

2001 HSC Notes from  
the Examination Centre  
Design and Technology

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# 2001 HSC NOTES FROM THE EXAMINATION CENTRE DESIGN AND TECHNOLOGY

## Introduction

This document has been produced for the teachers and candidates of the Stage 6 course in Design and Technology. It provides comments with regard to responses to the 2001 Higher School Certificate Examination, indicating the quality of candidate responses, and highlighting the relative strengths and weaknesses of the candidature in each section and each question.

It is essential for this document to be read in conjunction with the relevant syllabus, the 2001 Higher School Certificate Examination, the Marking Guidelines, and other support documents, which have been developed by the Board of Studies to assist in the teaching and learning of Design and Technology.

With regard to the Major Design Project (MDP), this includes: Project Proposal and Project Management; Project Development and Realisation; and Project Evaluation.

## Major Design Project

Candidates involved themselves in a broad range of design challenges.

### Component - Project Proposal and Project Management

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

The development of the subject for the new HSC and the inclusion of the Project Proposal into this component as well as allocating more marks to this component than was previously the case, provided opportunity for candidates to research the real needs that they would endeavour to meet.

### Assessment criteria

#### Identification and exploration of the need

Most candidates identified a need, but the exploration of that need was carried out by only outstanding candidates, many of whom carried out action research, critical analysis of collected data and other preliminary investigation prior to the final statement of a project proposal.

#### Areas of investigation

Generally presented by candidates as a list of aspects to be covered rather than a list of fields of investigation with subsets of specifics. Candidates should analyse the needs they are trying to meet and develop a list of the fields of investigation and use a lateral thinking technique (mind mapping or brain storming) to develop the specific locations for that investigation.

#### Criteria to evaluate success

Candidates responded well to this concept by considering the project proposal and the needs that the product, system or environment should meet, and in many cases creating an assessment tool for

the specific criteria stated. Single word criteria do not assist the candidate in their ongoing evaluation of the project's development. Words such as good, pretty, strong should be defined in context so that reference can be made to these definitions later in the product development.

### **Action, time and finance plans and their application**

The area of greatest concern during the marking was the apparently retrospective style of the action, time and finance plans. The planning of the management of the whole project is essential to a candidate achieving success with the whole Major Design Project.

Aspects of development and realisation, investigation and experimentation, prototype development, production, implementation and evaluation should be built into the process of planning. Candidates should be advised that it is appropriate to develop a plan of action and edit this document during the project development to show new directions that may arise. It is essential however that the original documentation, written at the commencement of the project, remains.

### **Selection and use of ideas and resources**

Some confusion was evident in candidates' responses.

In this Project Proposal and Project Management section of the MDP, students are required to *identify and justify the selection of resources based on the results and analysis of research*. This means that candidates need to research where they might locate appropriate sources of information for their project and for further research. Candidates are confusing this section with the following section – Project Development and Realisation – where candidates are required to *justify the selection and use of resources* (eg materials and equipment etc) *in the idea development of the MDP*. In this section, candidates will use appropriate resources for their MDP and then justify why they were appropriate.

Candidates must recognise the difference between the two sections and corresponding Marking Guidelines to ensure that they achieve maximum marks.

### **Component - Project Development and Realisation**

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

### **Assessment criteria**

#### **Evidence of creativity – ideas generation, degree of difference and exploration of existing ideas**

This aspect of design and technology was well understood by candidates. Many indicated a thorough understanding of a definition of innovation versus invention. Recognising that a degree of difference in the ideas, technology use and/or final product, system or environment was an acceptable indicator of these outcomes.

#### **Consideration of design factors relevant to the Major Design Project (as defined in the *Design and Technology Stage 6 Syllabus*, p 18)**

Though explicitly listed in the syllabus, many candidates could not relate these factors directly to their project. Some candidates were able to relate these factors from the syllabus and add more.

### **Documentation of research, experimentation and testing of design ideas, materials, tools and techniques**

The importance of valid experimentation and testing needs to be evidenced in the development of the product, system or environment. Many candidates documented 'research, experimentation and testing' for the sake of documenting it rather than it being used as a tool to improve the development of the product as part of the designing process.

### **Application of conclusions**

Overall, candidates could improve the amount of experimentation and testing of design ideas, materials, tools and techniques. The development of a Major Design Project will involve a long period of practical activity to improve the product system or environment. Those candidates who carried out a simple development process did very well in providing evidence of their application of conclusions to their product, system or environment.

### **Identification and justification of ideas and resources**

Most candidates managed to identify the ideas and resources that they used in the development of their Major Design Project. This was an area of strength. The justification of the selection of the ideas and resources used was a concept less well understood. This should be linked to the criteria to evaluate success from the project proposal.

### **Evidence of the testing of design solutions and application of conclusions**

During the development stage of Major Design Projects, many candidates failed to implement a process of model or mock-up development. Processes of development such as this enable candidates to demonstrate both the testing of solutions to design challenges they meet as they progress and the testing of the whole concept.

### **Use of communication and presentation techniques**

A broad range of technologies were used in the presentation of all aspects of product, systems and environment development. From the written word to multimedia presentations, excellent use of the Internet for research and communication person to person, candidates showed a growth in the range of techniques they can use appropriately.

### **Evidence and application of practical skills to produce a quality project**

Successful candidates in Design and Technology continue to produce work at the highest technical levels. This was evident in many products, systems and environments and in a growing range of technologies. The quality of the Major Design Project continues to be an essential component of success in Design and Technology.

### **Consideration of the practices in industrial/commercial settings as they relate to the Major Design Project**

Although clearly discussed by many teachers, this section of the Major Design Project was not well executed by candidates; many focused on the implementation or manufacturing side of the product only. They did not discuss the process that would be used in the design development of similar products in an industrial and/or commercial setting. Some candidates included marketing aspects that could be considered in commercial settings and were credited accordingly.

## **Component - Evaluation**

In this section, candidates were required to provide evidence of continual evaluation throughout the development and realisation of the Major Design Project. This also included 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**

As with other parts of the marking guidelines, many candidates used this as a heading for a section of their portfolio. This is unnecessary. The better response is to record, as the project progresses, evaluative comments and procedures as they occur.

The sample marking guidelines for the Major Design Project are not a series of headings, nor a design process to follow. They contain the criteria used to assess candidate outcomes shown when they apply a process of designing through problem identification, exploration, development, realisation and evaluation. This process will lead candidates to evaluate, reflect and respond by applying the results of evaluation to the development of the product, system or environment.

#### **Analysis and evaluation of functional and aesthetic aspects of design**

Candidates were well able to add an evaluation of function and of aesthetics. Often this seemed to be carried out as an afterthought, rather than something that will inform the areas to be investigated and the criteria to evaluate success.

#### **Final evaluation with respect to the project proposal and the project's impact on society and the environment**

Societal impact still proves to be an area of evaluation that is difficult for many candidates. Some work in the case study about societal impacts of designs and design and production may assist candidates in this area. Environmental issues are better addressed but rarely extend to Life Cycle Assessments of materials or of environmental impact of processes used. A number of candidates failed to relate the criteria to evaluate success from the Project Proposal to the final evaluation of the MDP.

#### **Relationship of the final product, system or environment to the project proposal**

This aspect was well done by most candidates.



## Written Examination

### Section I – Multiple Choice

Question	Correct Response
1	C
2	D
3	A
4	C
5	A

Question	Correct Response
6	B
7	D
8	B
9	C
10	D

### Section II

#### General Comments

This section was mandatory for all candidates and allowed them to demonstrate their knowledge and understanding of design factors, intellectual property, ethics and the environment.

Generally, candidates did not exhibit a sound understanding of the Glossary of Key Words and its application.

#### Specific Comments

##### Question 11

- (a) Overall, the majority of candidates were able to give two or more valid reasons why the given radio may be appropriate to poor rural communities in remote locations. Answers included: uses for solar power, no need for batteries, durable, portable and provides health information. More able candidates identified that the radio had a high purchase price and was advertised on the Internet as being inappropriate to poor rural communities.
- (b) This question required the candidates to discuss two of the nominated design factors that related to the Freeplay radio. Better candidates were able to do this by detailing a number of issues for each of the factors.

##### Cost

The majority of candidates were able to identify the purchase and/or running costs and relate these to the target market. Many candidates referred to the stimulus material in their responses and were able to receive full marks for this part.

##### Ergonomics

Good responses in this section were limited. Many candidates did not discuss how the ergonomic features, including the knobs, dial, handle, shape, size etc were appropriate for the identified users. This was the least well-answered part of the question.

### **Function**

This section was answered reasonably well. Most candidates were able to identify the functional factors of the radio. However, some candidates failed to identify more than one factor and relate the factors to the identified users. Many candidates used the stimulus material to guide their answer, making it easy for them to identify a number of factors. Some candidates confused the word 'wind': as in wind-up, for 'wind': as in wind power.

- (c) Very few candidates were able to achieve the full range of marks for this section due to inadequate critical analysis. These candidates indicated a lack of understanding of the term 'critical analysis'. Candidates tended to simply list a number of points with or without any relationship between these points. Candidates gave some excellent responses, but many were not able to give responses that indicated a depth of understanding of the issues, simply relying on detailing one or two issues only.
- (d) (i) The majority of candidates did not gain full marks in this section because they were unable to provide characteristics and features of more than one method of protecting intellectual property. Some candidates found it difficult to distinguish between various methods of protection, whereas other candidates were able to provide at least one method and the associated characteristics.
- (ii) Many candidates failed to identify a factor that impacted on the success of their chosen innovation and explain the relationship between the factor and the success. Candidates who were able to do this were awarded full marks for this question part.

## **Section III**

### **General Comments**

This section of the written paper provides the opportunity for candidates to select from three questions and answer one that may be of particular relevance to their study of design. In 2001, the questions covered outcomes relating to factors affecting designing, social and historical issues, researching and research methodologies, ethics, new and emerging technologies and innovation.

### **Specific Comments**

#### **Question 12**

The majority of candidates answered question 12.

- (a) Most candidates could easily list three features of the hand blender. Some candidates, however, experienced difficulty describing how the features of the hand blender reflected its function. Most could describe and relate two features to the function of the hand blender. The majority of candidates used the stimulus material provided very well. Some candidates described how the form of the hand blender reflected its function, eg shape/length of the drive shaft made it suitable for milk shakes etc.

- (b) Most candidates were able to describe two or more appropriate health and safety issues by providing characteristics and features of the issues as they related to the hand blender. Explanations on the whole were superficial, as candidates had difficulty explaining the health and safety issues that had to be considered by the designer. Less able candidates typically limited their response to referring to the blade and blade cover only. Others considered the safety of the hand blender (such as blade and electrical components) as well as the health and hygiene of the product (eg easy to clean). Better responses included an identification of the design features and how they related to both health and safety issues. These responses provided an in depth and concise explanation of each issue.
- (c) Many candidates did not give this part sufficient attention. Answers were often brief, repetitive and general in their examples of social changes and of new technologies. Most candidates opted to discuss how social change and new technologies had influenced the design of the hand blender.

Some candidates did not interpret the question correctly, using more than one product example in their answer. Candidates with poorer responses demonstrated little evidence of analysis. There was evidence of candidates being able to identify some components of social change and new technology, but most did not show evidence of the relationship between these changes and the associated design implications. Frequently, candidates did not relate social changes and new technologies to the design of the chosen product.

Better responses to part (c) described two or more social changes and two or more new technologies. Candidates linked these factors to how they influenced the development of the product, demonstrating a clear understanding of how the product was dependent on these factors.

Examples of social change included: changing work demands; family roles and increased pace of life; changing consumer expectations; aesthetic expectations; inbuilt obsolescence and other lifestyle changes.

Examples of new technologies included: miniaturisation of components; smaller circuitry; better quality and production of machine parts resulting in smaller motors; and new materials such as plastics and stainless steel.

Candidates who provided high-quality responses analysed the effects of many of the above changes and developments, linking these to the features of the product that they had chosen.

### **Question 13**

A smaller proportion of candidates answered this question.

- (a) This part was generally well-answered by the majority of the candidates who attempted this question, who were able to provide characteristics and features of a research method. Candidates avoided naming the specific method and tended not to use subject-specific terminology, such as qualitative and quantitative research, and did not give a detailed description of an appropriate research method. The knowledge of prototypes, models, trialling etc used as tools in market research is well understood by candidates.

- (b) The majority of candidates effectively used graphical rather than written descriptions. Most commonly, responses centred on the individual response sheet for collecting data or a summary of collected data. Both interpretations were acceptable. Clear explanation and justification of selected format were not always provided by candidates and linked satisfactorily to part (a). Better candidates went further to indicate how the results could be quickly interpreted from the recording system presented. Some candidates failed to focus the research methodology on one area of investigation, but referred to the areas that needed to be investigated from the question.
- (c) Better candidates were able to discuss a range of examples and effectively relate them to better analyse ethical considerations when collecting, storing and using market research data. Ethics, as a concept, also seemed to not be well understood by candidates. They were able to discuss evidence or implications of ethical practice or unethical practice but did not articulate a deeper appreciation of the place of ethics in designing.

Most candidates could, however, discuss ethical considerations when collecting data, but did not expand this to the use and storage of that data. Candidates had no difficulty in discussing the issues but could not, generally, analyse them.

#### **Question 14**

A smaller proportion of candidates answered this question.

The questions began by stating ‘communication’ and the nature of the ‘information age’ are rapidly changing.’ Many candidates interpreted this question as a question based on the Internet and restricted themselves by trying to use the Internet as their emerging technology.

- (a) Better candidates were able to identify a new and emerging technology and give a clear and concise description of two or more features that distinguished it from existing or emerged technologies.

Other candidates were able to either identify a new or emerging technology and describe clearly one feature that distinguished it from existing technologies or identified a new and emerging technology and listed two additional features without giving any description.

Many candidates lacked a clear understanding of the difference between new and emerging technologies and emerged technologies in current or common use.

- (b) Better candidates were able to describe at least two relevant social and two economic impacts of emerging technology. They also clearly showed how these could/would result from the adoption of the new technology. They were able to make the relationships between the cause (new technology) and effect (social/economic impacts) clear.

Some candidates were able to briefly describe likely social and/or economic impacts of emerging technologies but did not link these to the adoption of the new technology. Some candidates continued to describe the new technology instead of explaining the social and economic impacts of it.

- (c) Better candidates were able to identify several key factors to be addressed before the new technology was widely adopted rather than just marketing strategies. They could consider the implications of these factors in terms of promoting or inhibiting the adoption of the technology. They showed an awareness of how the factors may inter relate and were able to use several relevant examples.

Many candidates used a flowchart to structure their response and subsequently extrapolate the process of adoption of the new technology.

Some candidates were able to identify several key factors to be addressed before the new technology could be adopted. They were able to show an awareness of how these factors relate to each other and to the adoption of the technology and were able to use some relevant examples.

Many candidates only referred to marketing and ignored any other factors e.g. investment, timing, political climate, legal framework, safety, environmental impact and entrepreneurial activity.

# 2001 Design and Technology

## HSC Examination Mapping Grid

Question	Marks	Content	Syllabus outcomes
1	1	Collaborative designing	H6.1
2	1	Factors affecting design	H1.1
3	1	Factors affecting design: sustainability	H1.1
4	1	Factors influencing innovation	H3.1
5	1	Factors affecting design	H1.1
6	1	Work of designers	H1.2
7	1	Trends in society	H2.1
8	1	Communication techniques	H5.2
9	1	Ethics and environment	H1.1, H2.2
10	1	Emerging technologies	H6.2
11(a)	2	Factors affecting design	H1.1, H3.1
11(b)	4	Factors affecting design	H1.1, H3.1
11(c)	5	Ethical issues	H2.2
11(d)(i)	2	Protection of intellectual property	H2.2
11(d)(ii)	2	Factors impacting on success of an innovation	H3.1
12(a)	3	Factors affecting design: function	H1.1
12(b)	4	Factors affecting design: safety	H1.1
12(c)	8	Trends in society: historical and cultural influences, social change, technological change	H2.1
13(a)	3	Research methods	H5.2
13(b)	4	Research methods: data collection and recording	H5.2
13(c)	8	Ethical issues	H2.2
14(a)	3	Emerging technologies	H6.2
14(b)	4	Emerging technologies: social and economic impact	H6.2
14(c)	8	Emerging technologies: factors influencing innovation and success of innovation	H2.2, H3.1, H6.2

<b>Major Design Project</b>			
<b>Component</b>	<b>Marks</b>	<b>Criteria</b>	<b>Syllabus outcomes</b>
Project proposal and project management	15	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	H1.2, H4.1, H4.2, H5.1, H5.2
Project development and realisation	35	Evidence of creativity – ideas generation, degree of difference and exploration of existing ideas Consideration of design factors relevant to the Major Design Project Documentation of research, experimentation and testing of <ul style="list-style-type: none"> <li>– design ideas</li> <li>– materials</li> <li>– tools</li> <li>– techniques</li> </ul> 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	H1.2, H2.1, H3.2, H4.2, H5.1, H5.2, H6.1
Evaluation	10	Record and application of evaluation procedures throughout the design project Analysis and evaluation of functional and aesthetic aspects of design Final evaluation with respect to project proposal and the project's impact on society and the environment Relationship of the final product, system or environment to the project proposal	H1.2, H4.2, H4.3, H5.1



## **2001 HSC Design and Technology Marking Guidelines**



**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.

**Written Paper — Design and Technology****Question 11 (a) (2 marks)**

*Outcomes assessed: H1.1, H3.1*

**MARKING GUIDELINES**

Criteria	Marks
• Gives two or more valid reasons why the radio is appropriate for poor rural communities in remote locations	2
• Gives one valid reason why the radio is appropriate for poor rural communities in remote locations	1

**Question 11 (b) (4 marks)**

*Outcomes assessed: H1.1, H3.1*

Students need to discuss TWO of the following:

**MARKING GUIDELINES**

Criteria	Marks
<b>COST</b>	2
• Discusses through identifying attributes of costs (purchase price and/or running costs) as they relate to the target market(s) (one cost)	
• Identifies and describes the cost of the radio or its running costs	1

**MARKING GUIDELINES**

Criteria	Marks
<b>ERGONOMICS</b>	2
• Discusses through identifying at least two factors that may include handle, knobs and dial which are appropriate for the identified users	
• Identifies and describes at least two factors that may include handles, knobs and dial	1

### MARKING GUIDELINES

Criteria	Marks
<b>FUNCTION</b> <ul style="list-style-type: none"> <li>Discusses through identifying the key attributes of function with reference to at least two examples that may include material, knobs, wind-up mechanism and handle for portability and relates these to the identified users</li> </ul>	2
<ul style="list-style-type: none"> <li>Describes key attributes of function with reference to at least two examples that may include material, knobs, wind-up mechanism and handle for portability</li> </ul>	1

**Question 11 (c)** (5 marks)

*Outcome assessed: H2.2*

### MARKING GUIDELINES

Criteria	Marks
<ul style="list-style-type: none"> <li>Identifies several (at least four) ethical and environmental issues relating to the Freeplay radio and the relationship between them with a high level of depth of understanding through points for and against these issues</li> </ul>	5
<ul style="list-style-type: none"> <li>Well justified description of several (at least four) appropriate ethical and environmental key issues relevant to the Freeplay radio</li> </ul>	4
<ul style="list-style-type: none"> <li>Identifies several (at least three) appropriate issues and provides some description of one or more of the issues</li> </ul>	3
<ul style="list-style-type: none"> <li>Outlines one appropriate issue and links it to the Freeplay radio</li> </ul>	2
<b>OR</b> <ul style="list-style-type: none"> <li>Outlines briefly two appropriate issues</li> </ul>	
<ul style="list-style-type: none"> <li>Outlines briefly one appropriate issue</li> </ul>	1

**Question 11 (d) (i)** (2 marks)

*Outcome assessed: H2.2*

### MARKING GUIDELINES

Criteria	Marks
<ul style="list-style-type: none"> <li>Provides characteristics and features of more than one method of protecting intellectual property</li> </ul>	2
<ul style="list-style-type: none"> <li>Lists two or more methods of protecting intellectual property</li> </ul>	1
<b>OR</b> <ul style="list-style-type: none"> <li>Provides characteristics and features of one method of protecting intellectual property</li> </ul>	

**Question 11 (d) (ii) (2 marks)***Outcome assessed: H3.1***MARKING GUIDELINES**

<b>Criteria</b>	<b>Marks</b>
• Describes an appropriate factor and a relevant example of an innovative product and explains the relationship between the factor and the product	2
• Describes one appropriate factor with a relevant example of an innovative product	1

## Section III

### Question 12 (a) (3 marks)

*Outcome assessed: H1.1*

#### MARKING GUIDELINES

Criteria	Marks
<ul style="list-style-type: none"><li>Lists three features and describes how each reflects its function</li></ul>	3
<ul style="list-style-type: none"><li>Lists two or three features and describes how two of them reflect their functions</li></ul>	2
<ul style="list-style-type: none"><li>Lists three features of the blender</li></ul> OR <ul style="list-style-type: none"><li>Gives one feature and provides characteristics of this feature that reflect its function</li></ul>	1

### Question 12 (b) (4 marks)

*Outcome assessed: H1.1*

#### MARKING GUIDELINES

Criteria	Marks
<ul style="list-style-type: none"><li>Describes two or more appropriate health and safety issues and provides a concise and in-depth explanation of each issue</li></ul>	4
<ul style="list-style-type: none"><li>Describes two or more appropriate health and safety issues and provides a brief explanation of each</li></ul>	3
<ul style="list-style-type: none"><li>Good description of two health and safety issues without explanation</li></ul> OR <ul style="list-style-type: none"><li>A good explanation of one issue</li></ul>	2
<ul style="list-style-type: none"><li>Lists two health and safety issues</li></ul>	1

**Question 12 (c)** (8 marks)*Outcome assessed: H2.1***MARKING GUIDELINES**

<b>Criteria</b>	<b>Marks</b>
<ul style="list-style-type: none"><li>Analyses the way in which a range of social changes and new technologies have influenced the design of the product by clearly relating them to a product (examples of design features of the product) (Note – Candidates who only refer to either social changes or new technologies 3 – 4 marks)</li></ul>	6–8
<ul style="list-style-type: none"><li>Describes a number of social factors and technological factors and clearly relates them to how they have influenced a product (examples) (Note – Candidates who only refer to either social changes or new technologies 2 – 3 marks)</li></ul>	4–5
<ul style="list-style-type: none"><li>Describes more than one social and more than one technological factor that have influenced a product (Note – Candidates who only refer to either social changes or new technologies 1 – 2 marks)</li></ul>	2–3
<ul style="list-style-type: none"><li>Brief description of one social OR one technological factor that has influenced a product</li></ul>	1

Note: Candidates must refer to the same product throughout the answer.

**Question 13 (a)** (3 marks)*Outcome assessed: H5.2***MARKING GUIDELINES**

<b>Criteria</b>	<b>Marks</b>
<ul style="list-style-type: none"><li>A detailed description of an appropriate research method for collecting data on consumer preferences</li></ul>	3
<ul style="list-style-type: none"><li>Brief description of an appropriate research method</li></ul>	2
<ul style="list-style-type: none"><li>Identifies an appropriate research method</li></ul>	1

**Question 13 (b) (4 marks)**

*Outcome assessed: H5.2*

**MARKING GUIDELINES**

Criteria	Marks
<ul style="list-style-type: none"> <li>• Draws up an appropriate recording system using categories</li> <li>• Explains the appropriateness of the recording system with references to such things as: easy to read, all likely data</li> <li>• Clear explanation of why it is consistent with the research method and consumer preferences</li> </ul>	4
<ul style="list-style-type: none"> <li>• Draws up a recording system, with relevant categories linked appropriately to the research method and consumer preferences</li> </ul>	3
<ul style="list-style-type: none"> <li>• Draws up a recording system using some appropriate categories</li> </ul>	2
<ul style="list-style-type: none"> <li>• Names one appropriate method of recording data with a brief description OR simplistic attempt at drawing a system</li> </ul>	1

Notes:

- 1 The recording system may refer to the collection of data at initial contact point (eg the survey form) or the recording of all data collected (eg tally sheet to record responses from a number of respondents).
- 2 Answers to (a) and (b) must refer to some research method.

**Question 13 (c) (8 marks)**

*Outcome assessed: H2.2*

**MARKING GUIDELINES**

Criteria	Marks
<ul style="list-style-type: none"> <li>• Analyses by identifying implications and knowledge of the ethical considerations related to collecting, storing and using research data, citing a range of related examples</li> </ul>	6–8
<ul style="list-style-type: none"> <li>• Describes in detail ethical considerations related to collecting, storing and using research data, citing examples</li> </ul>	4–5
<ul style="list-style-type: none"> <li>• Describes at least two ethical issues related to research</li> </ul>	2–3
<ul style="list-style-type: none"> <li>• Outlines a consideration related to the ethics of research</li> </ul>	1

**Question 14 (a) (3 marks)**
*Outcome assessed: H6.2*
**MARKING GUIDELINES**

Criteria	Marks
<ul style="list-style-type: none"> <li>Identifies a new or emerging technology (one that is yet to be widely accepted by the user community), with descriptions of two features which distinguish it from existing (emerged) technology</li> </ul>	3
<ul style="list-style-type: none"> <li>Identifies a new or emerging technology (one that is yet to be widely accepted by the user community), and describes one additional feature</li> </ul> OR <ul style="list-style-type: none"> <li>Identifies a new or emerging technology (one that is yet to be widely accepted by the user community), and lists two additional features (without description)</li> </ul>	2
<ul style="list-style-type: none"> <li>Identifies a new or emerging technology (one that is yet to be widely accepted by the community)</li> </ul>	1

**Question 14 (b) (4 marks)**
*Outcome assessed: H6.2*
**MARKING GUIDELINES**

Criteria	Marks
<ul style="list-style-type: none"> <li>Describes, using relevant examples, at least two social and two economic impacts of the emerging technology, and clearly shows how these could result from adoption of the new technology (show cause and effect)</li> </ul>	4
<ul style="list-style-type: none"> <li>Describes the likely social/or economic impacts of the emerging technology in 14 (a) (one social and two economic OR two social and one economic) with some links shown to the adoption of the new technology</li> </ul>	3
<ul style="list-style-type: none"> <li>Describes the likely social/or economic impacts of the emerging technology in 14 (a)</li> </ul>	2
<ul style="list-style-type: none"> <li>Lists without description two social and/or economic impacts directly related to 14 (b)</li> </ul>	1

**Question 14 (c)** (8 marks)*Outcomes assessed: H2.2, H3.1, H6.2***MARKING GUIDELINES**

<b>Criteria</b>	<b>Marks</b>
<ul style="list-style-type: none"><li>• Identifies several key factors to be addressed before a new technology is widely adopted</li><li>• Considers the implications of these factors in terms of promoting or inhibiting the adoption of the technology</li><li>• Shows awareness of how these factors may interrelate</li><li>• Uses relevant examples appropriately</li></ul>	6–8
<ul style="list-style-type: none"><li>• Identifies several key factors to be addressed before a new technology is adopted</li><li>• Shows awareness of how the factors relate to each other and to adoption of the technology</li><li>• Uses some relevant examples</li></ul>	4–5
<ul style="list-style-type: none"><li>• Identifies and describes one or two key factors (uses an appropriate example)</li></ul>	2–3
<ul style="list-style-type: none"><li>• Identifies one or two factors (eg marketing, timing) which move the technology into the market place</li></ul>	1



## Major Design Project

### *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"> <li>• Identifies and provides a detailed exploration of genuine needs and opportunities, justifying final selection for the development of the MDP</li> <li>• Describes relevant areas of investigation which relate clearly to the need and provide direction for further action</li> <li>• Establishes and analyses appropriate criteria to evaluate the success of the MDP</li> <li>• Formulates and evaluates well-documented action, time and finance plans with clear evidence of their application in the MDP</li> <li>• Identifies and justifies the selection of resources based on the results and analysis of research</li> </ul>	13 – 15
<ul style="list-style-type: none"> <li>• Identifies and provides an exploration of needs and opportunities, in relation to the development of the MDP</li> <li>• Describes some relevant areas of investigation in relation to the need</li> <li>• Describes appropriate criteria to evaluate the success of the MDP, with little analysis of these criteria</li> <li>• Formulates action, time and finance plans, and shows some evidence of their application in the MDP</li> <li>• Identifies the selection of resources based on the results and analysis of research, with limited justification</li> </ul> <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

Criteria	Marks
<ul style="list-style-type: none"> <li>• States a need, with limited exploration in relation to the development of the MDP</li> <li>• Lists one or two areas of investigation in relation to the need, which may not relate to further action</li> <li>• Briefly describes criteria to evaluate the success of the MDP, with no analysis of these criteria</li> <li>• Formulates and applies action and/or time and/or finance plans</li> <li>• Identifies the selection of resources, with inadequate justification</li> </ul> <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
<ul style="list-style-type: none"> <li>• States a need, with no exploration in relation to the development of the MDP</li> <li>• Names an area of investigation in relation to the need which may not relate to further action</li> <li>• Briefly describes criteria, some of which may be inappropriate to evaluate the success of the MDP</li> <li>• Some evidence of action, time or finance planning</li> <li>• Lists resources with little explanation or justification</li> </ul> <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"> <li>• Does not clearly state the need, or explore the need in relation to the development of the MDP</li> <li>• Names an area of investigation</li> <li>• Lists mainly inappropriate criteria to evaluate the success of the MDP</li> <li>• Action, time or finance planning not evident</li> <li>• Lists resources with no explanation or justification</li> </ul> <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) are 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 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"> <li>• Demonstrates the application of creativity in the development of the MDP</li> <li>• Critically analyses a wide range of design factors relevant to the MDP</li> <li>• Distinguishes between, and applies, the most appropriate research methods in the development of the MDP</li> <li>• Evaluates the results of experimentation and testing and applies this to the MDP</li> <li>• Applies conclusions developed from research to the MDP</li> <li>• Justifies the selection and use of resources in the idea development for the MDP</li> <li>• Synthesises design solution testing and applies conclusions to the development of the MDP</li> <li>• Demonstrates a range of appropriate communication and presentation techniques</li> <li>• Applies a range of high-quality practical skills in the development of the MDP</li> <li>• Analyses the relationship between practices adopted in the MDP and those in industrial/commercial settings</li> </ul>	29 – 35

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

Criteria	Marks
<ul style="list-style-type: none"> <li>• Provides some evidence of design factors, most of which are relevant to the MDP</li> <li>• Some evidence of appropriate research methods in the development of the MDP</li> <li>• Briefly describes the results of experimentation and testing without applying conclusions to the MDP</li> <li>• Describes some resources used for the MDP</li> <li>• Provides evidence of design solution testing</li> <li>• Demonstrates a limited range of communication and presentation techniques</li> <li>• Applies basic practical skills in the development of the MDP</li> <li>• Provides evidence of practices adopted in the MDP or those in industrial/commercial settings, without comparing or contrasting</li> </ul> <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"> <li>• Provides limited evidence of design factors, few of which are relevant to the MDP</li> <li>• Minimal evidence of research methods in the development of the MDP</li> <li>• Minimal description of the results of experimentation and testing, unrelated to the MDP</li> <li>• Lists few resources used for the MDP</li> <li>• Provides little evidence of design solution testing</li> <li>• Demonstrates minimal communication and presentation techniques</li> <li>• Applies minimal practical skills in the development of the MDP</li> <li>• Provides limited evidence of practices adopted in the MDP or those in industrial/commercial settings, without comparing or contrasting</li> </ul> <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"> <li>• Critically evaluates all aspects of the MDP throughout its entire development</li> <li>• Analyses and critically evaluates the functional and aesthetic aspects of the MDP</li> <li>• Critically evaluates the impact of the MDP on society and the environment</li> <li>• Analyses the relationship of the MDP to the criteria for success identified in the project proposal</li> </ul>	9 – 10
<ul style="list-style-type: none"> <li>• Critically evaluates most aspects of the MDP throughout its entire development</li> <li>• Explains the functional and aesthetic aspects of the MDP</li> <li>• Explains the impact of the MDP on society and the environment</li> <li>• Compares the relationship of the MDP to the criteria for success identified in the project proposal</li> </ul> <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"> <li>• Judges the success of some aspects of the MDP through stages of its development</li> <li>• Describes some functional and/or aesthetic aspects of the MDP</li> <li>• Describes the impact of the MDP on society and/or the environment</li> <li>• Checks the MDP against the criteria for success identified in the project proposal, with little or no explanation</li> </ul> <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

Criteria	Marks
<ul style="list-style-type: none"> <li>• Describes, with little justification, the success of several aspects of the MDP</li> <li>• Describes a functional and/or aesthetic aspect of the MDP</li> <li>• Briefly or inaccurately describes the impact of the MDP on society and/or the environment</li> <li>• Checks the MDP against some of the criteria for success identified in the project proposal, without explanation</li> </ul> <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"> <li>• Describes, without justification, the success of an aspect of the MDP</li> <li>• Names a functional or aesthetic aspect of the MDP</li> <li>• No description of the impact of the MDP on society or the environment</li> <li>• Does not clearly relate the MDP to the criteria for success identified in the project proposal</li> </ul> <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