

BOARD OF STUDIES
NEW SOUTH WALES

2008

**HIGHER SCHOOL CERTIFICATE
EXAMINATION**

Design and Technology

General Instructions

- Reading time – 5 minutes
- Working time – $1\frac{1}{2}$ hours
- Write using black or blue pen
- Write your Centre Number and Student Number at the top of page 5

Total marks – 40

Section I Pages 2–4

10 marks

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

Section II Pages 5–8

15 marks

- Attempt Question 11
- Allow about 35 minutes for this section

Section III Pages 9–10

15 marks

- Attempt ONE question from Questions 12–14
- 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.

- 1 What is the purpose of conducting market research before developing a new product?
 - (A) To devise an advertising campaign
 - (B) To determine if there is a need for the product
 - (C) To determine where to manufacture the product
 - (D) To increase community awareness of the company's product range

- 2 Which of the following activities is most appropriate to a creative design process?
 - (A) Writing a brief
 - (B) Conducting a brainstorming session
 - (C) Using computer aided design (CAD)
 - (D) Developing a Gantt chart

- 3 Which of the following will lead to the most efficient production of a product?
 - (A) Having a range of tools and equipment
 - (B) Using machine processes as much as possible
 - (C) Developing a time plan to coordinate all production activities
 - (D) Researching to gain knowledge and experimenting about processes involved

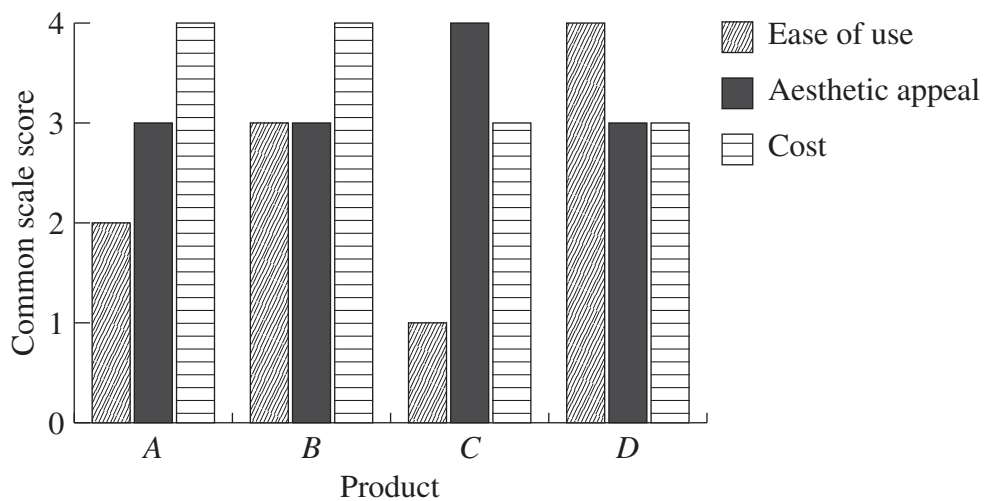
- 4 What legal measure is most appropriate to protect your design innovations?
 - (A) Obtaining a design patent
 - (B) Copyrighting the product
 - (C) Seeking a provisional patent
 - (D) Obtaining a trademark for the design

5 Kim's budget is found to be insufficient to complete a project as was originally intended.

What is the likely cause of this situation?

- (A) The action plan was incomplete.
- (B) A material supplier could not be found.
- (C) The product did not have ongoing evaluation.
- (D) The budgeting and financial planning were inadequate.

6 Four products (*A*, *B*, *C* and *D*) were assessed on three criteria. The graph shows the results of this assessment.



If cost were disregarded, which product would a designer recommend?

- (A) *A*
- (B) *B*
- (C) *C*
- (D) *D*

7 A designer has been asked to develop a product that complies with ergonomic principles.

What is a core responsibility of this designer?

- (A) To ensure that new technology is used
- (B) To enable a manufacturer to make the design
- (C) To ensure that the design can be easily and safely used
- (D) To ensure that users understand the technology found in the product

- 8** A design company is successful in areas as diverse as electronics, aircraft, banking systems and marketing.

What is most likely to have contributed to this success?

- (A) Employing efficient management structures that reduce its costs
- (B) Having offices scattered around the world so it is able to liaise frequently with clients
- (C) Following a process of design including research, experimentation, creativity and innovation
- (D) Spending a long time investigating the needs of its clients and applying principles of sustainability

- 9** How can a designer best reduce the total cost of a product?

- (A) Find a cheaper labour source
- (B) Design the product so it needs fewer parts
- (C) Design the product using a different material
- (D) Manufacture the product using another technique

- 10** Designers often create designs that do NOT proceed to production but are used for a different purpose. Examples are concept cars, catwalk fashions, advertising images.

What is the purpose of these designs?

- (A) To develop future products
- (B) To redesign their existing range of products
- (C) To put the skills of the production team on public display
- (D) To reintroduce a product that the company did not put into production

Design and Technology

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Centre Number

Section II

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Student Number

15 marks

Attempt Question 11

Allow about 35 minutes for this section

Answer the questions in the spaces provided.

Marks

Question 11 (15 marks)

(a) Outline the impact of cost as a factor in designing.

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Question 11 continues on page 6

Question 11 (continued)



- (b) Compare the function and aesthetics of Chair 1 with those of Chair 2. **3**

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Question 11 continues on page 7

Question 11 (continued)

- (c) Explain the importance of ergonomics when considering both functional and aesthetic aspects in the design of successful products. 4

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Question 11 continues on page 8

Question 11 (continued)

(d) How does the interaction between individuals and designers affect the success or failure of a design?

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End of Question 11

Design and Technology

Section III

15 marks

Attempt ONE question from Questions 12–14

Allow about 40 minutes for this section

Answer the question in a writing booklet. Extra writing booklets are available.

Marks

Question 12 (15 marks)

Electricity can be generated from a variety of sources, such as:

- nuclear energy
- solar panels
- hydro electric power
- wind turbine
- biomass
- tidal movement
- wave generation
- clean coal technology

- (a) Explain the environmental issues considered during the design and production of innovative methods of generating electricity using examples from the above list. **6**
- (b) Analyse how social and ethical factors influence the development of innovations. **9**

OR

Question 13 (15 marks)

‘Keep the change’ is an innovative approach to saving developed by IDEO for Bank of America. It involves a debit card, which when used to pay for products will round up the cost to the nearest dollar amount. The extra few cents are directed to the users’ bank accounts as savings, thus helping people save money over the long run.

For example, a product is purchased for \$49.50. The product is charged at \$50.00 and the difference of 50 cents is transferred to the user’s account.

- (a) The IDEO innovation is a response by designers to a changing trend in society where people no longer visit banks to deposit money for savings. **6**

Explain how the activities of designers change in response to trends in society, giving examples like the ‘keep the change’ innovation.

- (b) Analyse how the development of new technologies is affected by social and economic change. **9**

OR

Question 14 (15 marks)

The ‘one laptop per child’ initiative of the developed world is one strategy to assist students in developing nations. This provides greater access to educational tools.

The laptop could have a wind-up handle to allow it to run without batteries or an electrical supply. Wireless antennas will provide connectivity to other laptops and the internet. Speakers will provide audio output. USB sockets will allow for the storage of data.

One implementation strategy is to allow a person in a developed nation to purchase a laptop at double the price so that another laptop can be provided at no cost to a student in a developing nation.

- (a) Explain how the ‘one laptop per child’ initiative meets needs in both developing and developed nations. **6**

- (b) Analyse how new technologies can impact on society and culture. **9**

End of paper

– 10 –