

BOARD OF STUDIES  
NEW SOUTH WALES

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# 1995 HSC

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EXAMINATION  
REPORT

## Design and Technology

**Includes:**

- Marking criteria
- Sample responses
- Examiners' comments

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# 1995 HIGHER SCHOOL CERTIFICATE EXAMINATION

## DESIGN AND TECHNOLOGY

### EXAMINATION REPORT

#### CANDIDATURE

**2/3 Unit (Common) – 5200**

**3 Unit (Additional) – 470**

#### NATURE OF COURSE

##### COURSE DESCRIPTION

##### SYLLABUS

2/3 Unit Design and Technology approved by the Board of Studies in 1992 for implementation in 1993 and initial examination in 1994. Amended in 1993 for the purpose of *Pathways*, and implemented in 1994 for initial examination in 1995.

The Design and Technology Syllabus includes a Preliminary 2/3 Unit (Common) Course, an HSC 2/3 Unit (Common) Course and a 3 Unit (Additional) Course.

The 2/3 Unit (Common) Courses involve a Related Study, a Comparative Case Study, Design Projects and a Major Design Project.

The 3 Unit (Additional) Course involves a Core and a Specialised Study.

##### AIMS

This syllabus focuses on the study of technology and its applications through design in domestic, community, industrial and commercial settings in rural and/or urban environments.

It provides opportunities for students to:

- becoming enterprising, creative and adaptable

AIMS (Cont'd)

- develop the ability to design in response to human needs and wants
- develop attitudes and skills which will empower them to initiate and respond to change
- develop confidence and competence in the management and use of materials, tools, and techniques
- develop thinking and practical skills, and apply theoretical concepts for the realisation of practical solutions
- develop an understanding of a range of technological activities and their applications in a variety of enterprises
- develop a critical awareness and appreciation of the impact of current and emerging design and technology on the quality of life
- develop environmental and social responsibility in design, the use of technology and resource management

COURSE CONTENT

**Preliminary 2/3 Unit (Common) Course**

The Preliminary 2/3 Unit (Common) Course includes the Related Study, the investigative component of the Comparative Case Study, Design Projects and a proposal for the Major Design Project.

*The Preliminary Course is considered to be assumed knowledge for the HSC Course.*

**HSC 2/3 Unit (Common) Course**

The **Related Study** is addressed in the HSC Course through the Comparative Case Study and the Major Design Project. It involves content acquired in various ways. It deals with designing and producing, using resources, management, communication, marketing, issues relating to organisations as well as social, environmental and other aspects of design and production. Learning experiences extend from school-based activities into the world beyond school.

## COURSE CONTENT

(Cont'd)

The **Comparative Case Study** is made up of two components. The first component involves an investigation of two organisations, and is carried out in the Preliminary Course. The second component involves the comparison of the two organisations, and is carried out in the HSC Course.

The **Major Design Project** is a Design Project which is submitted for the Higher School Certificate Examination. A proposal for a Major Design Project is developed in the Preliminary 2/3 Unit (Common) Course. The Major Design Project is completed in the HSC 2/3 Unit (Common) Course.

## LENGTH OF COURSE

120 (indicative) hours of school study.

## HSC EXAMINATION FORMAT

- One written paper of 1 1/2 hour's duration.
- The Major Design Project which includes the realisation of a product, a system or an environment and the documentation of all aspects of the development of the project.

## COURSE CONTENT

### 3 Unit (Additional) Course

The 3 Unit (Additional) Course includes a **Core** and a **Specialised Study**.

In the **Core** students will investigate design and technology through a critical analysis of:

- innovation in design and technology
- success of innovation in design and technology
- entrepreneurial activity in design and technology

In the **Specialised Study** students will extend the research and development of ONE aspect of the 2/3 Unit (Common) Course Major Design Project. It will result in the development of ONE of the following options:

- an innovative application
- a new or improved resource
- a manufacturing system
- a marketing strategy

The Specialised Study is submitted for the HSC Examination.

## LENGTH OF COURSE

As for the 2/3 Unit Course plus 60 (indicative) hours of school study.

## HSC EXAMINATION FORMAT

- One written paper of one hour's duration.
- A Specialised Study which documents the research and development of an aspect of the 2/3 Unit (Common) Major Design Project.

## **GUIDELINES FOR MARKING**

### **2/3 Unit and 3 Unit Written Papers**

All questions are marked out of 20 and then scaled to the exam question mark by computer.

By a process of discussion and pilot marking, the accepted responses and marking scale are developed for each question. The various marks ranging from high to low are developed to include all aspects of the question. Checklists are developed for each question to assist markers in ensuring candidates have addressed each aspect of the question.

The marking schemes are contained in this report.

### **Multiple Choice Questions 1-10**

The Examination Committee presents a set of answers for the Supervisor of Marking to consider. A selection of Senior Markers and Markers confirm the best answer for each question. The answers are then sent by the Supervisor of Marking to the Board of Studies to be machine marked.

Candidates' responses and the most correct answers follow in this report.

### **2/3 Unit Major Design Project**

During late Term 3 pilot marking and HSC marking of each candidate's Major Design Project took place. Pilot marking took place over one night and two days. Each member was trained to mark all types of projects according to the marking criteria as set out in the *HSC Subject Manual No. 6*. Regardless of expertise or background each marker was trained to mark the full range of projects and technologies presented.

Prior to pilot marking the Senior Markers marked the projects for pilot marking and developed a bench mark for each of the projects used to train markers. Each marking team (of 2 markers) marked 4 to 5 projects each session and discussed marks between themselves and Senior Markers. Each marker was supplied with a checklist devised from the marking criteria to assist in ensuring that each candidate covered the criteria of the Major Design Project. Each marker was continually checkmarked by Senior Markers and had to make adjustments to his/her marking until the whole group of markers was consistent in its approach and awarding of marks.

Each marker practise-marked approximately 25 projects before they arrived at the first centre/school for marking. During the course of marking each team was checkmarked a minimum of 4 more times to ensure uniformity in marking.

Markers are trained to mark and apply the marking criteria to any project presented.

The checklist used to assist the markers is contained in this report.

### **3 Unit Specialised Study**

The Specialised Study is sent to the Board and is marked at the same time as the written paper is marked in December.

Each report is marked by two teams of two markers. The first team's members mark independently and then arrive at a common mark. The second team, unaware of the first team's mark, goes through the same process.

Marking is kept precisely to the marking criteria as set out in the *HSC Subject Manual No. 6*.

When markers consider a study to be excessive in length it was given to a Senior Marker who carried out an accurate word count. The supporting materials, 2/3 Unit Major Design Project folio extracts, maps, charts, drawings, computer print outs, video or audio tapes were not included in any word count. Only words relating to the study itself were counted. If the study was substantially over 2000 words, the study was marked according to the criteria but no extra marks were gained for work in excess of 2000 words. Less than 10% of Specialised Studies were considered to be excessive in length; however, some studies were as long as 5000 words. In many respects the candidates who exceeded the word limit could be regarded as placing themselves at an unfair disadvantage as opposed to those candidates who abided by the rules in HSC Subject Manual No 6 and kept to the word limit.

It is reiterated that candidates must keep to the word limit of 2000 words.

## **HSC MARKING PROCEDURE**

The Multiple Choice Questions 1-10 in the 2/3 Unit (Common) paper are machine marked.

All other questions in the 2/3 Unit and 3 Unit Written Papers were double marked. The second marker was unaware of the first mark. All questions were marked out of 20 and then scaled by computer to the final mark per question. If the discrepancy between the first and second mark was 6/20 or greater it was third marked.

Each marker kept a tally of the marks he/she awarded. These marker tallies were statistically examined each day and were a check, along with checkmarking by the Senior Markers to ensure accuracy of marking and a full ranking of candidates.

In the 2/3 Unit Major Design Project, again projects were double marked with frequent checkmarking by Senior Markers being involved. To maintain excellent uniformity and consistency among markers the discrepancy was much tighter. If the mark difference between the first and second mark of the marking team was 7 or greater out of 60, markers discussed and marked again. If the discrepancy still could not be resolved a Senior Marker was contacted for a third mark to be completed.

In the 3 Unit Specialised Study each study was marked by two teams of two markers. If the first and second mark differed by an amount determined by the Board, it was considered discrepant and required a third mark.

## **CLERICAL PROCEDURES**

All scripts are kept in bundles according to each Examination Centre. Strict confidentiality is maintained at all times. Scripts are distributed to, and collected from, markers by the Senior Markers only. Senior Markers ensure that a marker does not get papers from his/her school to mark. It is not permitted for markers to find out the names of schools they have marked.

Markers do not record any marks on the scripts. They complete the mark on the marksheet which accompanies each bundle of scripts. After the first mark the marksheet is removed and a second blank marksheet is put on the bundle ready for the second mark. Both first and second marks are completed independently.

# **MAJOR DESIGN PROJECT REPORT SHEET**

## **SECTION II (60 MARKS)**

### **Proposal**

This was frequently not adequately documented in terms of identification of the needs leading to the development of the project, areas of investigation and criteria to evaluate success and, therefore, many candidates were not able to reflect this in their Evaluation section. If a proposal was done well it was clear to see the 'direction' of the project. When done poorly, or omitted, the projects lacked direction and were generally, hard to follow.

### **Management**

A number of candidates failed to show evidence of project management in their folios, and this was sometimes reflected in the realisation of the product, system or environment. Some candidates simply stated 'I am going to make project 'A' with material 'B''. There was little or no evidence of design development. In such cases folios were generally disorganised.

The better candidates planned (predicted) their actions before undertaking the realisation of their projects, and then evaluated their management both throughout the development and realisation, and after the project was completed. Those who did well in this section had generally laid out and followed clearly defined plans.

Time, Action and Finance Plans were often in the form of a diary of past events, rather than of prediction and evaluation. In some cases it was obvious that they were written after the project was completed, since some action plans linked almost identically with the diary. Many action plans failed to identify design, research and testing and only documented the construction of the project.

Many candidates could not distinguish between a finance plan and a list of receipts paid for resources.

Identification and justification of resources were poorly handled. Many identified the material resource that they used (eg aluminium, dacron) but failed to justify why they selected it, rather than other materials which may well have been available. A large number of candidates did not acknowledge other resources such as tools, techniques, energy, finance, information, time, skills and human resources such as teachers, parents and industry contacts.

A number of folios were based on the requirements of the former Industrial Technology syllabus. Consequently, those students failed to address many important syllabus requirements.

### **Development and Realisation**

Candidates generally did best in this section. Some, however, failed to show any developmental stages and their project was a realisation of their first and only design.

Good candidates generally based their project on thorough and relevant research, with testing and experimentation included and clearly identified. In such cases decisions about the selection of materials, tools and techniques were related appropriately to the original project proposal and to the criteria for evaluation. Good candidates included evidence of testing through models, samples, photographs, videos etc.

In many cases, however, evidence of research was weak and too often took the form of a folio, or folios, full of brochures, without clear identification of the relevance of aspects of these brochures to the project. Students need to keep in mind the importance of evaluating research and experimentation. Design development from initial ideas and concepts was poorly documented, with many candidates stating almost from the start a finite and inflexible plan.

The majority of candidates must obviously have explored and conducted tests and experiments to achieve the high standard of work presented but few recorded them in their folios. Testing and experimentation were often included as an afterthought rather than as a means to an end solution. In many cases, little or no experimentation or testing was apparent.

Graphics need to be relevant to the sequential development of the project. Practical skills varied widely but were generally of a high standard, and the evidence of the practical skills was generally well documented.

The better candidates who tried to be innovative usually encountered problems and tried to solve them. When documented well, these students improved the quality of their project. Generally, however, documentation in this area was poor, with little or no evidence of creativity. This was caused, most often, because students had little idea about design development – rather they chose a project and built it. Those who designed for the sake of innovation (rather than improvement) tended to sacrifice some quality in their final project. Any innovation made must be relevant, and an enhancement to, the design project.

Safety issues are always of concern. Where appropriate, students should get electrical projects tested and certified as safe by a licensed electrician. Evidence of safety considerations should be addressed in the students' folios. They should also provide an earth leakage safety cut out power supply. It was of concern to see the photographic evidence of students working on their projects in unsafe environments. Protective safety equipment should be worn by students when necessary.

## **Evaluation**

In most cases, evaluation was the weakest section.

Some candidates addressed their evaluation in terms of *liking it, being happy with the result or learning a lot*. Although this is a worthy sentiment, it does not address the examination evaluation criteria.

Evaluation needs to be ongoing throughout the project, as well as at the end, when it should reflect upon the project proposal. This was made easier in cases where the candidates had assessed market or personal needs (if appropriate), and then evaluated all aspects of their project according to those needs. When surveys are used the relevance of the questions needs to be examined closely as does the target survey group. Fictional survey results were easily identified. Market surveys were often contrived with findings frequently left unanalysed.

Evaluation varied from the excellent to non-existent. Evidence of evaluation throughout the project was often difficult to find because of poorly organised folios. Some folios included final evaluations, but often there was little or no evidence of on-going evaluation. Candidates had obviously evaluated and made decisions throughout the project but had not bothered to document the facts.

Good candidates had not only provided on-going and final evaluations but had also had other people (eg peers, experts and potential end users) evaluate both their design development and their solution.

Functional and aesthetic criteria were rarely addressed, and many candidates seemed to have a poor understanding of the meaning of these terms. Similarly, the impact of their project on society and the environment was rarely addressed. This was often hindered by a poor choice of project.

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The following checklist (page 11) was used by practical markers to mark the 2/3 Unit Major Design Project. The checklist sets out the examination criteria in a form to assist markers as they mark candidates' projects. Ten candidates may be checked with this checklist.



## 2/3 UNIT COMMON EXAMINATION

### SECTION I : WRITTEN PAPER (40 marks)

#### PART A (Multiple Choice Questions 1-10) (10 marks)

- QUESTION 1. 32% of candidates correctly chose B. A large number incorrectly nominated D.
- QUESTION 2. 36% of candidates correctly chose B. A large number incorrectly nominated D.
- QUESTION 3. 20% of candidates correctly chose D. A large number incorrectly nominated B.
- QUESTION 4. 65% of candidates correctly chose A.
- QUESTION 5. 77% of candidates correctly chose A.
- QUESTION 6. 88% of candidates correctly chose C.
- QUESTION 7. 85% of candidates correctly chose B.
- QUESTION 8. 84% of candidates correctly chose D.
- QUESTION 9. 69% of candidates correctly chose D.
- QUESTION 10. 38% of candidates correctly chose A. A large number incorrectly nominated C.

#### General Comment

Multiple choice questions require careful reading and reflection before an answer is given. Candidates are reminded that they are to 'select the alternative A, B, C or D that best answers the question'.

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#### PART B (15 marks)

##### QUESTION 11

The following is the marking scheme for Question 11. It contains a sample answer with marks allocated and annotations for clarification.



QUESTION 11. (Continued)

(b) MARKS

(i) Select a technology that has recently been introduced into ONE of the organizations identified.

I ANY SUITABLE TECHNOLOGY

(ii) Describe TWO ways in which this technology has benefited the organization.

I EXAMPLES 1. \* INCREASED EFFICIENCY } ONE RESPONSE ONLY
\* WORKER MORALE }
2. \* REDUCED COSTS } ONE RESPONSE ONLY
\* IMPROVED PRODUCTIVITY }

\* NB IF (b)(i) IS NOT ANSWERED THEN 1 MARK MAX FOR (ii)

(iii) Describe the impact of the introduction of this technology on the workplace.

I EXAMPLES \* STAFF NEEDED TRAINING
\* IMPROVED WORKER HEALTH
\* REDUCED ACCIDENTS, EYE STRAIN

\* NB IF DOES NOT RELATE TO (b)(i) 1/2 MARK MAX

(c) There are processes in place to assess the possible introduction of new technologies in BOTH organizations. Compare these processes.

2 APP
- R & D DIVISION RECOMMENDS TO BOARD OF DIRECTORS, DISCUSSION, DECISION MADE
WOODSMITH
- OWNERS GET INFORMATION FROM MAGAZINES OR TRADESHOWS, INFORMAL DISCUSSION, DECISION MADE

\* NB REASONED RESPONSE REGARDING THE PROCESSES USED TO ASSESS THE INTRODUCTION OF NEW TECHNOLOGIES. 4 MARKS. DISCUSSION OF NEW TECHNOLOGIES 2 MARKS MAX.

QUESTION 11. (Continued)

(d) For each organization, describe the management processes used in the areas listed below.

**Production**

MARKS

Organization 1

$\frac{1}{2}$   
 $\frac{2}{2}$

ON THE JOB DELEGATION  
.....  
DIRECT DELEGATION.

\* ALSO ACCEPTED THE  
PROCESS OF MANAGEMENT  
OF PRODUCTION  
E.G. DESCRIPTION OF  
PRODUCTION FLOW.

Organization 2

$\frac{1}{2}$   
 $\frac{2}{2}$

PRODUCTION MANAGER DELEGATES JOBS  
.....  
IN TEAM MEETINGS

**Marketing**

Organization 1

$\frac{1}{2}$   
 $\frac{2}{2}$

OWNER MAKES DECISIONS

\* ALSO ACCEPTED THE  
PROCESS OF MANAGEMENT  
OF MARKETING  
E.G. CONTRACTING OF  
MARKETING COMPANY

Organization 2

$\frac{1}{2}$   
 $\frac{2}{2}$

CORPORATE DECISION THROUGH  
.....  
MARKETING CONSULTANT.

(e) Compare and contrast how each organization ensures the customers' needs are being met. Use at least THREE examples for each organization.

$\frac{1}{2}$

ORG. 1 QUALITY ASSURANCE / TQM

$\frac{1}{2}$

ORG 2 VISUAL INSPECTION OF GOODS LEAVING FACTORY.

$\frac{1}{2}$

ORG. 1 SURVEY BY MAIL

$\frac{1}{2}$

ORG 2 SURVEY BY WORD OF MOUTH

ESSAY STYLE  
OK.  
OFTEN WRITTEN AS  
ORG 1, 3 ANSWERS  
ORG 2, 3 ANSWERS  
OK

$\frac{1}{2}$

ORG I MARKET ANALYSIS / RESEARCH

$\frac{1}{2}$

ORG 2 RELIES ON OWN EXPERIENCE / CONTACTS

\* IF THE SAME GIVEN FOR BOTH ORGANISATIONS  
AN EXPLANATION SHOULD BE INCLUDED

Question 11 continues on page 8

QUESTION 11. (Continued)

(f) From your experience of these organizations, complete the table below. Use the example provided in the table as a guide.

<u>MARKS</u>		Input resource →	Process used →	Output goods and services
		e.g. Water	Irrigation	Vegetables
I	(i)	STEEL	C.N.C BENDER	CABINET
I	(ii)	TIMBER	CONSTRUCTION	FURNITURE
I	(iii)	PAPER	PRINTING	POSTER

(g) Refer to the outputs listed in part (f) (i), (ii), and (iii). Analyse the ecological consequences of the process used for TWO of these outputs.

MARKS

Output 1

FURNITURE - DEPLETION OF FORESTS, REPLANTING FOR SUSTAINABLE YIELD.

EXAMPLS

I

SPRAY PAINTING - FUMES, HEALTH AND SAFETY ISSUES

Output 2

\* ONE RESPONSE REQUIRED FOR EACH

CABINET - BENT FROM STEEL, C.N.C ENSURES MINIMAL ERROR, REDUCED WASTE, HIGH PRODUCTION EFFICIENCY.

JEWELLERY MAKING / CASTING WASH PRODUCES POLLUTED WATER REQUIRING MANAGEMENT.

EXAMPLS

I

## QUESTION 11

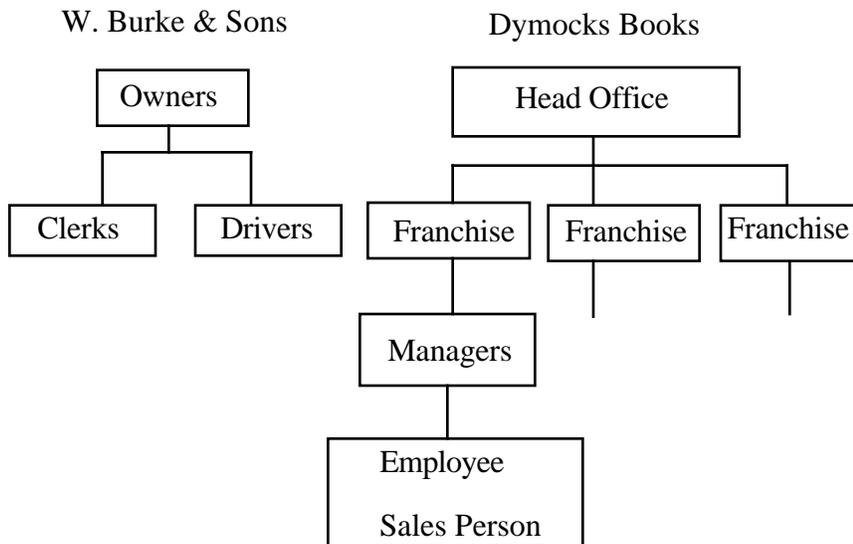
### Markers' Comments

Most candidates showed that they could identify two Organisations and were able to note location as well as Goods and Services for each.

- (a) This was well done by most candidates with the best responses clearly identifying both organisations' structure and size. Some candidates made good use of diagrams to show organisation structure.

A typical response was:-

*W. Burke and Sons is a small business owned by three brothers ... and employ a small number of people to drive trucks. Dymocks Bookshops is a large company with stores throughout Australia. It is a franchise where each store is owned by a different person. A large number of people are employed ...*



A typical misinterpretation saw candidates answer in terms of physical size of buildings and/or factory site.

For example:

*Boral Mill is situated on a square Km site while Panasonic is restricted to a high rise building. The structure of Boral is all made of wood frames and tin roofing ... Panasonic is in a building with underground car parking, verandahs and non-slip tiles ... and airconditioning and canteen.*

- (b) (i) Well answered by most candidates. Better responses mentioned specific technologies.
- (ii) Where candidates nominated a specific technology in (i), these responses were well done.

- (iii) Many candidates were unable to clearly identify impact on the **workplace** . There was a lot of repetition of responses in (ii).

A typical good response was:–

- (i) *Aerial Bundled Cable (ABC)*
- (ii) 1. *Saves time and money because instead of lots of different cables ... only one is needed.*
2. *Insulative Plastic (XLP) prevents bushfires when cables come in contact with trees.*
- (iii) *It is much safer to work with when it is live. It lightens the load on service trucks and so leaves more room for safety and lineworking equipment.*

- (c) Well answered by most candidates. Good responses identified the processes used to assess new technologies and stated who was responsible for the related decision making processes.

For example:

*At W. Burke and Sons ... price and running costs would be assessed. Final discussion between the two managers and a decision would be reached.*

Some candidates misinterpreted the question and simply noted technologies in the organisation with no assessment process noted.

For example:

*Technology such as machines ... cuts precise sizes ... and a computer that is able to show a 3D kitchen ...*

- (d) Many candidates were unsure of the meaning of ‘management processes’ and answered either in terms of who directed the process or the actual process of managing the production and marketing activities. Both were equally acceptable.

A typical answer was:

### **Production**

*Day supervisor/secretary receives the order, gives it to the workers who pack it, day supervisor evaluates remaining stock and orders new seeds if necessary.*

### **Marketing**

*Owner talks to customers and retailers about what plants are most popular ...*

- (e) Very well answered by most candidates. A variety of mechanisms for meeting customers needs were put forward and showed a good understanding of the organisations visited.

For example:

*Gourmet Kitchens After market service and assistance (warranty).*

*Kitchens customised to clients needs.*

*Up-to-date colours, fashion and range.*

*Plant Co. Australia Phone number on packaging for customer feedback.*

*Advice given with planting.*

*Wide range of plants tested to market needs.*

- (f) Most candidates answered the question well and understood the concept of input resource, process and output.

For example:

*Cardboard----- Printing -----drink promotion poster.*

*Aluminium ----- Diecasting -----engine rocker covers.*

*Brass and Copper ----- Casting -----taps and plumbing fittings.*

Some candidates misinterpreted the question and did not name the 'process' or tried to use the examples given, transposed to the organisations they visited.

For example:

*Wind ----- windmill -----energy*

*Sun ----- solar energy -----electricity .*

AND

*Margarets Dresses don't use water ----- (no process) -----Margarets Dresses don't use vegetables.*

- (g) This part was very well answered by most candidates. The phrase 'ecological consequences' was mainly interpreted in terms of environmental factors and most answers reflected these issues.

A typical good response was:

*The result of manufacturing seat frames had a number of (ecological) consequences. First the process causes noise pollution as well as pollution of water which is a cause of the death of waterways. Scrap build up ... means a loss of valuable land as land fill.*

**PART C** (15 marks)

**QUESTION 12**

**Marking scheme with suggested answers**

There are many examples of design in our environment where functional criteria have been considered more important than aesthetic criteria.

- (a) Identify THREE examples of designs where function has been a major consideration. Justify your selection.

6 marks - 1 mark for each functional example  
- 1 mark for justifying each selection adequately.

eg. The function of a product is based on the efficiency of the outcome related to the initial need. Curtains are an example of a home furnishing where function is an important consideration. To be functional they must be sun resistant, have good drape, be easily laundered and be relatively strong.

- (b) Discuss the importance of aesthetic considerations in design.

4 marks - 2 marks for demonstrating an understanding of the term aesthetic.  
- 2 marks for discussing its importance in design.

eg. The term aesthetic refers to the physical appearance of an object. To evaluate the aesthetic qualities of a product is to evaluate its physical appearance, its qualities of beauty and visual appeal within its environment.

- (c) Some products are designed with built-in obsolescence. Using an example, explain the term 'built-in obsolescence'.

3 marks - 2 marks for an explanation of the term 'built-in obsolescence'  
- 1 mark for incorporating a relevant example.

eg. Built-in obsolescence in design refers to an item that has been produced with a pre-determined life span. Surf wear such as Billabong T-Shirts are produced each year with a new design on the front and back. Consumers of the T-Shirt (mainly teenagers) purchase the new design each season, discarding last year's shirt as it has become obsolete or out of style, even though that shirt may still be in good condition.

- (d) When developing designs such as city expressways, airports, harbour tunnels, country road systems, rail systems, irrigation systems, and shopping centres, environmental problems are created and must be addressed.
- (i) Use *either* one of the above examples *or* an example from your own experience to explain how environmental considerations impact on design.
- 3 marks - 2 marks for explaining how environmental considerations impact on design
- 1 mark for relating the response clearly to the example chosen.
- (ii) Explain the long-term costs and benefits considered by designers.
- 4 marks - 2 marks for explaining costs
- 2 marks for explaining benefits.

## Markers' Comments - Question 12

### General Comments

When students interpreted the question clearly it was well answered. Many students however did misinterpret the instructions and as a result only attempted one part of the question therefore losing valuable marks.

- Part A was where most candidates achieved the majority of their marks and overall was well answered.
- Part B was also fairly well answered, however many candidates did not have a clear understanding of the term aesthetic.
- Part C was poorly answered. The majority of candidates did not understand the term 'built-in obsolescence', or did not utilise a relevant example to support their response.
- Part D (i) was generally well answered. The shopping centre was a popular choice with better candidates. Environmental considerations impacting on the design were incorporated clearly into the response. Poorer candidates had difficulty explaining how environmental issues impacted on design prior to construction. Many described the environmental damage caused by design once completed.
- Part D (ii) was poorly answered. Vague concepts only were provided. Better use of examples would help candidates to clarify their meaning and consequently gain better marks.

### **Example of candidate's answer: Poor Response**

- (a) *I chose this question to show that time and money people and companies use to help consumers and most of the time is taken for granted.*

*The door, all doors to whatever, building, car has function first, too allow people or things to enter freely through it. To start you must consider what it is going to be used for. This is an excellent example of how function is important in design. Doors that don't work, width, height are nuisances.*

*Motor car today and all options coming with it make it safer and better in all ways. Today brakes have changed first from drum to disc because disc has greater power in strength and durability than the drum to make the car more safe. Then comes ABS to give the driver more control under heavy breaking and wheels do not slide under heavy breaking. All of which has been done so the car will function better in all conditions and all kinds of difficulties.*

*Cars today are meant to absorb the impact in case of a crash, materials and design of the car had to change because the cars of before were made solid looking like tanks, all this had to change because the driver takes full force in the case of a crash. The car is designed now to put the driver under less impact in the crash, this is due to materials change and design to benefit the driver and make the car more safer and more functional in the crash when it will happen. Air bags are another function for the driver, all benefits for safety when driving and buying the car.*

### **Markers' Comments**

- Worth 4 – 5 marks out of 20.
- Answer was confused and tended to incorporate an historical journey rather than a more specific response. This could have been avoided by answering in point form. The candidate used a car as an example but did not clearly indicate what the design's function was.
- The candidate has only responded to Part (a) of the question.

### **Example of candidate's answer: Excellent Response**

- (a) 1. *The push lawn mower – designed to cut the grass at a reasonably fast pace, but ignoring the effort and comfort of the user and also its' looks – new designs are being made.*

2. *Hairdryer – because it often looks quite ugly and does not appear to the consumer. Designed to dry hair. Although styles are changing.*

3. *Pencil – designed to write and draw but ignoring the comfort of the user and how appealing it is to the user. It has been the same for centuries.*

*(Each of the above examples remain unappealing)*

- (b) *Aesthetics is very important in design. Although a product may be able to complete a task or function successfully, a consumer may not want to purchase it because of the way that it looks. Aesthetics is particularly important when trying to sell a product because of the visual acceptability of society. The product must appeal to the consumer. The aesthetics of a product also relate to the trends in society.*
- (c) *'Built-in Obsolescence' is when a product or good is manufactured to last a certain time span and then fail to work correctly or work at all. This has been introduced into some companies to supposedly ensure that consumers will keep replacing the broken tec, product with another one of the same brand. This makes sure that there is a demand (constant) for a product. An example of this is the Electric Jug. Some jugs are quite good but others will often become faulty or fail to work just after the warranty has ended. The element will burn out or break and many times, parts are not made for the jug, so the consumer must purchase another jug.*
- (d) (i) *Shopping Centres can often cause environmental problems and therefore, design is impacted quite considerably. When new centres are to be built, it can be hard to find suitable and vacant land. Especially when new suburbs are being developed. Drainage and its' waste disposal, access to the centre – ie. roads etc and many other effects upon the environment must be considered when designing the shopping centre. Also the size of the building, the use of air conditioning and other building materials and their effect on the environment must be considered.*
- (ii) *Designers must consider the long term costs of such a development upon the environment. For example: on going waste production and air conditioning. Also pollution form traffic. These developments could cause problems with the environment which may be permanent or which could last a long time. Such as waterways in relation to fish population etc. Air quality also in relation to bushland or tree growth (if possible) in the air.*

*The benefits considered by designers would be that of profit and the services produced for the community as a whole.*

*Each must be evaluated carefully.*

### **Markers' Comments**

- Worth 19 – 20 marks.
- Clearly stated arguments targeting questions asked.
- Part (a) – Full marks awarded as the candidate has selected three relevant examples and justified functionality by giving uses for all three.
- Part (b) – The candidate has demonstrated excellent understanding of the term aesthetic and its importance.
- Part (c) – Well answered. The candidate has mentioned that the product has a life span that is pre-determined, and explains why this is so. A relevant example has been chosen.

- Part (d) (i) – The candidate has provided good examples of environmental problems and stated how these would impact on the design.
- Part (d) (ii) – Very well answered as the candidate has clearly interpreted the question providing relevant examples.

### QUESTION 13

#### Marking scheme with suggested answers

(a) A company has developed a new board-game, suitable for ages twelve to adult.

(i) Describe the market-research processes to be conducted to get the design to prototype stage.

<b>6 Marks</b>	3 marks	-	First process
	2 marks	-	Second process
	1 mark	-	Evaluation

Some acceptable answers included: surveys, consultancy, interview, prototype collate, evaluate, (some answers had sub-processes).

(ii) How could the company ensure that the idea for the game was not copied before production and distribution?

<b>2 Marks</b>	-	Must refer to legality and/or security
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Some acceptable answers included: copyright, patent, trademark, security, secrecy.

(iii) Describe the entrepreneurial procedures necessary to develop the large-scale production of the board game.

<b>6 Marks</b>	3 marks	-	First process
	2 marks	-	Second process
	1 mark	-	Additional process or sub-process

Some acceptable answers included: finance, marketing, production, capital equipment, site, raw materials, employees, training/skilling, forward planning, export market.

(b) For your major design project:

(i) briefly describe the realisation processes used;

<b>3 Marks</b>	1 mark	-	For each process (max. 3 marks)
			no repeats

Some acceptable answers included: research, testing, evaluating, production, (including sub-processes).

- (ii) compare and contrast these processes with those that may be used in large-scale production;

<b>3 Marks</b>	2 marks	-	First process
	1 mark	-	Second process (max. 3 marks)

Some acceptable answers included: design, CAD, testing, research, environment, production techniques.

## Markers' Comments

- (a)(i) Candidates were able to identify the need to find out what the target market was interested in. Most candidates could suggest market-research techniques as being survey and interview. Some described doing drawings to show a sample to the target market. Some gave examples of the types of questions that could be asked to gauge consumers' interests. Some suggested looking at existing board games to see what was popular on the market, ie. which games were selling the best. Some candidates were able to evaluate the data collected and describe how this could be used to formulate a prototype of the game.

Following are samples of responses which scored high marks.

- 1) *To find out what type of board game (eg. monopoly style) people like to play conduct a survey.*
- 2) *Research processes can be conducted by having surveys and finding what kind of game people already like to play and what they might want to see in a future game. Asking questions like:*
  - *What is your favourite board game?*
  - *With the answer research that game*
  - *What kind of game do you like to play, short or long*
  - *Why people like long or short.*
- 3) *The market research that would have been undertaken for such a board game, would include the following:*
  - *survey the target market, to decide upon the type of game they felt there was a need for.*

- (a)(ii) This part of the question was generally well attempted by the candidates. Most could identify the need to patent the game and for the company to maintain strict security during the production and distribution of the game. Other means of maintaining secrecy mentioned were trademark and copyright.

Some candidates misinterpreted the question. They indicated that the company should check with the patents office whether it (the company) had breached another company's copyright.

The better candidates described how a patent, copyright or brand name worked in the legal sense.

Following are samples of responses which scored high marks.

- 1) *Although a patent can not be taken out on a formula or an idea it could be on a brand name, so name the game as closely to the actual aim of the game to try to deter the opposition. Then keep it as secret as possible until the prototype is made. Then register it so no more illegal copies can be made.*
- 2) *To ensure the games ideas were not copied, the company could take out a patent on their idea, thus placing it under copyright. Although this can be expensive, it is the best means of ensuring that the improved features of the game are not stolen. If it was absolutely essential that ideas were not tested, the company could have its developers sign legal agreements not to divulge these ideas.*

(a)(iii) Candidates had more difficulty scoring full marks in this section.

The stronger answers described the marketing process including advertising and the creation of a large demand for the product before large scale production was started. Better candidates described the need for finance to produce on a large scale, the need for the entrepreneur to identify all the resources to produce the board on a large scale, such as employment of workers and skilling them, research and development, larger manufacturing site and retail outlets for the product.

Following is a sample of a good response.

*A marketing strategy for the game would be the first step in the entrepreneurial procedures involved in large scale production of such a board game.*

*The strategy would involve targeting the teenage to adult market, showing how enjoyable the game is and how it is a family game. It would then be a more viable option. It should be shown as a good gift, increasing its appeal as part of this strategy.*

*A related competition could be linked with the launch of the product. The company may issue the first 2,000 buyers with discount coupons for their next purchase of such a product. The cheap price of the game would be advertised and that it is on special. This advertising could be targeted universally and overseas markets could be looked into if there were great interest in the product.*

(b) (i) Generally this part (b) was poorly answered in comparison with the quality of answers in part (a).

Many students had difficulty in understanding the term 'realisation' and consequently scored poorly.

Better responses discussed market research, testing of materials used as well as other resources used to complete the major design project. Many students

wrote about how they determined to make their major design projects, reasons behind the choice and decisions they made. Candidates then went on to discuss how they made their project.

Following are samples of good responses.

- 1) *I didn't have a lot of money for my MDP, so one of the realisation processes I used was a budget that I had to stick to.*
- 2) *The realization processes used were research then making. Pieces cut to size and then used lathe work ...*
- 3) *In my MDP the realisation process I used was to first establish the need, then research the relevant aspects of materials (fabric properties and sewing techniques). The design development of each garment was part of the realisation – the development of each design to the final stage and then the making of the product.*

- (b)(ii) Candidates generally realised that for large scale production a company would have greater resources available to them such as finances, more extensive market research facilities. The data collected would be more comprehensive and collected from a broader range of the potential target market. Better answers identified the better quality materials and technologically advanced equipment available to a large business. They mentioned access to better designers and target market analysts.

Some candidates highlighted the similarities between their major design project and its production in large scale, while some noted the costs for a large company would be smaller because of the scale of production.

Following are samples of good responses.

- 1) *The construction process would differ in a large company because of technology of equipment ... different people would make different parts.*
- 2) *In my MDP I surveyed a limited number of people and used general word of mouth responses in establishing the need for my project (a specialist fashion line).*

*If it was for large scale production, the production company would undertake more research into current fashion trends as well as more extensive market research. The company would develop strategies to promote their product to outlets or consider opening their own retail outlet.*

*The company would need designers to come up with original and appealing designs.*

*In the realisation of these designs the company would need to take into consideration the cost of materials and specialist equipment eg industrial machines for leather and a walking foot for spandex and vinyl. They would also need to consider the level of skills of the employees and employ or train people who were able to work with these materials.*

*All these things are developed in response to the level of production required to meet customer demand.*

## QUESTION 14

Candidates were marked out of 20 according to the marking scheme. Markers were asked to:

- Skim read a student's response to develop a feel for the 'design package'.
- Clearly identify which project the candidate is developing.
- At all times throughout the marking of a paper remember that markers are endeavouring to award marks and not deduct.
- Candidate responses will vary from an open essay type to a regimented (a), (b), (c) etc. response. In any of the types that are confronted remember at all times that markers are trying to compile marks and as such marks from different sections of the marking scale can be found throughout the entire student response.

### Marking Scheme

- (a) 'State your selection' – no marks are available for this response – be careful here that a student's response may include a description of their ideas and as such can offer marks for section (d).
- (b) A total of four marks are available. **For full marks a candidate must identify 4 criteria**
- outline only = half marks                      outline and justify = full marks
- NB: the criteria identified must be those relevant to the designer and NOT the end user. If the criteria relate to the end user then half marks apply.
- (c) A total of four marks is available. Whilst each criterion **must** be addressed, each may be treated to a different extent – be reasonable. If only 1 or 2 criteria are treated then up to three marks can be awarded if a thorough treatment is given.
- (d) A total of five marks is available. From description/sketches etc. throughout the entire response, attempt to identify 5 different and relevant features targeting the **end user** . Be careful of repeated features.
- (e) A total of four marks is available. Responses **must** relate to the criteria identified in (b). The response must also relate to the information supplied in (d). For each criterion evaluated = 1 mark. 4 criteria must be addressed to achieve full marks.
- (f) A total of two marks is available. Requires only one strategy to be identified. The strategy **must** be aimed at **the project developer** and NOT the end user, eg. models, AV presentations, computer simulations etc. may be suggested.

Suggestion = 1 mark

Justification as to why this suggestion is appropriate for this design = 1 mark

## Markers' Comments

### Part (a)

The greatest number of candidates selected the viewing area for observing Uluru. Fewest candidates selected a workstation for physically handicapped persons.

### Part (b)

Most students had no difficulty in identifying FOUR important criteria the designer would need to consider.

A number of candidates were unable to justify these criteria or say why they were important.

Some candidates simply listed design criteria and provided no justification for their inclusion in designing the facility.

Example:

*This workstation would have to follow a strict and considerate set of guidelines which involve keeping in mind at all times that the person we are designing for is physically handicapped. Important criteria which would need to be considered is:*

- *easy access to and from the workspace need to be considered*
- *simple and easy access to every facility around and in the workstation*
- *design of any technological equipment should be considered*
- *if communication is required then it is important that the equipment be considered and appropriate action taken.*

More capable candidates presented a wide variety of design criteria relating to environmental, safety, social, structural, cultural, ergonomic and ethical issues associated with their intended designs.

Example:

*Firstly the design cannot infringe on the rights of the Aboriginal owners. Because it is an extremely sacred, Dreamtime element, any development must be approved by the Aborigines concerned.*

*The viewing area must not detract from the appearance of The Rock. Simply because Uluru is such a well known Australian symbol and is appreciated for its natural and undamaged charm, any development must not interfere with its environmental aesthetics.*

*The viewing area's design would need to hold large capacities, and/or constant usage. It would need to be permanent and contain elements desired for a tourist viewing area. Space for (how many) bus loads, handrails, lighting, seating (in case of disabled or elderly viewers), and obviously a clear, unobstructed view of The Rock.*

*Lastly is the factor of cost. This viewing area, if not temporary would clearly have a large cost involved. Any materials or labour used would have to be of the highest*

*quality to ensure a lifetime of usage, and for the appearance factor – as it will be seen by, and used by multitudes of tourists.*

*The moral/ethical, environmental, practical and financial aspects would all be extremely important in designing a viewing area for a valuable and delicate place as Uluru.*

Few candidates showed an understanding of what a workstation was. They chose to interpret the ‘workstation’ as a whole environment (house, place of business, sheltered workshop) and designed modifications to such an environment.

Issues such as transport and ramps were most often discussed (these issues are important, but are of limited relevance to the question). Many candidates showed little insight into the needs of the physically handicapped and often described them in condescending terms.

### **Part (c)**

Many candidates were unable to extrapolate on their design criteria presented in Part (b). They tended to repeat themselves and outlined the same or additional design criteria, rather than explaining how each of the selected design criteria would influence the development of the design.

Better candidates kept the concept of designing for the project developer at the fore front of their explanation and provided explanations in terms of cost, functionality, durability and environmental impact.

Example:

*The designer needs to consider several important things like*

- *The place must not only have stairs, it ALSO MUST have a slope (ramp) for eg*



- *The doors must be wider than normal doors because people who are handicapped and who are sitting on wheelchairs need wide doors to fit.*
- *All the light switches, fans switches must be lower than normal because people who are on wheelchairs need to reach them.*
- *Garage's for buses must be built because busses will pick up physical handicapped people and take them where they want to go.*

- c) *They will influence the development of the design because we have put in account things that we need for disabled physically handicapped people like slopes for wheelchairs, widened door, bus deliveries and light fan switches low so that everybody could reach.*

**Part (d)**

This section was generally well answered. Candidates expressed themselves through a combination of annotated sketches, descriptions and flowcharts.

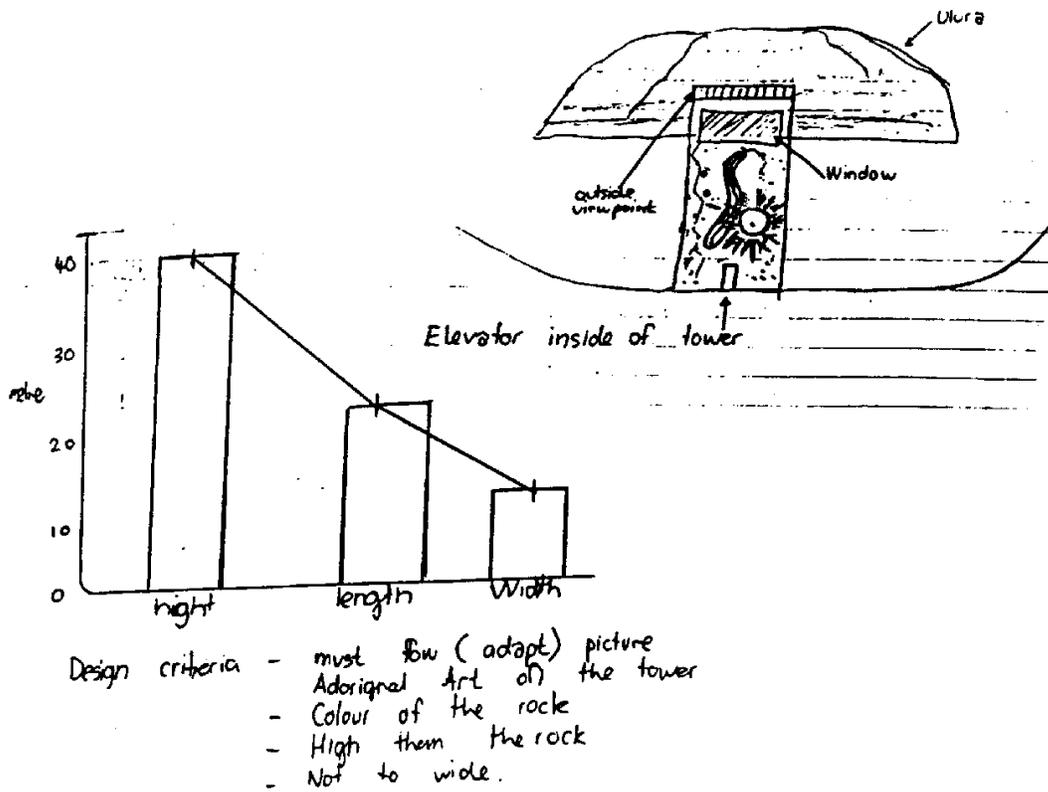
Some candidates presented one design concept with a number of features, while others provided a range of alternative designs.

Some forms of communication, particularly graphs were used inappropriately by candidates to provide initial design ideas.

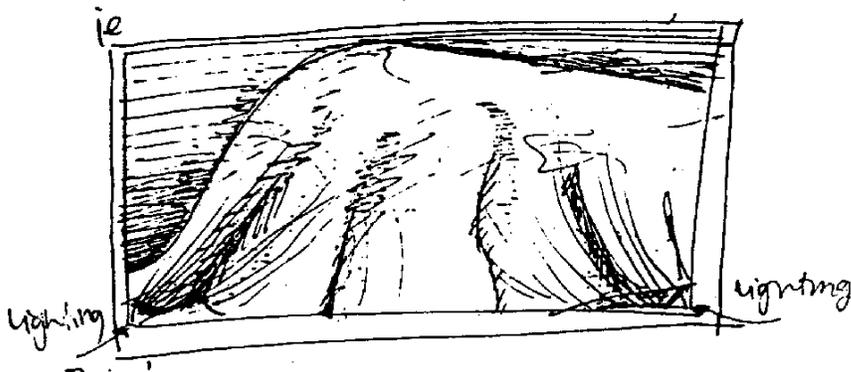
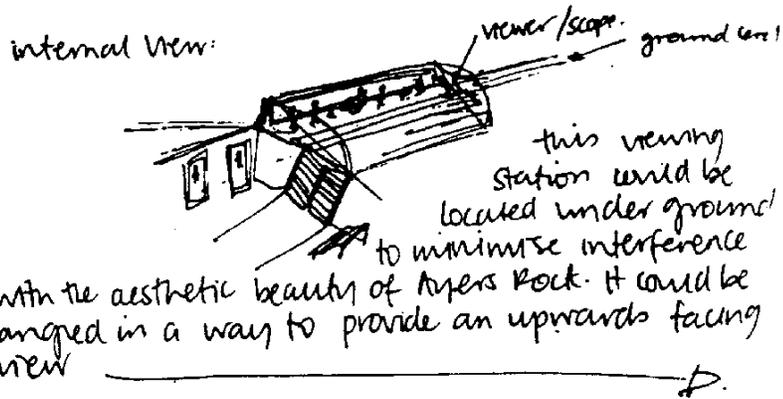
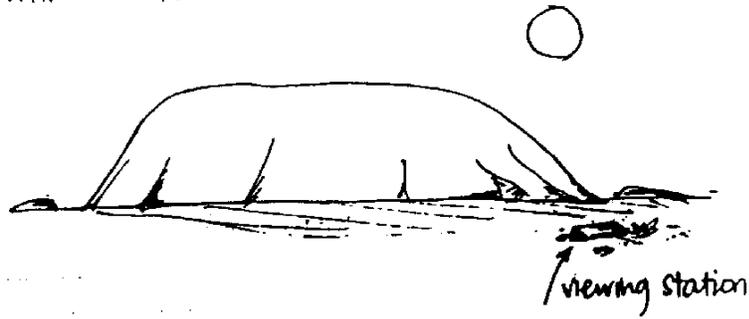
Some responses were not well organised and candidates presented design ideas throughout their responses instead of outlining, justifying and explaining design criteria.

Viewing platform designs varied from simple platforms, to towers, camouflaged environmentally integrated viewing environments, glass bottom planes and airships. Some candidates incorporated a viewing area **on or attached to** Uluru, negating or contradicting their environmental criteria.

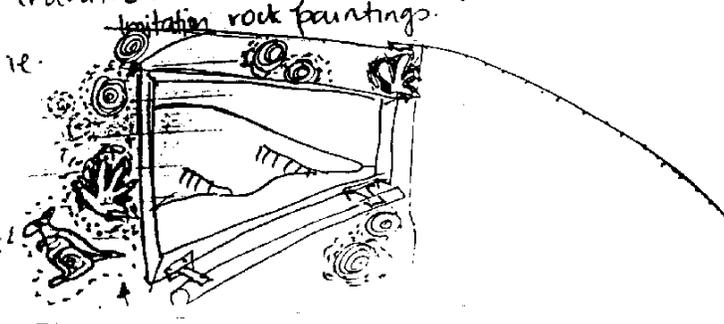
Example:



INITIAL DESIGN SOLUTIONS.



The internal walls of the studio could incorporate the Aboriginal heritage of Uluru, containing rock paintings (replicas) and traditional Aboriginal designs.



In designing a people-mover for a theme park, most candidates designed a vehicle type of mover. Some candidates used examples of moving walkways. Some candidates focused on the term 'theme park' and provided design ideas for rides such as roller coasters, or combined ride/people-movers such as monorails.

### **Part (e)**

More capable candidates related ideas presented in Part (d) to the criteria identified in Part (b). A number of candidates provided subjective evaluative comments such as 'it works well' but were unable to justify such statements in terms of the criteria they had established.

*(e) The design for my viewing platform meets the proposed criteria; As the platform will be made from a strong material, thus being stable and steady.*

*It is also accessible with a set of stairs for those who will use them and a steadily sloped disabled and elderly access ramp. The ramp surface also has grip and hand rails to ensure safety.*

*The viewing platform will and is high enough and close enough so that it is easily viewed and photographs can be taken. The viewing platform meets with the last criteria as the colours used will match the desert scenery and atmosphere and the shape of the dome is almost a repeat of the shape of Uluru (Ayers Rock).*

### **Part (f)**

Most candidates were able to suggest promotion ideas or concepts rather than strategies. In addition, many of these were aimed at the consumer or end user, rather than the project developer.

Many candidates found it difficult to justify their strategies in expressing why the strategy suggested was appropriate for their particular design.

Example:

*... everybody wants a picture of the rock, not just from the rock and The only picture they can take at the moment is bits and pieces of it or from a long way back and definitely not from an elevated position.*

Better candidates suggested a range of actions and modes of presentation for their promotion strategy.

Example:

*(f) First I would draw more drawings, like some rendered perspectives to present to the developer, to get a better overall look at how the building would look. I would research the best materials to use in construction and submit them to the developer. I would build a small model and ask possible people who may use the area, what they think. I would carry out small tests to test materials for strength and durability as well as aesthetic appeal.*

*All of the testing and development would be recorded and evaluated in a folio as well as photographs and maybe video of other similar buildings.*

*I would present all of the information from drawings, market research to testing, to the developer in a folio, to see if they meet the criteria for the developer.*

### 3 UNIT

#### SECTION II – SPECIALISED STUDY (30 Marks)

The Specialised Study includes both the research and development of a concept related to the 2/3 Unit (Common) Major Design Project and the documentation of all the steps involved in this process.

Very good Specialised Studies were those in which candidates included clear and adequate, but not copious, extracts from their Major Design Projects. Very good students were able to discriminate, and include extracts which adequately showed the nature of the 2/3 Unit MDP and how it lent itself to the option chosen.

Candidates who did not submit extracts from their Major Design Projects were not able to satisfactorily verify and show the relationship between the Major Design Project and the Specialised Study and hence were not awarded marks in the Proposal section of the marking criteria.

#### Proposal

Very good students chose options which were appropriate for the further development of their particular Major Design Project. Students should consider their 3 Unit Study when developing their 2/3 Unit Major Design Project. The Major Design Project must lend itself to further development if the 3 Unit Study is to be both possible and successful. Students who considered this when developing their Major Design Project had more success, and were able to clearly identify and explain the relationship between the Major Design Project and the concept/option selected for further development, and analyse the appropriateness of the option developed. This enabled them to clearly and succinctly justify the study and establish precise, achievable aims. Identification of criteria for evaluation of success of the study was then both realistic and precise.

For example, a candidate's answer was:

*I elected to do a marketing strategy because I intend to produce and sell my soft toy designs or the manufactured soft toys if there is a worthwhile demand in the market. When producing the soft toys as my Major Design Project, it became evident that there was a growing demand. One shop offered to buy the patterns I had designed for the soft toys. This inspired me to investigate the possibilities of marketing my own soft toys for sale.*

*I am interested in craftsmanship, rather than mass production, so I did not elect to investigate the other option of developing a manufacturing system. I was interested in developing an innovative application. However, this soon changed from initial research, which indicated that there was more potential for traditional soft toys. I wanted my products to be accepted in the market place. If I was to design something different / non traditional, there was a chance that it would not be accepted. I felt that there was a sufficient range of fabrics and materials with which to construct my soft toys, so I did not feel compelled to improve these existing resources.*

*In the process of realising my 2 Unit Major Design Project, I developed a range of soft toys with accessories to individualise them. In my 3 Unit Specialised Study I intended to develop a marketing strategy in order to market these soft toys.*

*The main aims of the Specialised Study are to:*

- *Test the market for the sale of soft toys - are people really interested in buying my soft toys?*
- *Determine the appropriate market - do people want high quality hand crafted soft toys or would they prefer cheaper manufactured items?*
- *Identify types of consumers who would form my market - who buys soft toys?*
- *Specify the market requirements for soft toys - what designs, sizes and materials sell best?*
- *Determine the prices existing in the market - how much are people willing to spend?*
- *Determine the best method for distribution of the soft toys - how will they be packaged and transported?*

*These aims will be achieved and analysed by surveys, interviews and observation of existing practices and trends*

*In order to analyse and evaluate the results from the surveys, interviews and observations there must be some criteria used to evaluate success. Success will occur when:*

- *Enough people show interest in purchasing the soft toys.*
- *A price is established which will enable a volume of soft toys to be sold at a profit.*
- *The individualised features / accessories of the soft toys have been established in the market place to provide an adequate range without having a completely different design for each individual item.*
- *There is a method or outlet to sell and distribute the soft toys.*

Students who chose to follow the Specialised Study Examination Criteria identified in the *Subject Manual No. 6* were much better able to follow a clear direction throughout the study.

Average candidates tended to have a very generalised description of their proposal, with justification and aims not specific enough to give direction to their Study. Poorer candidates failed to identify the aims and justify the study at all. These candidates usually had no criteria for evaluation, or else included the evaluation criteria for their original 2/3 Unit MDP in this section.

## **Methodology**

Selection of an appropriate range of research methodologies, including both qualitative and quantitative methods of research, and critical analysis of the data collected, enabled very good students to achieve their aims. Better candidates were able to present the results and include specific examples of their research and subsequent analysis, rather than include copies of text material.

Design of research tools, which included but was not restricted to surveys and questionnaires, was well done by the better candidates. The range of methodologies used by better candidates included literature reviews, advice from consultants, observational research, both formal and informal interviews, questionnaires and surveys. Average candidates used only a limited range of methodologies, not always appropriate, and were not able to effectively design and implement research tools. Poorer candidates used only one research methodology, usually photocopied and included pages out of text books, and were unable to draw relevant or valid conclusions. Methodology selected by poorer candidates did not relate to the aims of the study.

Example of a candidate's answer:

METHODOLOGY

*Here is a selection of research methodologies that I could use:*

•	<i>Book research</i>	
•	<i>Interviews</i>	
•	<i>Surveys</i>	
•	<i>Consumer sampling</i>	
•	<i>Articles</i>	– <i>Journals</i>
		– <i>Newspapers</i>
		– <i>Magazines</i>
•	<i>Library</i>	– <i>Randwick library</i>
		– <i>School library</i>
		– <i>State library</i>
•	<i>Computer files</i>	
•	<i>Desk research</i>	– <i>Phone</i>
		– <i>Letters</i>

*Table 3*

*These are the research methods that I have selected to use:*

•	<i>Interviews</i>	–	<i>Thea Fitzpatrick, of ‘Little Roo’</i>
		–	<i>Belinda Bournazos, of ‘Kiducci’</i>
•	<i>Book Research</i>	–	<i>Marketing Theory</i>
•	<i>Surveys</i>	–	<i>Target Market</i>
		–	<i>Professionals</i>
•	<i>Articles</i>	–	<i>Newspapers</i>
•	<i>Desk Research</i>	–	<i>Letters</i>

*Table 4*

*Rationale for research methodologies selected:*

- *Interviews – This methodology was selected because it enables me to find out the different distribution methods available to small children’s clothes businesses. I chose Thea Fitzpatrick and Belinda Bournazos because they both run small businesses, and I would face the same circumstances in the clothing market as they do, as opposed to a large, established firm which has a solid financial/support system. From the interviews I can also find out the different pricing policies and promotional methods used in the clothing industry. Interviews are also a fast and direct method of obtaining information.*
- *Book Research – This method allows me to find out the framework of marketing theory. It ensures that the information obtained is correct and unbiased, and will assist in the development of my own pricing, promotion and distribution methods.*
- *Surveys – This method is the easiest way of discovering the opinions of the target market and professionals, and will help when I am developing my pricing, promotion and distribution methods.*
- *Articles – They provide up to date information and are easy to access. They can be of assistance when I am developing my method of distribution.*
- *Desk Research – This method of research will provide me with information on the protection of my label.*

## Critical analysis of collected data

Students who represented the results of their research succinctly, and graphically (eg. table form) when appropriate, were able to keep within the word limit.

Better candidates effectively critically analysed and examined their collected data, in relation to the aims of their Study, and were then able to draw relevant conclusions to validate their Study. These candidates were also able to evaluate their results in terms of the criteria identified in the proposal. Average students simply restated the results of their research rather than analysing them, and poorer students did not attempt this section at all.

Example of a candidate's answer:

### 7. The prime factor looked for when buying soft toys:

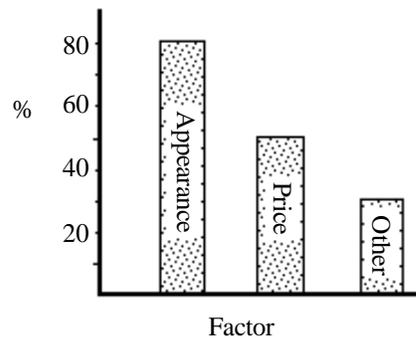
Appearance 80%

Price 50%

Other factors 30%

(Other factors include safety, quality, feel, durability, appearance/aesthetics)

Main reason for purchasing a soft toy



### 8. Most important features of appearance of a soft toy

Colours - 45%

Proportions 30%

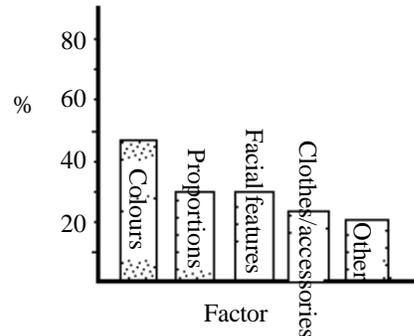
Facial features 25%

Clothes/accessories 25%

Other 20%

(Other factors included overall appearance, "cuddliness", materials used, resemblance to clowns)

Most important features of design a soft toy



**9. Is there room for improvement in soft toys on the market?**

Yes - 90%

No - 10%

**10. If "yes" what areas need improving before you would purchase one?**

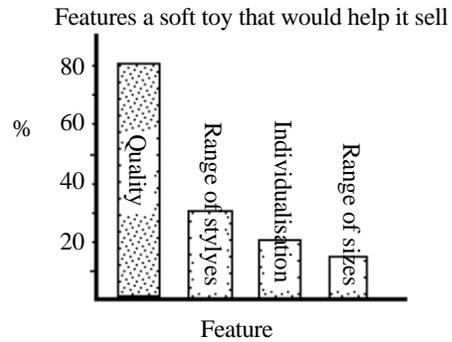
Quality 80%

Range of styles 30%

Individualisation 20%

(things that make them different/personal)

Range of sizes 15%



**11. Have you ever bought soft toys before?**

Yes 75%

No 25%

**12. If yes, who have you bought them for?**

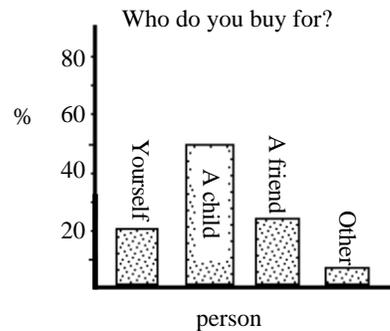
Yourself 20%

A child 50%

A friend 25%

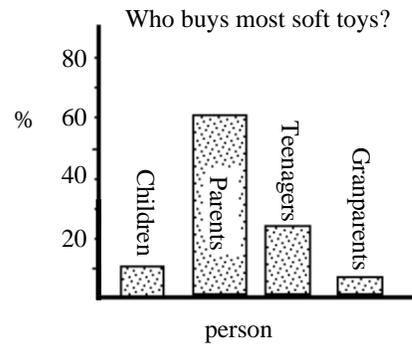
Other 5%

(relative, wife, husband, girlfriend, sick person)



**13. Who buys most soft toys?**

<i>Children</i>	10%
<i>Parents</i>	60%
<i>Teenagers</i>	25%
<i>Grandparents</i>	5%



**14. Price people are prepared to pay for a mid size soft toy, with clothes and accessories (shoes, shoulder bag)**

<i>Manufactured</i>		<i>Hand made</i>	
<i>Price \$</i>	<i>% of people prepared to pay this price</i>	<i>Price \$</i>	<i>% of people prepared to pay this price</i>
10	5	10	-
20	12	20	-
30	21	30	3
40	23	40	6
50	15	50	11
60	10	60	16
70	9	70	17
80	5	80	25
90	-	90	13
100	-	100	9
110	-	110	-
120	-	120	-

## **Conclusions**

*There appears to be room in the market for accessorised soft toys, which are hand made and are of high quality. People feel that there is room for improvement or diversification on the type of soft toys available.*

*People are prepared to pay more for a hand crafted soft toy (mode of \$80 compared with \$40 for manufactured item). In buying soft toys people appear to consider the quality of the item and price first.*

*In the appearance (visual design) of soft toys, people in the market place consider that colour, body proportions, features and accessories are all important. It was interesting that a few people surveyed felt dislike for soft toys which looked like clowns.*

*The reasons behind this response and other questions that were unanswered by the surveys will be answered by interviews and observation.*

## **Recommendations**

*There definitely appears to be a place for the style of soft toy I make. Considering the prices people said they would be willing to pay for the samples they were shown (my mid sized, hand crafted soft toy), it would definitely be profitable, bearing in mind the cost of materials and the labour charge I have put on my time. The only trouble I can see is having the time to fill all the initial orders and then maintaining demand over a long period. To do this I would need to develop a relationship with at least one retail outlet and develop a marketing strategy to sell my soft toys through this outlet, aiming mostly at parents who buy the most soft toys.*

## **Generation, testing and modification of ideas**

Generally, this section was very poorly attempted – retesting and refining of ideas was minimal.

## **Description and justification of resources used and processes undertaken to complete the study**

Better candidates included concise descriptions and adequate justifications of the resources used and processes undertaken. This was particularly effective when presented in table form, eg:

Resource/Process	Description and Justification
Patent Search	
Survey	
Interview	
Book	
Case Study	
Professional Assn	
Observation	
Experiments	
Consultant	

## End Result

**Synthesis of ideas leading to the development of the innovative application/new or improved resource/manufacturing system/marketing strategy:** Very good Studies were those in which candidates demonstrated their skills in synthesising ideas, and drew the study together in a logical and clearly explained way. Good candidates clearly identified their chosen strategy, system, application or resource and described it in terms of the aims of their proposal. (For example: *As a result of the study, the marketing strategy will take the following form:...*)

Example of a candidate's answer:

### ***End Result***

*From the surveys, interviews and research into production costs I established a price range of between \$60 to \$80 for soft toys about 50 cm high.*

*I established a product name for the toys and have been successful selling them to friends, relatives and workmates. Based on this success, I approached a retail outlet and they have taken a sample of the soft toys to sell on consignment. If this works we will work out a wholesale agreement.*

*Reviewing the criteria to evaluate success, I feel that the proposed marketing strategy has been successful in that:*

- *People have shown interest in purchasing the soft toys.*
- *A price has been established which will enable a volume of soft toys to be sold at a profit.*

- *The individualised features / accessories of the soft toys have been established in the market place to provide an adequate range without having a completely different design for each individual item.*
- *There is a method or outlet to sell and distribute the soft toys.*

*In addition, this study into the development of a marketing strategy has been a successful in that I have established that there is a need for the sort of soft toys I make and that there is an opportunity to develop a sustainable business.*

*The soft toys are well made and designed to last. In this regard they are environmentally sound. They are made almost entirely from natural fibres and so they will ultimately breakdown without harming the environment. I would like to go further and use organically grown cotton, dyed with environmentally friendly dyes. However at the moment it is difficult to obtain.*

*The ethical issues that need to be addressed include an awareness of the work of other soft toy designers and a care not to duplicate their work. Similarly, because my soft toy designs are unique, I need to protect my designs if I am seriously going to sell them in the market. This will entail applying for a patent with the Australian Patent Office in Canberra. The application document will need to include a patent request, providing details about myself as the designer, a written description and specifications of the designs and a filing fee.*

*Because the soft toys are for children, I have also had to ensure that they comply with the Australian standards for safety. The Standards relating to toys are available from the Australian Standards Association in Sydney. Without this compliance, I would not legally be able to sell them on the open market.*

### **Critical analysis of:**

#### **effectiveness of the study**

Very good candidates evaluated the effectiveness of the study in relation to the identified aims and evaluation criteria.

#### **viability of the study**

Very good candidates clearly understood the term ‘viability’, and were able to discuss whether the proposal would work, and if it was practical, in terms of the evaluation criteria identified. Poorer candidates either did not discuss the viability at all, or discussed the viability of the Major Design Project, rather than the proposal of the specialised study.

#### **potential impact on society and the environment of the proposed development**

Very good candidates discussed the impact of their proposed development on society and the environment in terms of the data they had collected and evaluated. Their discussions included reference to the broader rather than immediate environment, and reflected community, cultural, business and lifestyle issues and implications.

### **associated ethical considerations**

Better students were aware of relevant associated ethical considerations and commented on them appropriately. They included issues such as intellectual property and morality.

Example of a candidate's answer:

*Associated ethical considerations:*

*As I will be operating under a business name other than my own name, I need to register 'Outer-peel' with Consumer Affairs. This will ensure that my name cannot be used by another company. This registration costs \$75 for 3 years.*

*Additionally, as my label also consists of a symbol, I will need to take out a trademark on this as I will then have exclusive use of the symbol, legal rights and ownership. Once I have registered the trademark, I can be sure that it cannot be copied by other firms. This is necessary to ensure the protection of my intellectual property.*

*Also, when producing my garments, I need to take into consideration the Australian standards for labelling, sizing and flammability.*

*# See appendix 9 for information on standards.*

Poorer students did not complete this section at all, or were completely off track and included a brochure or sketch as an example of a product developed, rather than a critical analysis of a proposed development.

### **General Comments**

The Specialised Study is fundamentally concerned with the synthesis of ideas. Students need to be aware that the specialised study should be between 1500 – 2000 words. Very good candidates were able to present their ideas succinctly and include all the necessary explanations within this limit.

The appendix can and should be used to student advantage by including in it all the supporting material the student feels it is necessary to submit with their study. Support materials will not be marked, but may be used for the purposes of clarifying or illustrating information in the written documentation. Selection of materials for inclusion in the appendix should be qualitative rather than quantitative. Materials taken from literature and included in the Specialised Study should be acknowledged appropriately.

### 3 UNIT

#### SECTION I – WRITTEN PAPER (20 Marks)

Part A (Marked out of 30 and scaled to a mark out of 12)

#### QUESTION 1

#### Marking scheme with suggested answers

- (a) (i) List THREE examples of design-development activities where environmental issues are a concern. (Total of 3 Marks)
- emission controls on vehicles
  - use of recycled materials, eg. packaging
  - use of recyclable materials , e.g. packaging
  - production processes / methods
  - use of solar energy
  - development of electric vehicles
  - landscaping with recycled timber / compost / mulch
  - clothing – use of used natural material eg. cotton / wool
  - clothing – restriction of use of synthetics
  - food production, eg. composting, waste kept to a minimum
  - transportation, eg. airports, highways, tunnel
  - building, eg. housing – low impact – visual impact
  - furniture, eg. the use of recycling or using plantation timbers, wood chipping, etc.
  - urban consolidation and greening.
- (ii) Decisions made during these design-development activities will affect the environment. Describe the effects of the decisions made for each of the examples in Part (i). (Total of 3 Marks)
- lower carbon monoxide emissions
  - reduction in land fill waste
  - preservation of fossil fuels
  - reduction in contamination of waterways

- saving water, timber, adding nutrients to soil
- recycling natural material increase life cycle of product – saving on waste
- reduction in byproduct and to fossil fuels
- reduction in food wastage, adding to nutrients in soil when composting
- reduction in noise pollution, fuel usage, air pollution
- reduction in visual pollution
- reduction in logging of forests – increase plantation timbers. Moving away from planned obsolescence
- reduction of the urban sprawl.

(b) Briefly describe how EACH of the following groups of people can effectively influence those who control the design process to take a more considered approach to recycling and manufacture.

(i) consumers

- buying habits eg. rejection of non-recyclable products
- consuming habits eg. use of water, 'life cycle of product' (2 Marks)

(ii) retailers

- not stock poor items
- feedback to designers from consumers
- not waste resources in selling their products
- pricing structures, eg refunds, deposit,

cash back, trade-in

(2 Marks)

(iii) small manufacturers

- company policies
- design briefs
- education
- subsidies

(2 Marks)

- (iv) large manufacturers
- company policies
  - design briefs
  - education (2 Marks)

- (v) governments
- legislation
  - increased tariffs on non-recyclable products
  - developing mandatory standards
  - tax incentives (2 Marks)

(c) Material coding such as the recycling symbol shown in Figure 1 is widely used.



Fig 1 This symbol indicates that the plastic is recyclable.

The number indicates the type of plastic.

- (i) Discuss why material coding is vital for the success of an effective waste management system.
- sorting is faster (reduces cost)
  - consumers can tell what to recycle
  - can influence buying habits (not purchase non-recyclable goods)
  - allows consumers to understand (educate) more about plastics in general (3 Marks)

(ii) Explain why it is important for this coding to be globally accepted.

- to have an international standard globalisation
- imported products easily identified for recycling
- education across nations is vital for the environment
- product life cycles are more easily assessed (2 Marks)

(d) During the design process it is necessary to ensure that component materials within the product can be recycled.

Describe the methods that can be used.

- specifying recyclable materials
- DFD – design for disassembly
- ‘coding’ of components
- life cycle explanations eg. use of after finished with ie. clothing
- to avoid degradation
- standardise ‘common’ components. (3 Marks)

(e) How does the concept identified in EACH of the Figures 2, 3 and 4, convey an environmental message?

Figures 2, 3 and 4 are examples of goods that show either.

- the use of appropriate technologies; or
- consideration of recycling issues in their design.

They have also contributed to a form of visual communication that appeals to the environmentally conscious consumer.

Fig.2 ‘Papers’

- useful materials can be made from available resources without destruction of vegetation
- recycled products can be aesthetically pleasing and functional
- recycling of products, reduction of waste and reduction in depletion of natural resources
- renewable resource
- recycled materials, obvious textures for differing uses. (2 Marks)

Fig.3 'Cotton Garments'

- modern textile treatment can be unnecessary to achieve an appealing product
- low technology used to produce a viable commercial product
- no processing via chemical agency
- socially appropriate – village/cottage concepts.

Fig.4 'Sunracer'

- alternate power source is effective for transport, eventually reducing demand for fossil fuels
- importance of developing and promoting acceptance of 'low impact' power sources such as solar energy
- appropriate to the environment, ie. not much good in overcast conditions. (2 Marks)

## **Markers' Comments**

### **Question 1: (a) (i)**

This was generally well answered. However, some candidates had difficulty in clearly stating three design-development activities.

#### **Good Candidates**

Selected **activities** as opposed to products, where environmental issues could be addressed through the design-development process.

#### **Average Candidates**

Made a poor selection of activities which limited the discussion of environmental issues.

#### **Poor Candidates**

Selected products as opposed to activities and/or examples that were not current nor related to environmental issues.

### **Question 1: (a) (ii)**

#### **Good Candidates**

Related the effects to the design-development activities listed in Part (i). Outlined a specific decision that was made and clearly described the effects of this decision on the environment.

## Average Candidates

Described the effects only briefly, not relating them back to the decisions made in the design-development activities.

## Poor Candidates

Described decisions only with no mention of their effect, or, did not relate this section to the examples listed in Part (i).

The following is an example of one of the better candidate responses for Question 1: (a) (i) and (ii).

### *Question 1*

*a) i. Three examples of design-development activities where environmental issues are a concern are,*

*1. The lazer-grooved solar cells which is trying to reduce the use of fossil fuels and increase the use of sun light as a energy source.*

*2. The F2 free-way is an example of a design-development activity which concerns the environment as this Highway increases noise of close residence and destruct the many park land reserves.*

*3. The Norm Jennings, Dynamic lifter product which reduces the use of chemical fertilisation by the use of an organic fertiliser.*

*ii) Decisions make affect the environment in,*

*1. The lazer-grooved solar cell, reduces the use of fossil fuels, decisions during the development which effect the environment include, the stated objective 'to make solar cells more efficient' and the decision to incorporate as much recycled materials as possible is another.*

*2. The F2 Free way, decisions which affect the environment include, In certain areas where the development and design of the motor way was to cut through and destroy the bush land, in some areas the motor way will be under ground. The motor way being under ground, affects the environment because,*

*a) It reduces the noise pollution of the local area and b) it makes it possible to leave certain parks untouched.*

*3. The Organic fertilizer design-development activities affect the environment as, Norm Jennings made a decision to make a waste product, being chicken poo, into a useful product.*

### **Question 1: (b)**

Generally well answered, although many candidates seemed to get 'caught up' in the environmental issues and ignored the 'effective influence' aspect of the question.

#### **Question 1: (b) (i)**

Generally well answered.

##### **Good Candidates**

Described various ways consumers could influence ie. not buying goods, writing letters, organising protests, etc. These candidates also expanded on what each of these actually meant and the effects they would have. They also related market research to changes in the design of a product.

##### **Average Candidates**

Gave one method only with limited discussion, ie. not fully explained.

##### **Poor Candidates**

Did not relate how consumers can affect the people who control the design process – this connection was not made.

#### **Question 1: (b) (ii)**

Generally well answered.

##### **Good Candidates**

Recognised the type of retailers, ie. large and small and how each can influence those who control the design process, eg. in direct discussion with the designers.

##### **Average Candidates**

Mentioned that retailers could not stock poor products and did not specifically state the connection with the designers.

##### **Poor Candidates**

Showed a lack of understanding about the meaning of the term 'retailer' and the type of influence they can have.

#### **Question 1: (b) (iii)**

Generally poorly answered. Candidates had difficulty in distinguishing between the small and large manufacturers.

##### **Good Candidates**

Clearly showed understanding of what a small manufacturer is and the difference between small and large manufacturers. Discussed the capabilities of the small manufacturer in terms of their market.

### **Average Candidates**

Mentioned similar ways as those indicated for the large manufacturer, ie. did not differentiate between the two.

### **Poor Candidates**

Did not state how the small manufacturers can influence those who control the design process.

### **Question 1: (b) (iv)**

Generally poorly answered.

### **Good Candidates**

Recognised the difference of the power that large manufacturers have compared with the small manufacturers. Mentioned specific examples of how these larger manufacturers can influence those who control the design process.

### **Average Candidates**

Mentioned similar ways as for smaller manufacturers, did not distinguish between small and large manufacturers.

### **Poor Candidates**

Did not show how large manufacturers can influence those who control the design process.

### **Question 1: (b) (v)**

Generally well answered.

### **Good Candidates**

Gave specific examples of legislation that the government could introduce and the effect that it would have on those who control the design process.

### **Average Candidates**

Told what the government could do but did not expand on this ie., explain the effect of this on those who control the design process.

### **Poor Candidates**

Did not recognise the power of the government and the influence it can have.

The following is an example of one of the better candidate responses for Question 1: (b) (i) - (v).

*b) i) Consumers can buy product that have minimum package that will create waste. Consumers can also buy products that have recyclable packaging and after use recycle the package. It is in the purchasing of products that consumers can influence companies..*

ii) *Retailers can influence by stocking products that are recyclable or environmentally friendly ie. no excess packing that will reduce wastage and land fill.*

iii) *Small manufacturers can influence those who can control the design process by work actively with them. To tell how they want to produce/manufacture.*

iv) *Larger manufacturers are in a more powerful position to influence those who control the design process. They can influence with money, provided to research more effective ways that are more environmentally friendly. They can put pressure of designer by refusing to comply with them.*

v) *The governments can enforce legislation that will force design to take a more responsible approach to environmental and manufacturing issues. Funds/grants could be provided to encourage designers as well as making available more education on such issue, ie training programs.*

### **Question 1: (c) (i)**

Generally well answered.

#### **Good Candidates**

Presented a convincing argument giving a number of reasons why material coding is vital, specifically linking these reasons to the success of an effective waste management system.

#### **Average Candidates**

Listed some points but did not link these to form a cohesive argument.

#### **Poor Candidates**

Listed only one point and did not present an argument.

### **Question 1: (c) (ii)**

Generally well answered.

#### **Good Candidates**

Used a number of points to argue and showed a clear understanding/awareness of the term 'globally accepted'.

#### **Average Candidates**

Only included 1 or 2 points, and did not **explain** them or link them to form an argument.

#### **Poor Candidates**

Showed a lack of understanding and/or discussion of the term 'globally accepted'.

The following is an example of one of the better candidate responses for Question 1: (c) (i) and (ii).

*c) i) By coding the materials consumers can automatically realise that the product can be recycled. If the product is not labelled and can not be recycled consumers will not try to recycle it and in turn help produce effective waste management as batches will not be spoiled by materials that are not recyclable. Coding also help recycler to identify material for recycling into different categories. Thus enable a more effective waste management system.*

*ii) Australia has many imported products. If the product displays a recognisable symbol then products can be quickly and efficiently recycled. Consumers have to be able to recognise the symbols this is why it is important for this coding to be globally accepted.*

*Also in Australian exported products, if they carry a symbol that is recognisable the product will be more excepted and better global recycling and waste management can be under taken.*

*By having a universal symbol it will encourage other nations to recycle and collaborate with our countries ie with imports and exports.*

### **Question 1: (d)**

Generally this question was quite poorly answered. Candidates failing to address the question of recyclability of the component materials within the product rather than just recycling materials.

#### **Good Candidates**

Specifically discussed components. Discussed and described a number of methods **and** gave examples. Including such features as; using recycling codes on components, designing replaceable components rather than discarding the entire product and/or DFD (Design for Disassembly).

#### **Average Candidates**

Identified components but a limited response in terms of methods that could be used.

#### **Poor Candidates**

Did not discuss components – discussion addressed the overall product and how it could be recycled. Looked at testing of materials to ensure they are recyclable.

The following is an example of one of the better candidate responses for Question 1: (d) (i).

*d) Component materials within a product can be recycled by labelling each part of a product (if it is made of a different material) with a different code. Products should also be made to be easy to dismantle (if possible) and materials that can be recycled should be used.*

*When designing the product emphasis should be made also on the material to be used and if it can be recycled. It should be designed in such a way to be able to be recycled.*

- *Use recycled plastics in the design*
- *make the outercase of a product into a lot of smaller pieces that can be replaced or thrown away to be recycled*
- *include a symbol on the product that say's the product can be recycled*
- *standerdise similar products so parts can be bought and used and broken parts can be recycled.*

### **Question 1: (e)**

Generally well answered. Candidates needed to concentrate on answering the question rather than just describing what they saw in the pictures.

#### **Good Candidates**

Clearly identified the concept and discussed how it conveys an environmental message.

#### **Average Candidates**

Identified the concept but demonstrated limited understanding of how it conveyed an environmental message.

#### **Poor Candidates**

Paraphrased the text presented under each plate. Presented a combined response for the three plates.

The following is an example of one of the better candidate responses for Question 1: (e) (i), (ii) and (iii).

e) *Figure 2 The visual appearance of the papers is the textures, they look a big rough, uneven and thus create a natural appearance suggesting that they have been recycled or created from natural materials.*

*The papers appear to be environmentally friendly. Made from natural materials and recycled Lokta from Nepal.*

*Figure 3 The garment looks natural due to the rough texture of the fabric and the patterns and the natural colour (tones). It's made from cotton. The cotton is home produced and spun and the garments are part of an aid program – all seem to be helping environment and people.*

*Figure 4 Sunracer makes full use of natural resources – sunlight and it creates no pollution like other cars by emitting petrol gases – lead etc. It is environmentally friendly in this way.*

**QUESTION 2 (8 Marks)**

**Marking scheme with suggested answers**

(a) Explain the term 'intellectual property'. 6 Marks

2 New or innovative idea or thought

2 Can be proven or controlled/protected/registered

1 Can be individual or group/company

1 Answer clarified with example (either with an actual example of a protected product/idea or using the terms trade mark, copyright, patent, etc)

(b) Kim was employed by a company. During this employment, Kim also worked at home at night on original ideas. Among these was an idea for a new application for one of the company's existing products. Kim registered the idea with the patents office. The company took Kim to court, saying that they were paying Kim's salary, therefore the intellectual rights to the idea belonged to the company.

Briefly explain how EACH of the following factors influenced the conflict between Kim and the company.

(i) ethics

(ii) employee skills

(iii) training and development of employees

(iv) working from home

(v) how ideas are generated

(vi) originality of design

(vii) protection of intellectual property

14 marks

In each case the factors (i – vii) needed to have a more detailed description or example **and** mention how this has influenced the conflict (possibly the other party's viewpoint).

i) ethics

- Moral principles or viewpoint
- Stealing ideas
- 'Right' or 'Wrong'
- Ownership

- ii) employee skills
  - Kim may have been employed for his/her skills
  - Who owns skills developed through T & D
  - Skills learned or developed in ‘own time’
  - Who ‘owns’ skills
- iii) training & development of employees
  - If the company pays for training do they control subsequent ideas
  - Can an employee take skills from one company to another
  - Is the only professional development of an individual ‘work related’
- iv) working from home
  - Is Kim paid a salary or a wage (ie. paid for out of hours work)
  - Who pays for overheads of the home office
  - Is it agreed that Kim will develop ideas for the company at home
- v) how ideas are generated
  - Planned work like approach (structured analysis)
  - Intuitive
  - When prompted or inspired by work peers
  - Catalysed by other influences (sights, experiences, sounds, etc)
- vi) originality of design
  - How different, new or innovative is it
  - Would legal protection or registration be issued
  - Is it a minor modification or an innovative change/development
- vii) protection of intellectual property
  - Patents, Trade marks, copyright, design office, etc
  - Does the company have existing protection which may apply
  - Can ownership or development of the idea be proven
  - Morals/Ethics

## Markers' Comments

- 2 (a) Most candidates were able to recognise that intellectual property would involve a new or innovative idea that could be protected. However better candidates were able to explain their answers in more depth and include examples.

Example of a good answer:

- a) *Intellectual property refers to any part of a design or product that may have innovative features and therefore should be protected so that other people cannot copy or steal the design.*

*Intellectual property comes in around four forms including:*

- *trademarks;*
- *designs;*
- *patents;*
- *products.*

*It is important that all intellectual property be protected. An example is copyright on books.*

- 2 (b) Candidates had difficulty analysing the conflict between Kim and the company. Many candidates simply questioned the authority of the company and made value judgements.
- i) **ethics:** Generally well answered. Most students could recognise 'rights' and 'wrongs' of the conflict.
- ii) **employee skills:** Generally well answered. However, some confusion was evident in relating this to the passage and to the conflict. Better answers acknowledged that companies cannot 'own' peoples skills to the extent that they cannot be used elsewhere.
- iii) **training and development of employees:** Most students acknowledged that company funded training and development may give the company some rights to skills acquired during such training. Some students acknowledged the right of the worker to personally and professionally develop and to 'own' and take with them the skills to other situations and employment. Ownership and control of the skills are important concepts in the conflict.
- iv) **working from home:** Generally well argued. Most students felt that ideas generated by Kim at home were her individual property and that the company had no rights to them. Few candidates mentioned that working from home may have been either a part of Kim's employment, or alternatively, just part of her own after hours interests.

- v) **how ideas are generated:** Some confusion was evident as to the relevance of this to the conflict. The better candidates recognised that ideas generation stems from more than training and development provided by the company. Other life experiences, teamwork, intuition, etc. can all contribute to ideas development as can a more structured problem solving approach.
- vi) **originality of design:** Most candidates recognised that conflict arose due to the use of an existing component in Kim's patent. Few discussed the importance of ideas and design originality or mentioned that the component used could vary in importance to the overall design depending upon its significance.
- vii) **protection of intellectual property:** This was generally well answered. Students demonstrated a good understanding of mechanisms to protect intellectual property, eg. patents, trademarks, copyright.

Example of a good answer:

- (a) *Intellectual property refers to any part of a design or product that may have innovative features and therefore should be protected so that other people cannot copy or steal the design.*

*Intellectual property comes in around four forms including:*

- *trademarks;*
- *designs;*
- *patents;*
- *products.*

*It is important that all intellectual property be protected. An example is copyright on books.*

- (b) i) *Ethics – The Company believes that Kim owes them for providing her with a job and they see this as a part of their ethics code or system.*  
*Kim does not have to give them the rights to use her idea at all.*
- (ii) *The company believes that they have helped in the development of Kim's skills so they are in part the owners to Kim's idea.*  
*Kim does not believe what the company is saying, it was her own idea developed through and by herself.*
- (iii) *The company believes that they have trained and developed Kim in her skills. They believe that through their involvement she was able to produce the idea.*
- (iv) *The company may have been involved in her training and development but she completed home study as well which also helped in her development.*

- (v) *If they had not been involved in extending her thoughts and ideas then maybe she would never have come up with the idea.*

*Yet it is through Kim's home study and practice that led her to the development of the idea. The company was the beginning building block for Kim.*

- (vi) *Using an existing product for the basis of her idea. If there had been no product then Kim may have not come up with the new application at all.*

- (vii) *The fact that Kim had her idea patented caused the conflict.*

*As we are aware intellectual property refers to an innovative part or feature of a product that can or should be protected.*

*Kim has protected her idea from being copied and the company does not like this because of all the factors that have been discussed above.*

### **QUESTION 3 (8 Marks)**

#### **Marking scheme with suggested answers**

- (a) Microchips, laser beams, and optical fibres are examples of recent innovations that have impacted on areas such as *sales and marketing, medicine, manufacturing, and communication.*

Explain how a recent innovation has impacted upon ONE of these areas.

Identify the area – Sales and marketing, medicine, manufacturing, communication (1 Mark)

Describe impact of the recent innovation:

- microchip – information storage, etc
- optical fibres – communication efficiency, etc
- laser beams – improved efficiency in surgical procedures, etc.

(3 Marks)

- (b) Australia has had many innovations that have met with success within Australia and overseas.

- (i) Identify and describe TWO successful Australian innovations, at least one of which has had success overseas.

- (ii) Propose and justify THREE reasons for the success of each of the two innovations you described in part (i).

- (iii) The use of resources has an important impact on the environment.

Analyse this statement with respect to the realization of the TWO innovations you described in part (i).

- (i) Identify 2 innovations – eg wine cask, black box flight recorder, Victa rotary lawn mower, bionic ear (2 Marks)
- Describe each innovation (4 Marks)
- (ii) Propose and justify 3 reasons for each one of the two innovations above eg. efficiency, improve effects on environment, communication, ease of use, production costs, safety manoeuvrability, market trends/niches. (6 Marks)
- (iii) Impact on the environment of the realisation of the product
- recyclability, pollution concerns, use of sustainable resources, human impact on the environment. (4 Marks)

### Markers' Comments

- (a) Most students identified an innovation and an area well.

They described the innovation but mainly omitted to describe the impact.

The poor answers did not define the area, some even wrote a description of each of the examples.

Some candidate's answers are listed below:

#### • *Sales and Marketing*

- Fax* – *orders, etc*
- Modem* – *E mail, Internet*
- Computers* – *stock control, direct sales ordering*
- Cable and satellite TV* – *contact with specific market sectors*

#### • *Medicine*

- Computers* – *storage of data related to patient ailments*
- *easy to research for comparable cases, etc*
- *E mail, contact other information sources*
- *use in CAT scans*
- *drug, blood analysis, spectrograph*
- Optical Fibres* – *arthroscope*
- *gastric research*

#### • *Manufacturing*

- Computers* – *CNC machines*

- CAD, CAM
- Inventory tracking
- Electron Microscope – materials analysis
- Ceramics – new die making and machining techniques
- Synthetic lubricants – friction reduction
- less down time

• **Communication**

- Optical fibres – smaller transmission cables
- more message capability
- Satellites – global communication instantly
- Cable TV – wider appeal for audience
- Fax – instant letters
- Modem – speed and flexibility, E mail, etc

(b)(i) Most students were able to identify innovations as Australian. The criterion of overseas success was insufficiently addressed.

Most students identified the innovations. Some did not describe the innovations sufficiently.

Candidates' answers included:

- *Rotary lawn mowers (Victa). Mower with blades attached to a plate which rotates in a perpendicular plane to the grass.*
- *Ralph Sarich Orbital Combustion process (direct fuel injection for 2 stroke engine).*
- *Both have had success. The orbital engine is now being developed by Ford and some outboard motor manufacturers.*

(b)(ii) There was a general difficulty in differentiating between 'propose' and 'justify'. Some students did not give three **different** reasons for the success of each innovation, described in part (i).

Candidates' answers included:

- **Rotary Lawn Mower**
  - cuts grass effectively
  - is rugged and low maintenance compared to cylinder mowers, blades don't have to be sharpened professionally

- *cheaper to construct than cylinder mowers.*
- ***Orbital Engine***
  - *more fuel efficient, injection measures fuel accurately*
  - *more power due to 2 stroke cycle*
  - *smaller motors can be used due to increased power output.*

(b)(iii) The word ‘realisation’ was often ignored or misinterpreted. Candidates analysed the impact of the final innovation on the environment. Comments on resources and the environment were very generalised in many cases. Mainly physical resources were considered.

Candidates’ answers included:

- ***Lawn Mower***

- Negative*
- *uses non renewable raw materials (unless recycled)*
  - *uses fossil fuels in manufacture and use*
  - *produces noise and air pollution in manufacture and use*
  - *produces grass clippings which are ineffectively utilised*

- Positive*
- *easy to use for mowing the lawn*
  - *clippings may be used for compost.*

***Orbital Engine***

- Positive*
- *less fuel used*
  - *less raw materials used in manufacture*
  - *smaller cars may be built saving space and traffic congestion in cities.*

- ***Dynamic Lifter***

(b) (i) *Description*

*Processed chicken manure in a dry pelletised form sold as a garden fertiliser.*

(ii) *Success*

- *Effective utilisation of chicken manure which otherwise was a polluting by-product of battery hen production*
- *Effective research and development programme during realisation of the product*
- *Effective marketing of the product.*

- (iii) – *Non chemical organic fertiliser*
- *No soil residues*
- *A proven better fertiliser to chemical competition.*

Overall the question was quite well answered, a wide variety of innovations were researched and well described.

**QUESTION 4 (8 Marks)**

**Marking scheme with suggested answers**

- (a) The Sydney Opera House, the rotary clothes-line, and sun-block creams are examples of innovative design.

Answer the following questions using *either* the above examples *or* others that you have studied.

- (i) Entrepreneurial activities are important for the success of innovative design. Analyse this statement.

Definition:

Entrepreneur – someone who organises and manages any business undertaking, especially one with **risk**.

Innovative – to bring in something new, renewed, altered.

Definition of entrepreneurial activity 1 Mark

1/2 each for at least 2 examples 1 Mark

Analysis of each example: why is entrepreneurial activity important 4 Marks

**Total  
6 Marks**

- (a) (ii) Government, commercial, and industrial agencies can affect entrepreneurial activities and the implementation of innovation in design and in technology.

Identify and explain THREE possible effects that may occur.

Answer in terms of question ie. use examples, look for positive and negative effects, relating to:

Business Name; Licences; Packaging and Labelling; trading hours; taxation; Partnership Act; Companies Code; Stock Exchange; Patents Office; National Companies and Securities Commission; Corporate Affairs; Industrial Relations; Planning and Environment; EPA; CSIRO; research grants; Consumer Affairs; etc.

Must identify 3 separate and possible EFFECTS (2 each)

**Total  
12 Marks**

- (b) A company is planning to market a product in Australia. It needs to consider the relationship between market size and demand. Critically analyse this relationship. Use THREE examples to explain your answer.

Overview of relationship between market size and demand 2 Marks

2 each analysis of 3 examples 6 Marks

**Total  
8 Marks**

**Markers' Comments**

**Question 4**

**Part (a) i)**

- |                 |   |
|-----------------|---|
| Many Candidates | <ul style="list-style-type: none"> <li>– found the wording of the question confusing</li> <li>– failed to interpret the need to identify more than one example</li> <li>– had difficulty linking entrepreneurial activity to success</li> <li>– used examples that were not innovations</li> <li>– needed to be more specific about the types of activities involved to support and develop innovation</li> </ul> |
| Good Answer     | <ul style="list-style-type: none"> <li>– identified and analysed the importance of entrepreneurial activity to a few examples</li> <li>– defined entrepreneurial activity well by mentioning not only financial risk but also management, organising and promotion of the innovation as part of the activity</li> </ul>   |
| Average Answer  | <ul style="list-style-type: none"> <li>– identified one example</li> <li>– defined entrepreneurial activity only as a financial risk</li> </ul>   |
| Poor Answer     | <ul style="list-style-type: none"> <li>– gave no examples</li> <li>– gave a poor or no definition.</li> </ul>   |

**Part (a) ii)**

- Many Candidates
- had difficulty identifying three different effects, either positive or negative, and relating them to entrepreneurial activities
  - gave at least some examples, few gave three good clear explanations
  - needed to relate answer to the above or other examples
  - did not identify actual agencies
  - gave answers that were very general or not specific enough
- Good Answer
- identified more than one agency
  - identified three effects and related to examples
- Average Answer
- identified one agency and only one effect
  - poorly related effect to innovation
- Poor Answer
- was not specific, just rewrote question

**Part (b)**

- Many Candidates
- responded well
  - gave a sensible overview
  - seemed confused by the need for numerous examples
  - explained using only one example, occasionally two, rarely three
  - did not give relevant examples
  - rewrote question without showing an understanding of the relationship between market size and demand
  - stopped mid sentence; ran out of time!
- Good Answer
- defined and related market size and demand
  - gave three relevant examples
- Average Answer
- defined but did not relate market size to demand
  - only gave one or two relevant examples
- Poor Answer
- did not define nor relate market size and demand well
  - rewrote question without being specific.