fail to align?
- A. Growth in environmental concern will be limited.
  - B. Global economies will stagnate as innovation ceases to occur.
  - C. Political intervention will limit the research and development of design ideas.
  - D. An imbalance between innovative human endeavours and maintaining the natural environment will result.

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Centre Number

## Design and Technology

### Sections II and III

### Answer Booklet

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Student Number

#### 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 11–13**

**Allow about 35 minutes for this section**

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

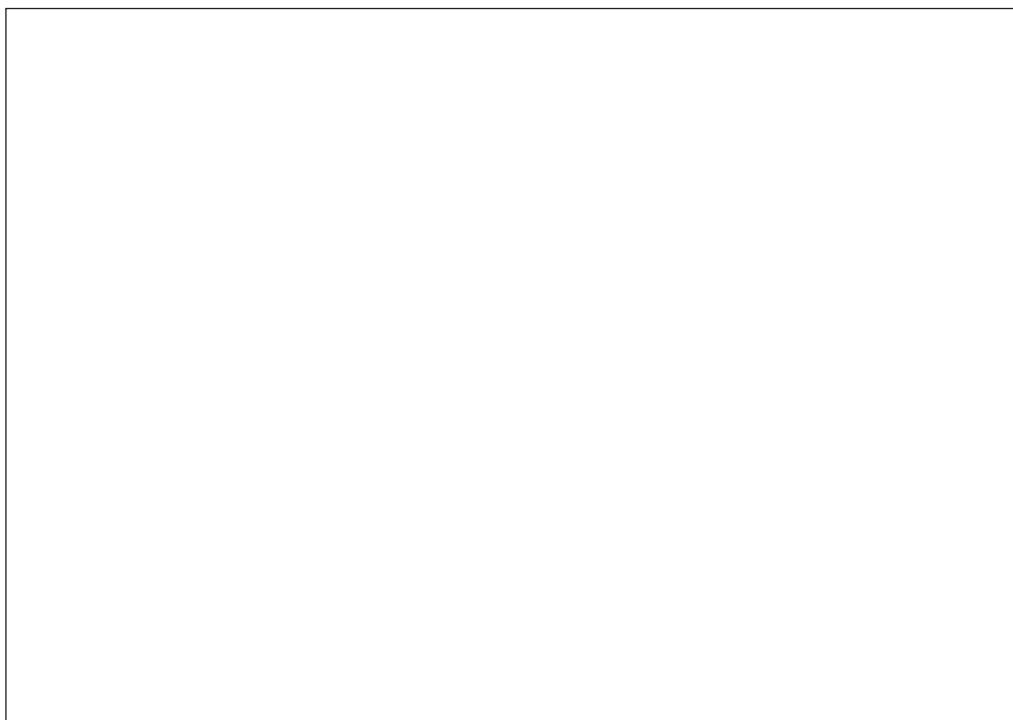
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### **Question 11** (5 marks)

Employers are committed to keeping staff safe in the workplace through the use of personal protective equipment (PPE).

Consider ONE article of PPE that is commonly used in the workplace and answer parts (a) and (b) with reference to this article.

- (a) Draw an annotated sketch of an article of PPE that is commonly used in the workplace. **2**



**Question 11 continues on page 7**

Question 11 (continued)

- (b) A designer has been given the brief to make this article of PPE more acceptable to the user.

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Describe how the designer can respond to the brief.

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**End of Question 11**

**Please turn over**

**Question 12** (4 marks)

Changes to current work practices can affect a designer.

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Describe a positive effect and a negative effect of ONE change to work practices.

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**Question 13** (6 marks)

Explain why the designer of a new product should consider the needs of society.

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### Section III

15 marks

Attempt Question 14

Allow about 40 minutes for this section

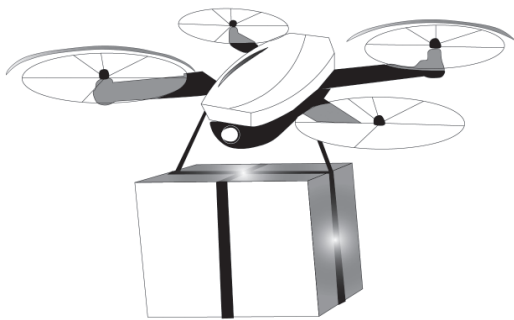
Answer the question in the space provided. This space provides guidance for the expected length of response.

Your answer will be assessed on how well you:

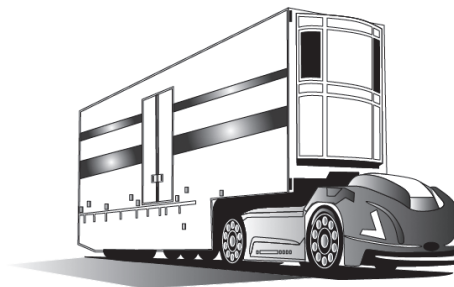
- demonstrate knowledge and understanding relevant to the question
- communicate ideas and information using relevant examples
- present a logical and cohesive response

#### Question 14 (15 marks)

The images below illustrate two innovative transport systems which have been developed with the aid of emerging technologies.



Delivery drone



Driverless truck

Analyse the legal issues and the economic issues that may arise due to the increased use of these innovative systems.

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Question 14 continues on page 11

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– 11 –

[illegible]

– 12 –

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– 13 –

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