

BOARD OF STUDIES
NEW SOUTH WALES

2001 HSC Specimen Paper

Design and Technology

ACKNOWLEDGEMENTS

Question 11 (d) – Text: ‘Old Tyres Transformed into New Products’, Tomorrow’s World, the Australian Initiative, Associated Publishing Corporation, 1995

Question 12 – Comment: Competing by design, The National Design Review, 1995

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Design and Technology

Introduction

This booklet contains the specimen examination paper for the 2001 Higher School Certificate examination in Design and Technology. A mapping grid is also included, showing how each question in the examination relates to the syllabus outcomes and content, and to the performance bands.

The specimen paper shows the format of the New HSC examination. It has been printed on A4 paper and side-stapled to make it convenient for use in schools. Actual examination papers will be produced as A4 booklets. All New HSC papers will be printed on white paper.

The 2001 HSC specimen papers have been produced in accordance with the Board's *Principles for Setting HSC Examinations in a Standards-Referenced Framework*, published in Board Bulletin Volume 8 Number 9 (Nov/Dec 99). Questions are closely related to the outcomes of the course, and the paper as a whole is structured to allow for appropriate differentiation of student performance at all levels on the performance scale.

The papers have been designed so that students have a clear understanding of what they are required to do in each question and in working through the paper. Instructions have been standardised, and the demands of the questions have been made explicit. Key words in questions, such as 'discuss', 'analyse', and 'explain', have been used consistently in accordance with the glossary published in the Board's *Assessment Support Document*.

This specimen paper is an example of the type of examination that could be prepared within the examination specifications in the Design and Technology syllabus. Examinations will be based on the syllabus, and will test a representative sample of syllabus outcomes. Therefore, the range and balance of outcomes tested in HSC examinations in 2001 and subsequent years may differ from those addressed in the specimen paper.

The mapping grid is an important feature of the development of the examination. It aids in ensuring that the examination as a whole samples a range of content and outcomes, and allows all students the opportunity to demonstrate their level of achievement. Where courses have components in the examination other than written papers, the grid indicates the wider range of outcomes that are assessed by including these other components.

There are a number of points to note in considering the Design and Technology specimen paper:

- The number of parts to the questions has been kept to a minimum. The questions now require more integrated answers, giving students the opportunity to show higher-order thinking skills.
- In Section II, the number of parts in the questions and the marks allocated may vary from year to year.

- In Section III, where students have a choice of questions, the questions all have a similar structure to aid in ensuring comparability across these questions. However, in subsequent examinations, the style and structure of the questions may differ from those in the specimen paper.

Design and Technology

HSC Specimen Examination Mapping Grid

For each item in the examination, the grid shows the marks allocated, the syllabus content and syllabus outcomes it relates to, and the bands on the performance scale it is targeting. The range of bands shown indicates the performance candidates may be able to demonstrate in their responses. That is, if an item is shown as targeting Bands 3 – 5, it indicates that candidates who demonstrate performance equivalent to the Band 3 descriptions should be able to score some marks on the item, while those who perform at Band 5 or above could reasonably be expected to gain high marks. In the case of one-mark items, candidates who demonstrate performance at or above the bands shown generally could be expected to answer the item correctly.

Question	Marks	Content	Syllabus outcomes	Targeted performance bands
1	1	Practices and processes of designers – factors affecting design	H1.1, H1.2	3 – 4
2	1	Practices and processes of designers – protection of intellectual property	H1.2, H2.2	2 – 3
3	1	Needs Analysis / Market Research	H4.1	2 – 3
4	1	Marketing	H3.1	3 – 4
5	1	Trends in designing and producing	H2.1, H6.2	4 – 5
6	1	Factors affecting design – sustainability	H1.1	2 – 3
7	1	Practices and processes of designers – evaluation	H1.2	3 – 4
8	1	Practices and processes of designers – collaborative work practices	H5.1, H6.1	3 – 4
9	1	Practices and processes of designers – quality control	H1.2	4 – 5
10	1	Factors affecting design – obsolescence	H1.1	3 – 4
11(a)	1	Ethical issues – intellectual property	H2.2	2 – 3
11(b)	3	Factors affecting design – aesthetics	H1.1	3 – 4
11(c)	2	Historical and cultural influences on designing and producing	H2.1	2 – 4
11(d)(i)	1	Innovation – nature of	H3.1	2 – 3
11(d)(ii)	1	Innovation – factors influencing	H3.1	2 – 3
11(e)	2	Innovation – impact of emerging technologies	H3.1	2 – 4
11(f)	5	Innovation – environmental considerations	H2.2, H6.2	2 – 5
12(a)	5	Ethical and environmental considerations for designers – health and safety	H1.1, H1.2, H2.2	2 – 4
12(b)	10	Ethical and environmental considerations for designers – health and safety	H1.1, H1.2, H2.2	2 – 6
13(a)	5	Factors affecting design – functional criteria	H1.1	2 – 4
13(b)	10	Ethical considerations for designers	H1.2, H2.2	2 – 6
14(a)	5	Impact of emerging technologies on the individual and society	H6.2	2 – 4
14(b)	10	Legal implications	H2.2, H6.2	2 – 6

Major Design Project				
Component	Marks	Criteria	Syllabus outcomes	Targeted performance bands
Project proposal and project management	15	Identification and exploration of need Areas of investigation Criteria to evaluate success Action, time and finance plans and their application Selection and use of ideas and resources	H1.2, H4.1, H4.2, H5.1, H5.2	2 – 6
Project development and realisation	35	Evidence of creativity Consideration of design factors Documentation of research, experimentation and testing Application of conclusions Identification and justification of ideas and resources Evidence of testing of design solutions and application of conclusions Evidence and application of practical skills Consideration of practices in industrial/commercial settings	H1.2, H2.1, H3.2, H4.2, H5.1, H5.2, H6.1	2 – 6
Evaluation	10	Record and application of evaluation procedures Analysis and evaluation of functional and aesthetic aspects of design Final evaluation with respect to project proposal and project's impact on society and the environment Relationship of final product, system or environment to the project proposal	H1.2, H4.2, H4.3, H5.1	2 – 6



Sample marking guidelines for Design and Technology

The following marking guidelines have been developed for selected questions from the 2001 HSC Specimen Examination in Design and Technology. These guidelines indicate the approach that would be taken to marking questions.

For each question, the following are typically included:

1. The syllabus outcomes that are targeted by the question.
2. The assessment rubric from the specimen paper, where there is one, listing the set of general criteria that are used to assess responses.
3. The marking guidelines, which show the criteria to be applied to responses along with the marks to be awarded in line with the quality of the responses. For extended-response questions, performance is described at a number of levels of performance, each covering a range of marks.
4. A sample answer or some points that answers might include. Sample answers indicate the scope and depth of treatment expected, and are not intended to be prescriptive. Similarly, the points that could be included in answers are not intended to be an exhaustive list, but rather an indication of the considerations that students could include in their responses.

Marking guidelines will generally require some refinement at the Marking Centre to take account of unanticipated responses that students present. For essay-type questions, the standard described at each mark range will be made clear during pilot-marking by the selection of sample scripts.

In a standards-referenced framework, examination questions are closely linked to syllabus content and outcomes. Expectations of the question are to be clear in the wording of the question. Marking guidelines will be developed at the same time as the examination questions, by examination committees. The development of marking guidelines will be guided by the Board's *Principles for Developing Marking Guidelines Examinations in a Standards-Referenced Framework*, published in Board Bulletin Volume 9 Number 3 (May 2000).

Sample Marking Guidelines – Design and Technology

Marks

Question 12 (15 marks)

‘Best practice in design can only exist if it focuses on people and builds in health and safety considerations.’

- (a) Explain how health and safety considerations have been addressed in a design you have studied. **5**

Outcomes assessed: H1.1, H1.2, H2.2

MARKING GUIDELINES

Criteria	Marks
<ul style="list-style-type: none">Clearly explains how health and safety considerations have been addressed in a design they have studiedSupports their explanation with a range of appropriate examples or an in-depth analysis of one or two appropriate examples	4 – 5
<ul style="list-style-type: none">Explains in general terms how health and safety considerations have been addressed in a design they have studiedIncludes some supporting evidence for their explanation from one or two appropriate examples	2 – 3
<ul style="list-style-type: none">Describes a health or safety feature relevant to the studied design	1

Answers could include:

In a building design studied, health and safety features may be:

- natural and artificial lighting
- ventilation
- floor design, obstacles
- door design

In a book designed for young children, health and safety features may be:

- print size
- size and weight of the book
- method of binding
- pop-up or other detachables

	Marks
(b) Discuss the importance of designers addressing health and safety considerations in their designs.	10

Outcome assessed: H1.1, H1.2, H2.2

MARKING GUIDELINES

Criteria	Marks
<ul style="list-style-type: none"> • Explains why designers need to consider health and safety considerations in their designs • Supports their discussion by relating a range of appropriate examples illustrating the importance of designers addressing health and safety considerations in their designs 	9 – 10
<ul style="list-style-type: none"> • Identifies a few reasons why designers need to consider health and safety considerations in their designs • Supports their discussion by relating several appropriate examples illustrating the importance of designers addressing health and safety considerations in their designs 	7 – 8
<ul style="list-style-type: none"> • Describes several health and safety issues in designs • Describes a few examples illustrating the importance of designers addressing health and safety considerations in their designs 	5 – 6
<ul style="list-style-type: none"> • Describes a health and a safety issue in designs • Gives a general explanation of their importance 	3 – 4
<ul style="list-style-type: none"> • Describes a health and/or safety issue in a design 	1 – 2

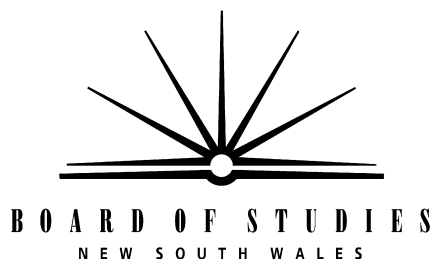
Answers could include:

Issues identified in relation to health and safety:

- government legislation
- Australian Standards
- litigation trends

Factors influencing the ways designers address health and safety considerations:

- moral, legal, ethical and professional responsibilities
- function and aesthetics
- cost



Sample marking guidelines for the Major Design Project in Design and Technology

The following sample marking guidelines have been developed for the Major Design Project component of the HSC Examination in Design and Technology. In conjunction with the previously published sample marking guidelines for selected questions from the 2001 HSC Specimen Examination paper, they indicate the approach that would be taken to marking student responses for the entire examination.

For the practical component(s) of the examination, the following are included:

1. A description of the task, derived from the syllabus
2. The syllabus outcomes that are assessed by the task
3. The criteria, derived from the outcomes, that are used to assess the task
4. The marking guidelines for each component of the task

The marking guidelines describe the full range of performance typically demonstrated by students. Descriptions are given for ranges of marks, representing performances at different levels of achievement. In marking a response, the marker initially assigns it to one of these levels, and the judgement is then refined to decide on the mark to be awarded. Markers use a variety of strategies, including sample responses, to assist them in this process.

For the HSC examinations in 2001 and beyond, marking guidelines for all parts of the examination will be developed by the examination committee. The development of marking guidelines will be guided by the Board's *Principles for Developing Marking Guidelines in a Standards-Referenced Framework*, published in Board Bulletin Volume 9 Number 3 (May 2000).

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HSC Examination Overview

The HSC examination for Design and Technology consists of a written paper worth 40 marks and a Major Design Project worth 60 marks.

Task: Major Design Project (60 marks)

Each student must undertake, on an individual basis, a Major Design Project for submission for the Higher School Certificate examination. The Major Design Project includes the practical hands-on activity of carrying the project through to realisation and the documentation, in a folio, of all the steps involved in this process. The Major Design Project is not to be used for internal or external assessment in any other subject.

The Major Design Project involves students selecting and applying appropriate design, production and evaluation skills to a product, system or environment, which satisfies an identified need or opportunity. Students have developed a wide range of skills and knowledge in the Preliminary course, and in the HSC course are able to select and use those skills and knowledge appropriate to their selected project. Where appropriate, students relate the techniques and technologies used in industrial and commercial settings to those used in the development of their Major Design Project.

The Major Design Project will include the submission of:

- a folio documenting the project proposal and project management, project development and realisation, and project evaluation
- a product or a system or an environment.

Students may commence work on the major design project from the beginning of the HSC course. Students will be required to submit to the Board of Studies an outline of the project on a date to be notified in Term 1 of the calendar year in which they complete the HSC course. A form for this purpose will be provided by the Board.

The Major Design Project will be completed and submitted on a date to be notified annually by the Board. Items included as part of the Major Design Project must be clearly labelled with the candidate number, centre number and title. On the day of submission for marking, schools will be required to complete a certificate signed by the principal to verify that all work submitted is the student's own work, completed under the supervision and guidance of the teacher. A form for this purpose will be provided by the Board.

In some circumstances it may be necessary for some aspect of the project to be undertaken by some other person or agency. In such cases, the contribution of the outside agent/organisation must be documented in the design folio. Students will not be given credit for actual work completed by others. Justification for, and of, such work will be recognised in the marking process.

The Major Design Project will be marked by examiners appointed by the Board. A brief written record of each student's progress throughout the project must be kept by the teacher. This should not be submitted with the project, but may be requested in exceptional circumstances where the examiners require further information. This record should be retained in the school together with assessment records.

Component: Project Proposal and Project Management (15 marks)

This section requires candidates to provide detail in their folio about the intended direction of their Major Design Project (MDP) and how they plan to proceed with and manage the project to completion. This section should provide a constant reference point as students progress through the Project Development and Realisation, and Evaluation.

Assessment criteria

- Identification and exploration of the need
- Areas of investigation
- Criteria to evaluate success
- Action, time and finance plans and their application
- Selection and use of ideas and resources

Outcomes assessed: H1.2, H4.1, H4.2, H5.1, H5.2

MARKING GUIDELINES

Criteria	Marks
<ul style="list-style-type: none"> • Identifies and provides a detailed exploration of genuine needs and opportunities, justifying final selection for the development of the MDP • Describes relevant areas of investigation which relate clearly to the need and provide direction for further action • Establishes and analyses appropriate criteria to evaluate the success of the MDP • Formulates and evaluates well-documented action, time and finance plans with clear evidence of their application in the MDP • Identifies and justifies the selection of resources based on the results and analysis of research 	13 – 15
<ul style="list-style-type: none"> • Identifies and provides an exploration of needs and opportunities, in relation to the development of the MDP • Describes some relevant areas of investigation in relation to the need • Describes appropriate criteria to evaluate the success of the MDP, with little analysis of these criteria • Formulates action, time and finance plans, and shows some evidence of their application in the MDP • Identifies the selection of resources based on the results and analysis of research, with limited justification <p>Candidates may achieve 10 – 12 marks as indicated above OR by satisfying a combination of the criteria for other mark ranges.</p>	10 – 12
<ul style="list-style-type: none"> • States a need, with limited exploration in relation to the development of the MDP • Lists one or two areas of investigation in relation to the need, which may not relate to further action • Briefly describes criteria to evaluate the success of the MDP, with no analysis of these criteria • Formulates and applies action and/or time and/or finance plans • Identifies the selection of resources, with inadequate justification <p>Candidates may achieve 7 – 9 marks as indicated above OR by satisfying a combination of the criteria for other mark ranges.</p>	7 – 9

Criteria	Marks
<ul style="list-style-type: none"> • States a need, with no exploration in relation to the development of the MDP • Names an area of investigation in relation to the need which may not relate to further action • Briefly describes criteria, some of which may be inappropriate to evaluate the success of the MDP • Some evidence of action/time or finance planning • Lists resources with little explanation or justification <p>Candidates may achieve 4 – 6 marks as indicated above OR by satisfying a combination of the criteria for other mark ranges.</p>	4 – 6
<ul style="list-style-type: none"> • Does not clearly state the need, or explore the need in relation to the development of the MDP • Names an area of investigation • Lists mainly inappropriate criteria to evaluate the success of the MDP • Action/time or finance planning not evident • Lists resources with no explanation or justification <p>Candidates may achieve 1 – 3 marks as indicated above OR by satisfying a subset of the criteria for other mark ranges.</p>	1 – 3

Component: Project Development and Realisation (35 marks)

In this section, the development and realisation of the Major Design Project (both the folio and product, system or environment) is clearly evidenced, documented and explained.

Assessment criteria

- Evidence of creativity – ideas generation, degree of difference and exploration of existing ideas
- Consideration of design factors relevant to the Major Design Project (as defined in the Design and Technology Stage 6 syllabus, page 18)

- Documentation of research, experimentation and testing of:
 - design ideas
 - materials
 - tools
 - techniques
- Application of conclusions
- Identification and justification of ideas and resources
- Evidence of the testing of design solutions and application of conclusions
- Use of communication and presentation techniques
- Evidence and application of practical skills to produce a quality project
- Consideration of the practices in industrial/commercial settings as they relate to the Major Design Project

Outcomes assessed: H1.2, H2.1, H3.2, H4.2, H5.1, H5.2, H6.1

MARKING GUIDELINES

Criteria	Marks
<ul style="list-style-type: none"> • Demonstrates the application of creativity in the development of the MDP • Critically analyses a wide range of design factors relevant to the MDP • Distinguishes between, and applies, the most appropriate research methods in the development of the MDP • Evaluates the results of experimentation and testing and applies this to the MDP • Applies conclusions developed from research to the MDP • Justifies the selection and use of resources in the idea development for the MDP • Synthesises design solution testing and applies conclusions to the development of the MDP • Demonstrates a range of appropriate communication and presentation techniques • Applies a range of high-quality practical skills in the development of the MDP • Analyses the relationship between practices adopted in the MDP and those in industrial/commercial settings. 	29 – 35

Criteria	Marks
<ul style="list-style-type: none"> • Demonstrates substantial application of creativity in the development of the MDP • Critically analyses a range of design factors relevant to the MDP • Distinguishes between, and applies appropriate research methods in the development of the MDP • Describes the results of experimentation and testing with some application of conclusions to the MDP • Explains the selection and use of resources in the idea development for the MDP • Describes design solution testing and applies some conclusions to the development of the MDP • Demonstrates some appropriate communication and presentation techniques • Applies a range of practical skills in the development of the MDP • Compares the relationship between practices adopted in the MDP and those in industrial/commercial settings <p>Candidates may achieve 22 – 28 marks as indicated above OR by satisfying a combination of the criteria for other mark ranges.</p>	<p>22 – 28</p>
<ul style="list-style-type: none"> • Demonstrates some creativity in the development of the MDP • Describes some design factors relevant to the MDP • Applies appropriate research methods in the development of the MDP • Describes the results of experimentation and testing with some application of the conclusions to the MDP • Describes the selection and use of resources in the idea development for the MDP • Describes design solution testing • Demonstrates some communication and presentation techniques, not all appropriate • Applies sound practical skills in the development of the MDP • Describes practices adopted in the MDP and those in industrial/commercial settings, with some comparisons drawn <p>Candidates may achieve 15 – 21 marks as indicated above OR by satisfying a combination of the criteria for other mark ranges.</p>	<p>15 – 21</p>

Criteria	Marks
<ul style="list-style-type: none"> • Provides some evidence of design factors, most of which are relevant to the MDP • Some evidence of appropriate research methods in the development of the MDP • Briefly describes the results of experimentation and testing without applying conclusions to the MDP • Describes some resources used for the MDP • Provides evidence of design solution testing • Demonstrates a limited range of communication and presentation techniques • Applies basic practical skills in the development of the MDP • Provides evidence of practices adopted in the MDP or those in industrial/commercial settings, without comparing or contrasting <p>Candidates may achieve 8 – 14 marks as indicated above OR by satisfying a combination of the criteria for other mark ranges.</p>	8 – 14
<ul style="list-style-type: none"> • Provides limited evidence of design factors, few of which are relevant to the MDP • Minimal evidence of research methods in the development of the MDP • Minimal description of the results of experimentation and testing, unrelated to the MDP • Lists few resources used for the MDP • Provides little evidence of design solution testing • Demonstrates minimal communication and presentation techniques • Applies minimal practical skills in the development of the MDP • Provides limited evidence of practices adopted in the MDP or those in industrial/commercial settings, without comparing or contrasting <p>Candidates may achieve 1 – 7 marks as indicated above OR by satisfying a subset of the criteria for other mark ranges.</p>	1 – 7

Component: Evaluation (10 marks)

In this section, candidates are required to provide evidence of continual evaluation throughout the development and realisation of the Major Design Project. This also includes linking back to the original criteria developed in the Project Proposal and Project Management section to evaluate the success of the project.

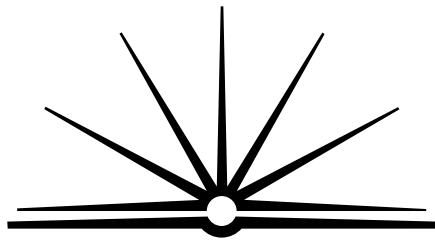
Assessment criteria

- Recording and application of evaluation procedures throughout the design project
- Analysis and evaluation of functional and aesthetic aspects of design
- Final evaluation with respect to the project proposal and the project’s impact on society and the environment
- Relationship of the final product, system or environment to the project proposal

Outcomes assessed: H1.2, H4.2, H4.3, H5.1

MARKING GUIDELINES

Criteria	Marks
<ul style="list-style-type: none"> • Critically evaluates all aspects of the MDP throughout its entire development • Analyses and critically evaluates the functional and aesthetic aspects of the MDP • Critically evaluates the impact of the MDP on society and the environment • Analyses the relationship of the MDP to the criteria for success identified in the project proposal 	9 – 10
<ul style="list-style-type: none"> • Critically evaluates most aspects of the MDP throughout its entire development • Explains the functional and aesthetic aspects of the MDP • Explains the impact of the MDP on society and the environment • Compares the relationship of the MDP to the criteria for success identified in the project proposals <p>Candidates may achieve 7 – 8 marks as indicated above OR by satisfying a combination of the criteria for other mark ranges.</p>	7 – 8
<ul style="list-style-type: none"> • Judges the success of some aspects of the MDP through stages of its development • Describes some functional and/or aesthetic aspects of the MDP • Describes the impact of the MDP on society and/or the environment • Checks the MDP against the criteria for success identified in the project proposals, with little or no explanation <p>Candidates may achieve 5 – 6 marks as indicated above OR by satisfying a combination of the criteria for other mark ranges.</p>	5 – 6
<ul style="list-style-type: none"> • Describes, with little justification, the success of several aspects of the MDP • Describes a functional and/or aesthetic aspect of the MDP • Briefly or inaccurately describes the impact of the MDP on society and/or the environment • Checks the MDP against some of the criteria for success identified in the project proposals, without explanation <p>Candidates may achieve 3 – 4 marks as indicated above OR by satisfying a combination of the criteria for other mark ranges.</p>	3 – 4
<ul style="list-style-type: none"> • Describes, without justification, the success of an aspect of the MDP • Names a functional or aesthetic aspect of the MDP • No description of the impact of the MDP on society or the environment • Does not clearly related the MDP to the criteria for success identified in the project proposals <p>Candidates may achieve 1 – 2 marks as indicated above OR by satisfying a subset of the criteria for other mark ranges.</p>	1 – 2



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

2001
HIGHER SCHOOL CERTIFICATE
SPECIMEN EXAMINATION

Design and Technology

General Instructions

- Reading time – 5 minutes
- Working time – $1\frac{1}{2}$ hours
- Write using blue or black pen
- Write your Centre Number and Student Number at the top of page 7

Section I Pages 2 – 5

Total marks **(10)**

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

Section II Pages 7 – 9

Total marks **(15)**

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

Section III Page 11

Total marks **(15)**

- Attempt ONE question from Questions 12 – 14
- Allow about 40 minutes for this section

Section I

Total marks (10)

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 this by writing the word *correct* and drawing an arrow as follows:

A B ^{*correct*} C D

- 1** A local council is considering the establishment of a new youth centre. Which processes would be most important in the initial stages of the project development?
- (A) Investigating sponsorship opportunities and drafting a finance plan
 - (B) Researching and analysing community needs
 - (C) Conducting and publishing an environmental impact study
 - (D) Constructing and displaying a model of the proposed building for evaluation
- 2** Why might a designer patent a design?
- (A) To protect the designer's intellectual property
 - (B) To meet recognised industry standards
 - (C) To ensure that the design is successful
 - (D) To encourage overseas investment in the development of the design
- 3** A person is establishing a business that restores and sells second-hand goods. What would be the most appropriate first step in planning the venture?
- (A) Developing a financial plan
 - (B) Identifying subcontractors to undertake restoration work
 - (C) Locating a suitable high-exposure outlet
 - (D) Researching to determine the market for second-hand goods
- 4** Which of the following contribute to the costs of marketing a product?
- (A) Advertising, manufacturing, packaging
 - (B) Advertising, market research, packaging
 - (C) Advertising, manufacturing, market research
 - (D) Manufacturing, market research, packaging
- 5** The trend towards design for disassembly means that more products are made so that they can be taken apart, reused, and/or recycled. This trend is primarily the result of
- (A) changing manufacturing processes in moulded components.
 - (B) consumer demand for cheaper components.
 - (C) concerns about dwindling resources.
 - (D) changing trends in design aesthetics.

- 6 What is meant by the term *sustainable technology*?
- (A) Technology that leads to increased production without using more natural resources
 - (B) Technology that meets production requirements while using no natural resources
 - (C) Technology that meets production requirements while conserving natural resources
 - (D) Technology that allows for continuous production and uses more natural resources
- 7 A designer has been commissioned to design a new dispensing system for liquid soap. In order to evaluate this system, which action would be most appropriate?
- (A) Conduct a portion control analysis.
 - (B) Produce a set of working drawings.
 - (C) Invite a focus group to evaluate the concept.
 - (D) Make a working prototype and test the system.
- 8 Current industrial design can be a collaborative process. What is the prime responsibility of the manager of a collaborative design team?
- (A) Developing and monitoring time/action plans
 - (B) Negotiating finance to facilitate production
 - (C) Generating initial concept sketches
 - (D) Conducting market research
- 9 Many products are designed for mass production. During the manufacturing stage, which of the following processes is the most appropriate to ensure a quality product?
- (A) Use of new and innovative technologies
 - (B) Random sampling and testing procedures
 - (C) Continual evaluation and design modification
 - (D) Regular maintainance and upgrading of equipment

- 10** 'Built-in obsolescence' is a feature of product design that
- (A) maintains the long-term profitability of manufacturing firms.
 - (B) ensures that products adhere to current trends.
 - (C) encourages the development of new technologies.
 - (D) limits the product's useful working life.

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Centre Number

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Student Number

Section II

Total marks (15)

Attempt Question 11

Allow about 35 minutes for this section

Answer the question in the spaces provided.

	Marks
Question 11 (15 marks)	
(a) Why is the concept of intellectual property important to designers?	1
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.....	
(b) Aesthetic factors affect design. Define <i>aesthetic</i> and give ONE example of how aesthetic factors have influenced a design you have studied or created.	3
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Question 11 continues on page 8

Question 11 (continued)

- (c) The Second World War dramatically changed the pattern of industrial innovation in Australia. For example, the Owen sub-machine gun was designed and produced in Australia specifically to meet the needs of the Australian Army. 2

Identify ONE other historical event or period, and briefly describe how it influenced design and production.

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(d)

**OLD TYRES TRANSFORMED
INTO NEW PRODUCTS**

Non-slip mats for household entrances, bathrooms, car floors, showers and bowling greens – these are just some of the endless uses for *MasterFibre* – the new matting made from old shredded car tyres, thanks to the development of a new bonding process. Other products include: commercial safety matting for shops, swimming pool surrounds, playground matting and animal floats. *MasterFibre* is waterproof, non-toxic, does not rot and can be hosed clean – and most importantly uses waste material that is very hard to get rid of.

- (i) Why is *MasterFibre* an innovation? 1

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Question 11 continues on page 9

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Section III

Total marks (15)

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)	
‘Best practice in design can only exist if it focuses on people and builds in health and safety considerations.’	
(a) Explain how health and safety considerations have been addressed in a design you have studied.	5
(b) Discuss the importance of designers addressing health and safety considerations in their designs.	10

OR

Question 13 (15 marks)

A company is investigating the development of a new hand-held electronic game for 8 to 12 year olds.

(a) Describe in detail TWO functional criteria that would need to be considered in the development of the hand-held unit.	5
(b) Discuss TWO ethical considerations that may influence the development and marketing of the game.	10

OR

Question 14 (15 marks)

‘New and emerging technologies in fields such as communication, genetic engineering and manufacturing impact significantly on society.’

(a) Discuss the impact on the individual and society of an emerging technology that you have studied.	5
(b) Discuss the legal implications of new and emerging technologies.	10

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