

B O A R D O F S T U D I E S
NEW SOUTH WALES

2005

**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 9

Total marks – 40

Section I Pages 2–5

10 marks

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

Section II Pages 9–12

15 marks

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

Section III Pages 13–15

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.

Select the alternative A, B, C or D that best answers the question. Fill in the response oval completely.

Sample: $2 + 4 =$ (A) 2 (B) 6 (C) 8 (D) 9
A B C D

If you think you have made a mistake, put a cross through the incorrect answer and fill in the new answer.

A B C D

If you change your mind and have crossed out what you consider to be the correct answer, then indicate the correct answer by writing the word *correct* and drawing an arrow as follows.

A B C D
correct
↙

- 1 Which of the following communication tools is most suitable when developing initial design ideas?
 - (A) 3D CAD model
 - (B) Series of foam models
 - (C) Quality appearance model
 - (D) Quick freehand sketches and notes

- 2 Which of the following should be done by an ethical designer when designing a new product?
 - (A) Slightly vary an existing design, then claim it is new.
 - (B) Manufacture in a country that does not have patent laws.
 - (C) Creatively resolve issues existing products do not address.
 - (D) Copy the features of existing products, but make slight changes to the shape.

- 3 Which of the following is likely to result in a successful innovation?
 - (A) Market needs are identified.
 - (B) Advertising of the innovation is convincing.
 - (C) Innovation is creative and clever.
 - (D) People can afford the new technology.

- 4 Research utilising focus groups can be used to aid the design process.
When is it best to use this type of research?
 - (A) Before a brief is given to the designers
 - (B) Ongoing throughout the design process
 - (C) After a working prototype has been made
 - (D) After the product has been manufactured but before it is marketed

- 5 Which of the following should a designer consider as being a key and integral part of the design process?
 - (A) Recycling
 - (B) Material selection
 - (C) Life-cycle analysis
 - (D) Energy required to manufacture

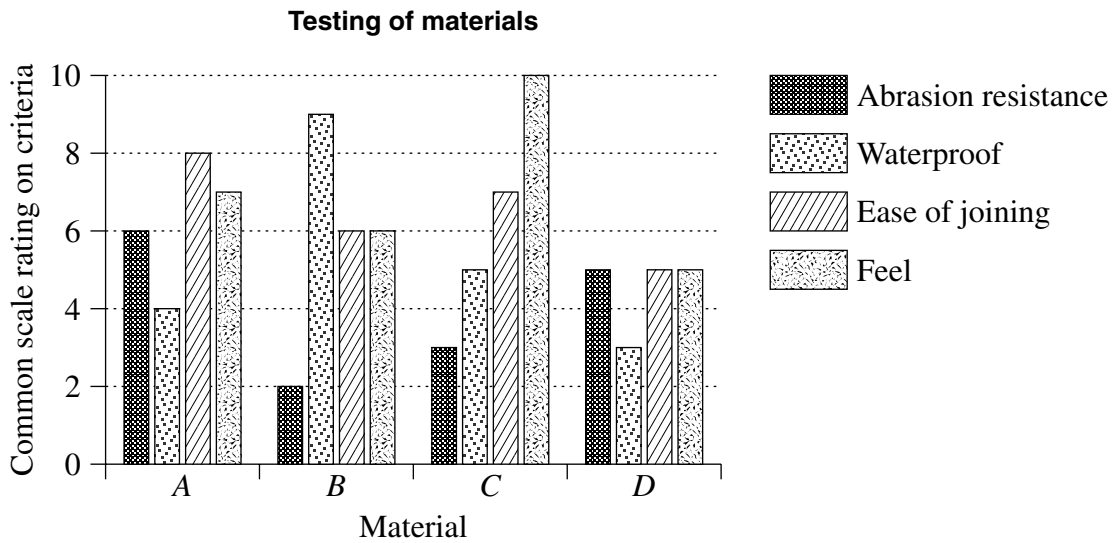
6 A designer has been asked to design a system to re-use household water. When developing a design concept, which of the following will the designer need to consider first?

- (A) Aesthetic qualities
- (B) Final cost of materials
- (C) Local government regulations
- (D) How recycled materials can be utilised

7 A designer requires a material that meets the following criteria in decreasing order of importance:

- abrasion resistance
- waterproof
- ease of joining

The following graph shows results after testing four materials.



Based on the above information, which material should be selected?

- (A) Material A
- (B) Material B
- (C) Material C
- (D) Material D

- 8** Why is ongoing project evaluation an important component in managing the design process?
- (A) It saves the designer wasting non-renewable resources.
 - (B) It ensures the final project will meet the needs of the designer.
 - (C) It allows the client to give the designer feedback after each stage.
 - (D) It gives the designer the opportunity to check that designated timelines are being met.
- 9** Innovations and technological change assist in the development of new products that help society.
- Which of the following factors would be the most significant consideration for a designer?
- (A) The manufacturer can make the design.
 - (B) The design can be easily and safely used.
 - (C) The product always uses only the new technology.
 - (D) The users understand the new technology found within the new product.
- 10** A socially responsible designer would do which of the following?
- (A) Try to change society by developing new products.
 - (B) React to social change and new technology by being innovative.
 - (C) Analyse the impacts of design decisions and come to a conclusion.
 - (D) Create opportunities in society for new technologies to be developed.

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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

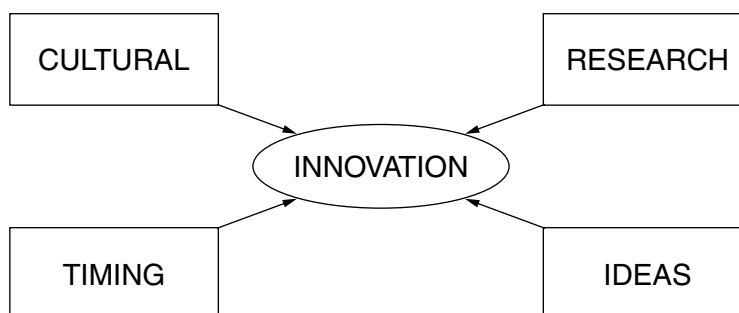
Answer the questions in the spaces provided.

Question 11 (15 marks)

Please turn over

Question 11 (15 marks)

- (a) The diagram below shows some of the factors that impact on successful innovation.



- (i) The legal protection of ideas is an important factor affecting successful innovation. **2**

Outline how intellectual property can be protected.

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- (ii) Select TWO factors from the diagram and outline their impact on successful innovation. **3**

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Question 11 continues on page 11

Question 11 (continued)

- (b) (i) When identifying the need for a new product, system or environment, how are designers influenced by entrepreneurs? **2**

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- (ii) Compare the roles played by entrepreneurs and designers in the development or realisation of successful innovations. **3**

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Question 11 continues on page 12

Question 11 (continued)

- (c) Discuss ethical and sustainability issues in the development and impact of an innovation you have studied.

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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)

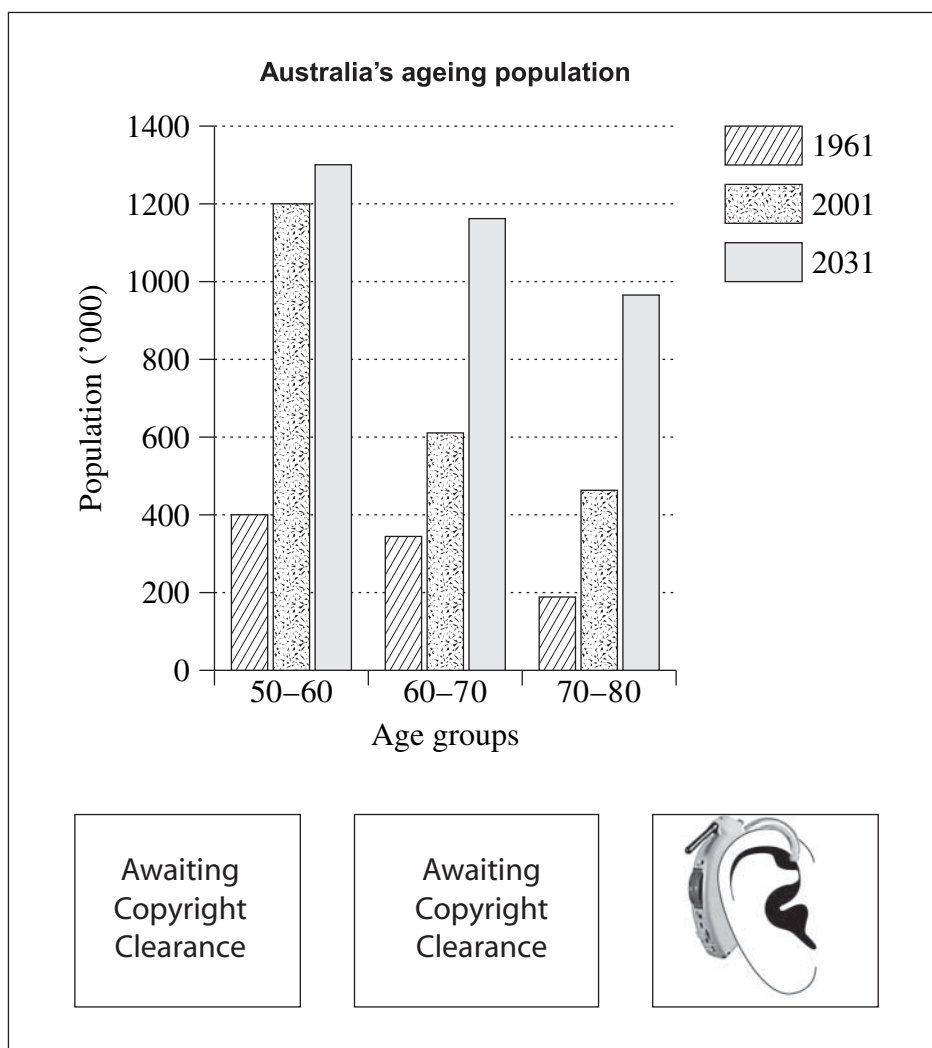
The human nose is a versatile and portable odour detector. Artificial odour detectors have been developed since the 1950s, with limited success. Recent developments in technology have enabled electronic sensors to detect and recognise odours. This emerging technology is described in the following diagram.



- (a) Describe a new product that could utilise the technology described in the diagram, and predict the impact of this technology on future innovations. **6**
- (b) For the new product you described in part (a), identify a potential user group. Analyse the impact your proposed product would have on society by considering issues such as economic, social, legal, or ethical issues. **9**

OR

Question 13 (15 marks)



Awaiting
Copyright
Clearance

Awaiting
Copyright
Clearance



Australia's ageing population is a major focus for social and economic planners.

- (a) Explain the technological changes that could be made to the nature of work to enable people to have a longer working life. 6
- (b) Outline products or services designed to meet the needs of the ageing population. Discuss how technological change and global issues influence the development of those products or services you have outlined. 9

OR

Question 14 (15 marks)



- (a) Designers' decisions affect the quality of products, systems or environments. Using examples from above, explain how durability and reliability influence these decisions. 6
- (b) Products can become obsolete because they are no longer fashionable, or they utilise technology that has been replaced. Analyse these two reasons for obsolescence. Include in your answer advantages and disadvantages for consumers in products becoming obsolete. 9

End of paper

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