VCE 2000

VICTORIAN CURRICULUM AND ASSESSMENT AUTHORITY

Report for Teachers

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VCE REPORT FOR TEACHERS 2000

Technology

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Agricultural and Horticultural Studies GA 3: Written examination

GENERAL COMMENTS

Areas of strength and weakness

The ability to analyse agricultural and horticultural management problems using basic sustainability concepts requires improvement. In preparing students for the examination, emphasis needs to be placed on the skills required to analyse a situation by collecting and interpreting information in a systematic manner. The ability to analyse and discuss real and topical issues should be developed further through school-based activities which show students how to use environmental indicators to guide management decisions. This could be done by developing simple models or paradigms with students to guide their analysis of any agricultural or horticultural ecosystem. Students are expected to have developed specific knowledge across a range of common agricultural and horticultural situations.

Choice of articles for Questions 11 and 12

Students could choose between information relating to a range of different areas of Agriculture and Horticulture in Questions 11 and 12, and all articles were used. Students seemed to be quite selective, often choosing different areas for each question. The range of choice did not confuse the students.

Formula answers

The examination was structured differently from previous years, but almost identical to the sample questions published at the start of 2000, and students seemed well prepared for the exam. In preparing students it is necessary to look at examination criteria and apply these to a range of land and plant management situations that may be found in agricultural and horticultural enterprises throughout Victoria. In general students were familiar with specific aspects of the more common agricultural and horticultural enterprises. The current Study Design and examination criteria ensure that this will continue to be important. To do well students should have studied common agricultural and horticultural enterprises.

SPECIFIC INFORMATION

Question 1

a.

One mark was awarded for each valid climate modification, for example glasshouse, shelterbelts, irrigation and black plastic ground cover.

b.

Each description needed to show a basic understanding of what the modification was or did (1 mark) and how this altered production (1 mark).

Two-thirds of the students could list more than two examples of climate modification but only one third could demonstrate an understanding of the modification and how it altered production. Only about 10% of students described the modification in terms of how it changed a specific environment then linked this to the expected variation in production. Students are expected to understand how management practices impact on production.

Question 2

a.

One mark was given for each different type of erosion mentioned.

b.

The description needed to clearly show that the student knew what the strategy was and how it worked to prevent erosion (2 marks) – if understanding was not obvious, but some knowledge was shown (1 mark).

Students showed a good understanding of erosion. Eighty per cent of students could name two types of erosion and most could describe how to prevent it, although a number of students confused prevention and treatment.

Question 3

A description which showed clearly that the student knew the techniques of improving productivity of land affected by water logging received 2 marks – if understanding was not obvious, but some knowledge was shown (1 mark).

Most students are well versed in the use of trees to influence ground water levels and this showed in student responses (and the later answers to questions on salinity). Fewer than 17% took an

analytical approach by looking at the basic components of water logging: stopping water flowing into the area, using the water at the site and increasing the flow of water from the area. Students should practice analysing management problems from the basic causes and look for many varied solutions to each cause. It was encouraging that some students took the opportunistic view of water logging and considered how to turn it into a productive opportunity, such as growing water plants to increase production (this was accepted as a valid answer).

Question 4

a.

One mark was given for each microbial disease listed. Human diseases were not accepted. (No marks for non-microbial.)

b.

Correct description of why they are a problem (1 mark) how to prevent them (1 mark) and how to control them (1 mark). (No marks given for non-microbial diseases.)

c.

A full and accurate description of a valid 'thing' to monitor gained 2 marks – if the description was poor then 1 mark (no marks given for non-microbial diseases).

An interesting range of microbial and non-microbial diseases was listed. Only microbial diseases were accepted. Given that the specific nature of this question is a result of new content in the Study Design this question was well answered. 53% of students listed two or more microbial diseases and 35% could then explain something about at least one of the diseases. Students were very unsure of the difference between control and prevention and this should be emphasised when looking at management strategies. The concept of environmental monitoring related to disease was not understood. Only 10% of students were able to suggest a valid monitor. Students should be able to answer this type of question (a., b. and c.) for common disease types found in agricultural and horticultural enterprises.

Question 5

a.

The answer needed to clearly show how the organisations helped manage sustainability (2 marks) – if the example given was too general, unclear, or not linked to sustainability (1 mark). The specific organisation needed to be named.

Generally well answered with about 50% of students naming two organisations and describing aspects of the work they do to improve enterprise sustainability. In contrast, close to 20% of students could not name and describe an appropriate organisation. Key knowledge listed under Unit 4, Outcome 2 in the Study Design includes major organisations (external agencies) in the community that work with farmers and horticulturists to improve enterprise sustainability.

Question 6

a.

One mark was given for each valid environmental indicator.

b.

Marks were given if it was clear the student knew what the indicator was (1 mark) and how it relates to sustainability (1 mark).

Students were not familiar with a range of environmental indicators. About a quarter of students could name at least two indicators and a third could not name one. The Study Design gives examples of a range of environmental indicators on pages 38 and 39. Students need to practice evaluating the environmental health of enterprises, explain suitable indicators and what they measure.

Question 7

- Economic viability: unless generating income, a sustainable enterprise cannot survive long term.
- Minimal use of energy and resources: non-renewable resources need to be conserved for the long life of an enterprise and a shared future.
- Sustained indefinitely: an enterprise is not sustainable if it does not keep going.
- Without degrading soil, water, air or genetic resources: an enterprise must not reduce the sustainability of other enterprises, present or future by degrading basic resources.

Definitions of sustainability are many and varied in the community. Geographers seem to have a far broader yet more precisely defined approach than most agriculturists and horticulturists. The definition provided in the exam was somewhere between the two. Teachers should discuss a range of concepts of sustainability that exist and reach an agreed definition. If students demonstrated some understanding that enterprise sustainability includes impact on other systems and enterprises now and in the future they received higher marks. About 11% of students mentioned one or both of these aspects to receive greater than half marks for the question. About a quarter of the students could not relate any of the points mentioned to sustainability.

Question 8

The answer required that a business plan should show the relationship between past and future performance in regard to the areas of finance, marketing and production (1 mark). One mark was awarded for correctly listing a type of information needed to develop a business plan.

All students should have been involved in producing a business plan. This question provided an opportunity for them to use that experience. Sixty per cent were able to list two types of information needed to develop a business plan and about 25% could offer some explanation of at least one of these. Students were expected to demonstrate that business plans link past performance to plans for the future. It was encouraging to see that many students realised that business plans are more than just production plans; economic and marketing aspects also need to be considered.

Question 9

a.

The answer needed to include concepts of recharge, discharge, water table rising, saline build up due to evaporation as reasons for the occurrence of dry-land salinity (1 mark for each).

b.

The strategy described to reduce the salinity problem needed to be clearly linked to reducing the water table height (1 mark) and sowing salt tolerant species in the shorter term (1 mark).

c.

To monitor salinity students needed to explain any two of the following:

- visually monitoring plant life present
- monitoring of salt levels in the ground water and soil
- monitoring water table levels.

Seventy-five per cent of students understood one or more factors influencing salinity, but only about 12% could describe in detail how it occurs. Methods of reducing salinity were generally well known (many students suggested tree planting to solve any problem).

Question 10

a.
The list of market related information needed to refer to the product range and quantities, pricing, promotion, distribution and proposed market or the competition (1 mark given per valid point).

b.
Increased biodiversity, for example birds, leads to better pest control. Plants suited to the environment have more reliable and predictable growth. One mark was given for mentioning each benefit and 1 mark for an explanation that showed the student understood how the benefit comes about.

c.
Four possible answers could have been selected from: water quantity/irrigation system, drainage, water quality/nutrient run off, seed sources/local seed supply quantity/not indigenous for all farmers.

d.
A valid sustainable solution (2 marks) needed to be provided (valid, not sustainable solution gained 1 mark).

Answers to case study questions needed to relate to the information provided. Marketing aspects were adequately answered although 15% of students could not address these aspects. The benefits of growing indigenous plants were not well known. Perhaps students did not read the question carefully or did not know what indigenous means. Forty per cent of students were not able to list a benefit of growing indigenous plants. A small number of students listed two benefits with some explanation. In part c. hints to the problems were included in the case study information but students generally ignored these and suggested aspects that could become problems in any situation. Twenty-five per cent listed three or more appropriate problems and 20% listed none. Part d. was challenging, as it required a great deal of thought. Twenty-three per cent of students were able to provide valid sustainable solutions to two or more problems.

Questions 11 and 12

These two questions presented the students with a choice between seven alternative articles that described a new or alternative practice or type of machinery. Each of the articles stated what new and old technology was and included some of the advantages or disadvantages. The presentation of this information may have distracted some students from thinking in more depth about the technology and applying the knowledge they had about the enterprises/practices.

Question 11 Marking scheme

a.
The description needed to show a clear understanding of major differences between the old and the new technology (2 marks). A description of some but not all the major differences gained 1 mark.

b.
The major impact of the technology needed to be clearly explained (2 marks). If a poor explanation or peripheral impacts were mentioned students gained 1 mark.

c.
For each advantage/disadvantage: What and why explained (2 marks). Listing without an explanation, or a poor explanation (1 mark).

In part a. 43% of students got full marks for the question. Parts b. and c. required more thought and more information to achieve higher grades. Only 20% gained better than half marks. Parts b. and c. required explanation, not just a listing of the impacts, advantages and disadvantages.

Question 12 Marking scheme

a.
One mark was given for each relevant item listed. The listed equipment must be required for implementation as distinct from the general equipment a farm or horticultural enterprise may use.

b.
A clear explanation of how the machinery/equipment improves efficiency gained 2 marks. A poor explanation of what it does without being related to efficiency was given 1 mark.

Part a. was very well answered. Students received no marks for listing equipment that was not required to 'implement' the new technology. Two-thirds of the students gained half marks for part b. Many students only described what the equipment does without providing a clear explanation of how it improves efficiency.

Nursery production – Ebb and Flow Hydroponics Systems

Question 11

a.
How water is applied gained 1 mark. What happens to run-off gained 1 mark.

b.
The technology enables chemicals to be applied without risk of pollution and allows more precise control of fertiliser applications. Water usage will be reduced so there will be more for other uses. Root disease may need closer monitoring due to altered root environment. Leaf damage and disease will be reduced due to no water in the canopy. Increased humidity for longer periods may foster some fungal or bacterial disease in the leaves. There will be fewer problems with algae and slime on the floor of glasshouse.

c.
Advantages of the new technology: saves water and nutrients, lower running cost, less plant disease and damage from sprinkler splash and cleaner glasshouse environment.
Disadvantages: more expensive to install, increase root disease risk, salts in the media may become a problem due to evaporation, lifting of pots over the lip of the bench. (One mark for mentioning and 1 mark for explaining each.)

Question 12

a.
Items of machinery or equipment required to implement the approach are: the benches, pumps, holding tanks, soil moisture sensor and device to monitor salts in solution.

b.
Soil moisture sensor shows when the plants have been in the nutrient solution for long enough thus saving water, keeping plants disease free and healthier. Holding tanks collect and store waste for recycling. Money is saved by reducing running costs.

(One mark for an explanation that addressed what the equipment does, 2 marks if it addressed efficiency.)

Horticultural crops – Reducing plant moisture loss

Question 11

a.
The new technology reduces the need for watering plants under various stressful situations. It stops moisture loss rather than replaces it.

b.
Reduced need to protect sensitive crops. Allows various practices to be done in a broader range of weather conditions. Weather will not be as critical.

c.
Advantages of the new technology: reduced water use, more flexible management with regard to sowing times, more plants survive transplant, protection against frost damage and quicker growth to market stage due to less stress.
Disadvantages: additional cost, and addition of another chemical spraying to crop cycle. (One mark for mentioning and 1 mark for explaining each.)

Question 12

a.
Items of machinery or equipment required to implement the approach are: spray unit, measuring flasks for mixing the chemical, mixing tanks, protective clothing, monitoring devices for growing conditions and a way to monitor weather.

b.
Monitoring devices allow the farmer to only apply the substance when it is needed, thus lowering costs. Spray unit allows the chemical to be sprayed onto the plants at the appropriate concentrations ensuring little wastage. (One mark for an explanation that is valid, 2 marks if it addressed efficiency.)

Pest control – Integrated pest management

Question 11

a.
IPM monitors the pest populations and spraying is done when critical counts are reached. The traditional approach is to spray on specific calendar days regardless of pest levels.

b.
Farmers or horticulturists spend time monitoring and understanding the pest cycle and identify critical times for treatment. They will respond to the evidence of pest build up rather than the calendar. This should mean fewer sprays and less build up of resistance in the pests, causing less cost to the industry.

c.
Advantages of the new technology: fewer sprays, less cost, wider market for product, less resistance to chemicals.
Disadvantage: continual monitoring required, knowledge of pest lifecycle required, crop might not be as 'perfect'. (One mark for mentioning and 1 mark for explaining each.)

Question 12

a.
Items of machinery or equipment required to implement the approach are: spray equipment, safety clothing, pest traps (monitoring equipment), record books, measuring containers for mixing chemicals and weather monitoring equipment.

b.
Spray equipment ensures that the spray chemicals are applied at the correct ration allowing optimum pest control/cost. Pest traps allow measurement of pest populations and guide the most effective time to spray. (One mark for an explanation that is valid, 2 marks if it addressed efficiency.)

Soil cultivation – Ploughing method to combat erosion

Question 11

a.
Ploughs are used to turn over the sod. This plough removes the trash on the surface and mixes it with the topsoil.

b.
The technology helps farmers and horticulturists to protect their soil from erosion and focus on building healthy topsoil by careful management of the plant litter in the ploughing process.

c.
Advantages: increases biomatter in the topsoil, protects soil from erosion, creates less dust, maintains soil structure.
Disadvantages: expensive, weed and disease carry over. (One mark for mentioning and 1 mark for explaining each.)

Question 12

a.
Items of machinery or equipment required to implement the approach are: plough, tractor, spray unit, protective clothing, measuring containers.

b.
Plough removes weeds and crop litter, prepares for next crop in a timely manner. Tractor allows the fast coverage of land when best suited to the weather. (One mark for an explanation that is valid, 2 marks if it addressed efficiency.)

Cropping – Raised beds improve cropping

Question 11

a.
Crops are planted in wide raised beds compared with the traditional level broad acre approach.

b.
It will enable production of crops in winter or wet areas that would not normally be possible, as it stops their roots from being water logged. It also is more fuel-efficient and reduces soil compaction.

c.
Advantages of the new technology: allows planting in wet areas, winter crops, reduces soil compaction and some machinery running costs, improves water retention and reduces erosion.
Disadvantages: forming beds adds extra costs and requires special equipment. (One mark for mentioning and 1 mark for explaining each.)

Question 12

a.
Items of machinery or equipment required to implement the approach are: tractor, bed forming ploughs, surveying equipment, compaction testing equipment, seeders and harvesters.

b.
Surveying equipment makes the contours slope the right way and ensures run-off is correct. Compaction testing equipment ensures that the beds are formed properly, tells when it is best to plant and that the drainage furrow is monitored for compaction. (One mark

for an explanation that is valid, 2 marks if it addressed efficiency.)

Cropping and grazing – Precision farming

Question 11

a.
Old technology applies the same amount of seed and fertiliser to all areas in each paddock. The new technology allows the application rate to be varied according to the capability of each small area of land.

b.
Farmers will start to think more precisely about their land use capabilities and treat the land accordingly. The resources will be applied more cost effectively.

c.
Advantages of the new technology: efficient application of seed and fertiliser and land is carefully managed.
Disadvantages: costly, technology still being refined, time consuming, and requires a lot of records to be collected over time. (One mark for mentioning and 1 for explaining each.)

Question 12

a.
Items of machinery or equipment required to implement the approach are: GPS, computer, special controls on seeding equipment and tractor.

b.
GPS allows precise location of each area of land allowing identification of capability; computer allows integration of records and control of machinery according to location. (One mark for an explanation that is valid, 2 marks if it addressed efficiency.)

Dairy farming – Modern milking

Question 11

a.
The computer controlled rotating dairy replaces walk-in/walk-out manual controlled dairy.

b.
Each animal is treated as an individual automatically, allowing feed and milking protocols to be matched to potential, and automation to save labour cost, and time. Better individual animal production records can be kept.

c.
Advantages of the new technology: saves time, accuracy of feed delivery and record keeping, optimises each cow's production.
Disadvantages: costly, must be used on a large farm to be justified, automation can take the personal approach and knowledge out of the operation. (One mark for mentioning and 1 mark for explaining each.)

Question 12

a.
Items of machinery or equipment required to implement the approach are: rotary dairy, computer, feed auger, cleaning equipment and silo.

b.
Feed auger: saves time in feed handling. Silo: allows clean storage of feed, no waste. (One mark for an explanation that is valid, 2 marks if it addressed efficiency.)

Stock feeding – Processing grain proves a viable alternative

Question 11

a.
Grain is crushed partially instead of being fed whole.

b.
The new technology will make more work but increases production due to higher feed conversion ratios. Ability to add vitamin and mineral supplements is enhanced. Farmers may have fewer local environmental problems due to odour reduction. There is a possibility of shorter holding time for animals as growth rates may be quicker. Animals can be sold in less time.

c.
Advantages of the new technology: increased feed conversion, less smell.
Disadvantages: bulkier, more costly, does not keep as well (One mark for mentioning and 1 mark for explaining each.)

Question 12

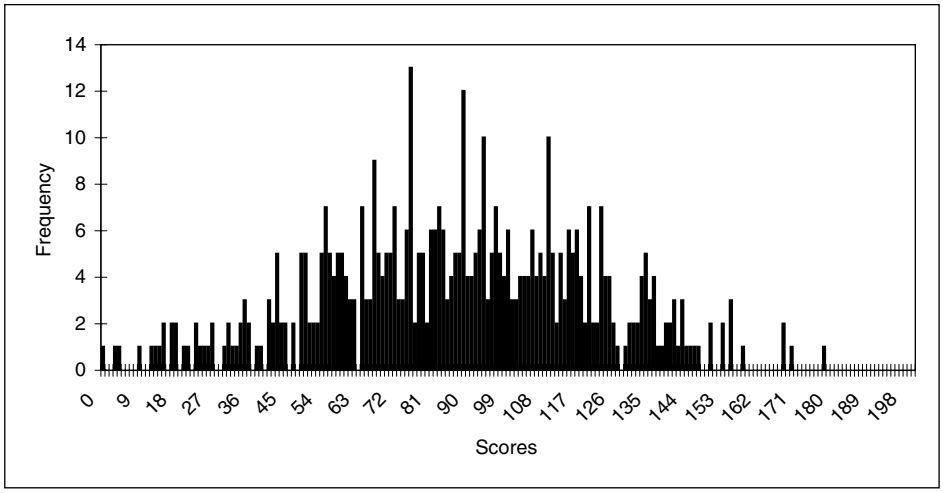
a.
Items of machinery or equipment required to implement the approach are: silo, auger, feed crushers and rollers and trucks.

b.
Crusher increases the digestibility of the grain, silo allows for clean food storage, less waste and easy access (One mark for an explanation that is valid, 2 marks if it addressed efficiency.)

GA AH033 AGRICULTURAL AND HORTICULTURAL STUDIES WRITTEN EXAMINATION

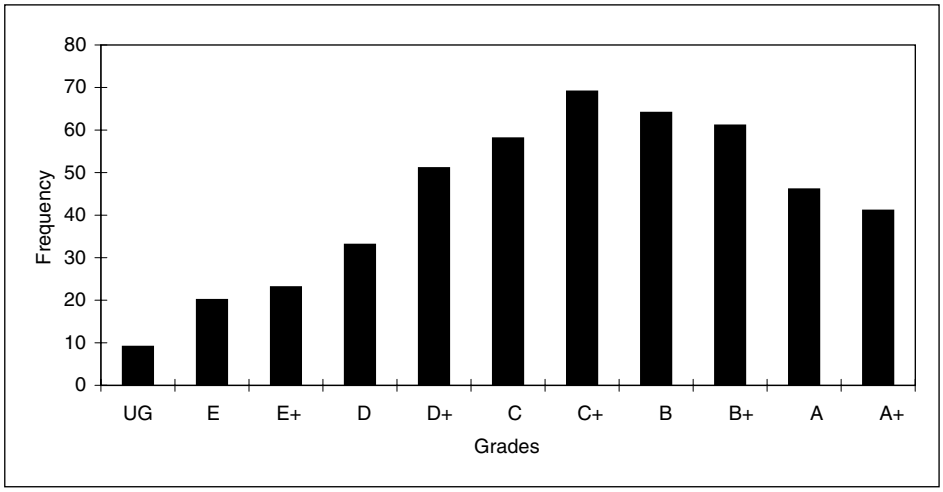
HISTOGRAM OF TOTAL SCORES 2000

Count 475 Mean 87.34 Standard Deviation 32.90 NA Result 80



HISTOGRAM OF TOTAL GRADES 2000

Count 475 Mean 5.96 Standard Deviation 2.57 NA Result 80



ENROLMENTS		%
Female	169	30.5
Male	386	69.5
Total	555	

GLOSSARY OF TERMS

Count Number of students undertaking the assessment. This excludes those for whom NA was the result.

Mean This is the 'average' score; that is all scores totalled then divided by the 'Count'.

Standard Deviation This is a measure of how widely values are dispersed from the average value (the mean).

Information Processing and Management GA 3: Written examination

GENERAL COMMENTS

The Information Processing and Management examination for 2000 marked the introduction of a new examination format. The paper consisted of fourteen separate questions. The advantage of this approach is that students who did not understand the details of a particular scenario within a question were still able to score well on the rest of the paper.

The spread of students' scores was wide, with the lower scores pertaining to students who either did not address a question or failed to relate their answer to the stimulus material in a question. The greatest spread of scores occurred on Questions 10–14, where students were required to explain or justify their answers. Many students provided very short answers and were unable to acknowledge in their answers, the circumstances of the scenario in the questions.

Teachers had obviously prepared students well in relation to the Internet and web publishing as Question 4 was extremely well done. Very few students obtained less than 3 marks out of 4 for their answers. On the other hand many students incorrectly made the assumption that if software questions were asked, such as Question 3, then the two software tools that they had studied had to be used in the answers. Students at this level are expected to have a general understanding of the purposes of the more common software tools.

Generally, students should be urged to write longer responses when asked in a question to 'explain' or 'justify'. Many students did not provide enough detail to obtain full marks. For example, students would be expected to provide more than a one-sentence response to a question worth 4 marks that warranted an explanation or justification.

Most students coped well with the choices offered in the paper and selected the appropriate number of parts to answer. However, a small number of students answered all parts of optional questions.

SPECIFIC INFORMATION

Responses to all parts of a question are provided, even if the students were required to select an appropriate number of parts. The answers provided are not exhaustive, and they reflect the expected responses or more common ones provided by students.

Question 1

From the provided list of three roles, the expected responses were:

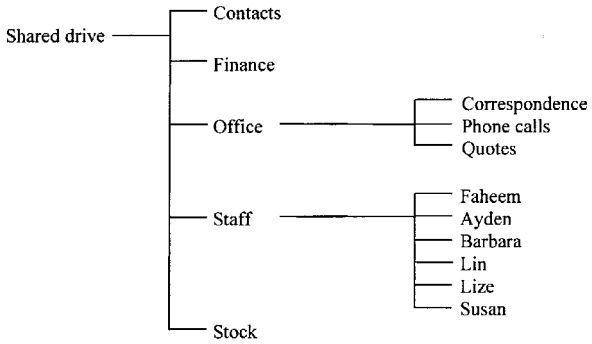
Position	Role
operational managers	*implementation plans*
senior management	*long-term planning*

Many students only scored 1 mark as they did not pick up that a manager's role is planning, and incorrectly selected 'daily tasks' for the operational manager's role.

Question 2

a.

Students found this question challenging and frequently attempted to draw an organisation chart. This type of response was not awarded any marks. An acceptable response was:



b.

Naming convention

Any convention that was suitably able to differentiate the letters was accepted such as recipient name and date. Some students confused naming convention with formatting conventions for letters and subsequently suggested the convention of 'full block letter'.

Question 3

Acceptable responses are provided for each case study (students were only required to answer two case studies).

Case study A

Software tool: *desktop publishing (DTP), word processing (WP) or specific package name, for example Microsoft Word.*

Reason: Notification of a meeting would typically be in the format of either:

- a flyer (done most effectively using DTP) with text and images
- a letter (done most effectively using WP) applying the mail merge facility.

If students nominated database software they only scored marks if they explained how the database was used to merge with a letter or a report. Email and web packages were not awarded marks since not everyone has Internet access.

Case study B

Software tool: *project management, database or spreadsheet (used as a database/or Gantt chart) or specific package name, for example Microsoft Project or Inspiration.*

Reason: The coordinators need to create lists of people, which is done most efficiently using a database.

Since a timeline for completing tasks is needed, project management tools allow both the tasks to be listed and a timeline to be identified.

Other answers were accepted where the student was able to clearly explain how the software produced a planning document.

Case study C

Software tool: s*preadsheet or database or finance/accounting packages.*

Reason: Automatic recalculation when figures are changed calculations are executed when different rates are entered.

Question 4

This question was extremely well answered by students. Clearly the choices made this question accessible for all students and the subject matter had been well covered by all teachers. Students obtained full marks if suitable explanations were provided; however, if a generic answer such as efficiency or effectiveness was provided, then no mark was allocated.

Consistent placement of navigation buttons

- ease of use for visitors to the site
- people can quickly locate the button to go to a preferred page from anywhere.

Graphics 30k

- page loads in an acceptable time (quickly)
- users not waiting a long time to view page.

Videos selectable option

- large files take too long to load
- not all users will want to see the video.

Size of file is given for downloading

- user knows how much space is required
- user is able to estimate time for download.

Page to fit 800 x 600 resolution

- user not required to scroll
- quality of presentation maintained
- most monitors have 800 x 600 resolution or higher.

Underlining is NOT used

- underlining is for hyperlinks (convention)
- user could be confused when underlined text does not go anywhere.

Question 5

While this question was generally well handled two aspects do need to be considered. Firstly a small number of students confused the words software and hardware and secondly a minority of students were unable to adequately explain the function of the item, preferring instead to describe the hardware.

Software:

- browser (Netscape Communicator, Internet Explorer)
- dial-up software, modem software, TCP/IP software
- operating system (Windows).

Hardware:

- modem to convert digital signals to analog and vice versa that enable messages to travel over the phone network
- cable/telephone line that enables packets to pass between connected computers
- any other items that are used for which the student provided a clear explanation such as monitor, computer or even a phone jack as it allows information to pass through the telephone cable.

Question 6

This question was misinterpreted by a large number of students who believed it meant backup. Clearly backup procedures have been very thoroughly covered by teachers, and students came up with very sound strategies. However, no marks were awarded for this response. Similarly very few students related their answer to a software tool as indicated in the question. An acceptable response was:

Method: *Print Preview (Preview in browser, page layout view).* Students were expected to relate the method to particular software such as using Datasheet view in Microsoft Access.

Purpose:

- check that output fits within specified margins
- check that output is visually balanced
- check that appearance is correct before printing to paper.

As very few students gave the expected response, marks were also awarded for correct definitions of soft copy.

Question 7

In general, this question was well handled by students. Errors occurred, however, when students explained how encryption works rather than stating its purpose or assuming that every file is encrypted. An acceptable response was:

Purpose:

- to protect data (from theft)
- to restrict access to data files (from unauthorised users).

Example: Marks were awarded for **specific** (not generic) answers such as

- sending credit card details over the Internet
- emailing confidential files (internally or externally).

Question 8

In general, students either knew these phrases or they did not and in some instances there were misinterpretations, particularly with respect to depersonalisation and deskilling. Some students believed that depersonalisation was a private service now being available to everyone and deskilling related to desks. Acceptable responses were:

Depersonalisation of services

- less face to face interaction
- more electronic services provided.

Deskilling of workers

- less knowledge and/or skill required by workers to perform job.

Project was completed on time and within budget

- task was completed on or before the due date (End date) and did not spend/exceed estimated costs (to obtain the mark for this phrase students had to address both time and costs).

Question 9

Students obviously found this question difficult, including part d., which did not relate to the diagram provided at the start of the question. Students in general did not seem familiar with the term 'milestone' and commonly assumed that the first task to be done was a milestone. Note that a range of different responses was accepted for part c. due to the number of common misinterpretations of the term 'end date'.

a. sign contract (correct answer) or 30/11

b. 3 days (no mark for 1 day as the question says including weekends)

c.
- 1 day
- cabling will now start on Tuesday 19th not Monday 18th but project is still able to be completed on time **or** nothing **or** end date will be delayed by one day **or** end date will still be met.

d.
- employ more staff
- work 24 hours
- reduce testing time.

Question 10

The presentation of this question in two parts (one of identifying the weaknesses and one of discussing the implications) was not handled well by students. Many students gave solutions instead of implications and solutions were not awarded marks. This question effectively discriminated between students' performances as many students only identified one weakness and gave only very brief implications. Students must read the stem of a question carefully to ensure they answer what is being asked. Acceptable responses were:

a.

- public viewable nature of printed list
- no protection of the computer file indicated
- no identity check when password given out.

b.

Implications included:

- user accounts not adequately protected
- unauthorised users can access, change, delete files
- no process in place to check/validate password requests
- people can change passwords and lock others out.

Question 11

While many students were able to answer parts of this question successfully and the choice assisted this process, the most common misinterpretation was to treat it as a problem-solving process and to answer in terms of creating a software solution as had been done in the school assessed coursework. This interpretation was not awarded any marks. Acceptable responses were:

Analysis

- system studied and specification developed to describe what new system has to do
- looks at organisational goals and how system needs to be adapted to meet them (i.e. identify problem)
- develops proposals for change, conducts feasibility study to determine if current system needs alterations.

Design

- develop physical/logical designs
- documents input/output of new system
- develop data flow diagrams and layouts.

Implementation

- changeover from old to new system
- install/test new system and train users
- convert to new system.

Evaluation

- conduct post implementation review
- identify errors and enhancements
- monitor system performance.

Question 12

Expected responses were:

a.

i. Step – Validation

ii. Step – Delivery docket printed or data stored in file

Reason:

- you need to save the data first to ensure data integrity
- data should not be printed until all the data is checked and stored.

In part ii. 'Click on finish' and 'Confirmation of request sent to user' were awarded marks if it was clearly evident in the reason that the student had misinterpreted the word 'finish' to mean end or the word 'confirmation' to mean validation.

b.

Students commonly misread this question to mean the documentation the company would give to the consumer or the output of the system rather than the documentation the developers would provide for operating the system. Answers such as a receipt or an invoice were not awarded marks. The expected response was:

User Guide (Quick Reference)	*Customer*
Troubleshooting Guide	*Sales Staff/Staff*
Reference Manual	*Support Staff/Staff*

Many students did not fully answer the question, as they did not provide the audience of the documentation, which was required to gain marks. Matching the documentation to the user was required to gain a mark.

Question 13

a.

Most students were able to identify two reasons and a justification for each. Acceptable responses were:

- cost savings/efficiency – there is no need to print and circulate paper forms so school costs are minimised and no lost forms need to be replaced
- ease of access/more convenient – forms can be filled in at any time prior to submission date and sent to coordinator regardless of absenteeism
- less effort/efficiency – online submission means it is not necessary to find the coordinator to ensure it is recorded when submitted.

b.

Students were given a choice and while most used it effectively, a small number of students attempted to answer both aspects without providing sufficient detail. Some acceptable responses were:

USER	• Student • Parents	• Staff/teachers • VCE Coordinator
DATA SECURITY	• less risk of forms being lost • need password entry to system/form to ensure authorised user	• access to file needs to be limited to ensure no changes to data made accidentally or file left on a shared network machine • data transmission method needs to be secure
TRAINING	• need to instruct how to make selections and lodge form	• need training on how to check which students have not submitted forms • how to import/transfer data to timetabling package • training in backup • training in how to correct errors

c.

Most students selected the first option. Questionnaires and interviews were commonly given as an effectiveness strategy but were not awarded marks if it was apparent that the students were only using different terms for a survey. The answer needed to indicate that the strategy would allow for any of the following information to be gathered:

- number of changes requested by students
- number of students submitting forms by the due date
- number of errors needing to be fixed.

Students were then required to compare the results to the previous system. If students chose the second option, the acceptable response was to suggest that a meeting be called of the students to explain the reasons for changing the system and outlining the benefits to them. The procedures could be demonstrated. A simple set of instructions could be developed and students could be assisted when completing a sample form. Instructions for completing forms should be given to students.

Question 14

a.

Goal statement

It was expected that students would do more than simply copy out a phrase from the question and those who did were not awarded the mark. Goal statements about making a profit were also not awarded marks. A sample goal statement that was accepted was 'Do Good For Others aims to provide the most appropriate second hand goods to its customers as rapidly as possible'.

b.

Health and safety issues

In general, students were able to clearly identify two health and safety issues but could not always relate these to the case study (the retired volunteer workers). A common error was to interpret safety as security, with a small number of students then talking about security alarms and security cameras.

Eye strain

Many elderly people need different glasses for reading and print on screen could cause strain over time.

Lighting/reflection

Elderly staff may have difficulty reading the screen if the lighting or reflection is inappropriate and strain with bad posture to read material off screen.

Muscular aches and pains

If the equipment is not located appropriately then elderly people will be more susceptible to developing muscular problems with constant use of the equipment.

Stress

Many elderly people have not used computers or use them infrequently and are afraid that they will do something wrong adding to their stress when using the equipment that can lead to other health problems or to increasing any already existing muscular problems.

c.

Most students could identify two issues but had difficulty in analysing them. The analysis was often very brief but most students did relate it to the case study – especially the costs for a non-profit organisation. Issues that were commonly raised included:

- Cost
  - Can the organisation afford the outlay to install networked computers? It is a charity.
  - What will it cost to redesign the layout of a store to ensure the computer is appropriately located with phone and power connections?
- Technical expertise
  - Does the organisation have anyone with technical expertise to keep the network running?
  - Will the organisation be able to service the needs of its country stores?
- Staff skills
  - How will the volunteers (large numbers) be trained to operate the system?
  - How will new volunteers be brought up to the necessary skill level after the initial training?
  - Who will fix any minor difficulties that occur?

d.

The acceptable answer was:

- six months

e.

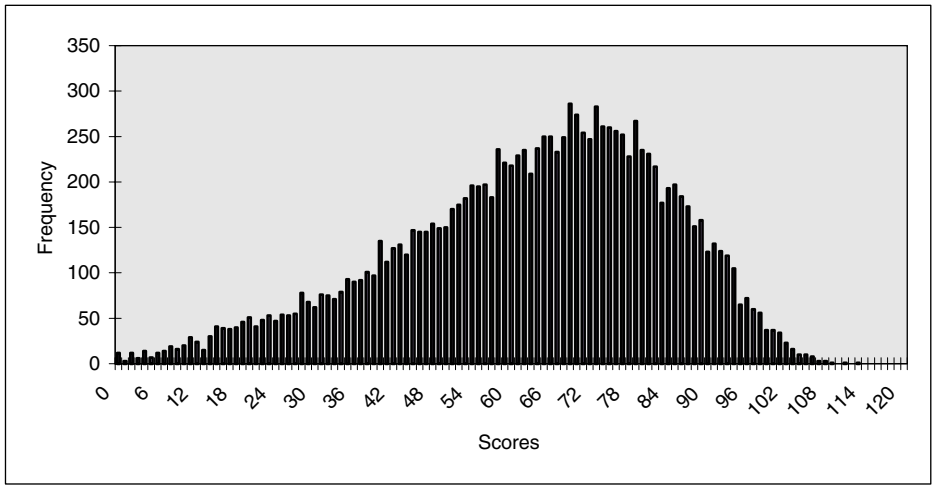
The acceptable answer was:

- if the number of customer requests that could be met quickly increased.

GA IT023 INFORMATION PROCESSING AND MANAGEMENT WRITTEN EXAMINATION

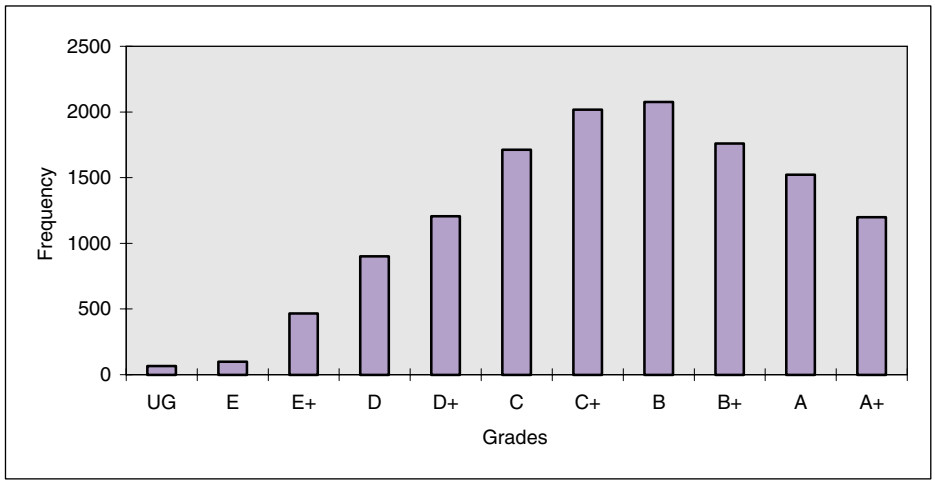
HISTOGRAM OF TOTAL SCORES 2000

Count 13025 Mean 63.01 Standard Deviation 20.59 NA Result 1160



HISTOGRAM OF TOTAL GRADES 2000

Count 13025 Mean 6.41 Standard Deviation 2.26 NA Result 1160



ENROLMENTS		%
Female	6390	45.0
Male	7795	55.0
Total	14185	

GLOSSARY OF TERMS

Count Number of students undertaking the assessment. This excludes those for whom NA was the result.

Mean This is the 'average' score; that is all scores totalled then divided by the 'Count'.

Standard Deviation This is a measure of how widely values are dispersed from the average value (the mean).

Information Systems GA 3: Written examination

GENERAL COMMENTS

Areas of strength and weakness

While the style of the examination paper was similar to previous years, the structure of the questions, and the marking scheme differed significantly. The paper consisted of only seven questions. However, each question was subdivided into two, three and four parts – with each part being worth between 2 and 12 marks. The maximum possible score was 125.

Partly as a result of these changes the raw score mean percentage decreased from approximately 64% in 1999 to 51.5% in 2000. However, the percentage of students awarded each grade was very similar to the 1999 results.

The standard of the student responses to most questions was quite pleasing. It was gratifying to note that almost all students related their answers to the case study. Rarely was an answer marked down because it failed to include reference to the case study. However, the poor quality of students' handwriting was of concern. Teachers should strongly discourage students from using pencil.

On a positive note the number of students who sat the Information Systems examination again increased dramatically, compared to 1999. The approximate numbers were 2250 in 1999 and 2675 in 2000.

Not surprisingly Question 4, relating to algorithm testing, was found to be the most difficult question on the paper. In particular parts b. and c. had by far the lowest mean scores, though part a. was answered much better. At the other end of the scale, Question 3 was the easiest question, while responses to Questions 5a and 7a were awarded the highest marks.

The biggest disappointments were the answers provided for Question 5b, which required an improved backup procedure, and the whole of Question 6.

In a few cases students did run out of time to complete the paper. However, students found Question 7 to be the second easiest on the paper. The fact that students achieved a much lower score on part d. of Question 7 than on the other parts was due to their inability to understand the concept of a 'disaster recovery plan' rather than to shortage of time.

As usual, a number of students did not read the questions properly – and thus failed to distinguish between instructions such as **list**, **discuss**, **describe** and **explain**. As a result students lost marks because their answers were too brief when they were asked to discuss or explain, or they wasted time with detailed answers when they were asked to list. Teachers are urged to impress on their students how important it is to read the question carefully after completing their answer, to make sure the answer covers all aspects of the question.

In some questions students will be given clear directions about the number of points to be raised in the answer. The 2001 exam paper will include an answer booklet that will give students more guidance in the structure of their answers. Refer to 'Study Advice', February 2001 *VCE Bulletin* No. 161, for further information.

SPECIFIC INFORMATION

Question 1

The first step in developing a new system is the process of systems analysis. As part of this process, Fred, the systems analyst, needs to determine facts about the:

- operations of the factory
- current information system
- requirements of the proposed system.

These facts include details of:

- the existing file structures of the accounting system
- the current procedures for ordering and billing.

a.

*Give details of **two other** facts the systems analyst needs to find out about in order to design the new system.*

Acceptable responses were:

- hardware specifications of the existing computer equipment, such as CPU, RAM, disk capacity, peripherals
- software used, such as operating system, name/type of application software, hardware specs required, GUI
- the objectives of the proposed information system, for example a summary of the requirements outlined in the preceding paragraphs of the case study

- workflow – in other words a description of the physical processes that occur.

The above list is not exhaustive; for example, the systems analyst would need to find out how much ABC is prepared to spend on implementing the new system.

In the past, Question 1 has been a straightforward 'pipe-opener' but this question proved to be one of the more difficult questions – especially parts a. and c.

Too often students gave examples that were very specific (the procedure for producing an invoice), or irrelevant (the quantity of each bike part currently in stock). Even when students gave appropriate examples they tended to simply state the information required, for example ABC's budget for the new system, without giving the requested details.

b.

*Describe **two** methods Fred could use to obtain details about each of the following:*

- *the existing file structures of the accounting system*
- *the current procedures for ordering and billing.*

This means a total of four different methods (two for each bullet point). Acceptable responses were:

- file structures: (i) consult manual for details of filenames, field names, (ii) contact helpdesk/support, (iii) run program and examine files
- current procedures: (i) interview specified people (need to specify, for example orders clerk, accounts manager) (ii) observe how staff create orders and accounts, (iii) place a test order and observe its progress through the system, (iv) consult procedural manuals.

Many students gave more or less generic answers to this part of the question (sometimes even listing identical methods for both bullet points) rather than suggesting methods that were appropriate for the information to be gathered. Some students did not even appear to know any of the methods used to gather information in systems analysis.

c.

Fred needs to document the information obtained about current procedures for ordering and billing. List two tools he could use. Describe the purpose of each tool.

An acceptable response was:

Discussion about data flow diagrams, flow chart/NS diagram, pseudocode, IPO charts, decision table/tree, data dictionary. The discussion should indicate the purpose, for example a data flow diagram (DFD) is used to document the flow of data throughout the factory, including data stores and processes.

Very few students associated 'tools' for documenting the information gathered with the (mainly diagrammatic) answers suggested above. Too many students listed a computer, pencil and paper, tape recorders or Word as their chosen tools. Even students who coped well with the DFD in Question 2 did not mention this as a documentation tool in this question. The small number of students who mentioned a data dictionary had very strange notions about its purpose.

Question 2

The data flow diagram provided gives a rough outline of the design of the new system. The 'allocate bike order to bike builder and create parts list' process can be broken down into the sub-processes listed in the table below.

Sub-processes

A. find next bike order for bike to be built
B. determine availability of bike parts for this bike order and update parts file
C. allocate this bike order to bike builder, update bike orders file and generate bike parts list

a.

List the data flow number/s associated with each sub-process A, B and C.

Acceptable responses were:

A – 6
B – 7 and 8
C – 5, 9 and 11

Students experienced some difficulty with both parts of this question. Although the data flows listed in the examination paper were deemed to be correct by the Exam Setting Panel, it could be argued that other data flows may be required, particularly for sub-process C. These extra data flows were accepted without penalty. However, since the question is restricted to the 'allocate bike order to bike builder and create parts list' process, only those data flows going into or out of this process could be considered.

b.

What steps will be required in the 'Create Invoice' process to produce this invoice? The steps in the 'Create Invoice' process should include the source of any other necessary data. You are encouraged to present your answer in an appropriately structured format.

An acceptable response was:

- generate next invoice number
- read system date
- calculate due date for payment
- retrieve customer details from customer file
- retrieve bike parts list from bike orders file
- use bike parts list to calculate total cost of parts
- calculate total cost of bike from total cost of parts plus cost of labour plus profit margin
- print all details on invoice.

This was intended to be a 'broad brush' question. Students were not expected to give a detailed algorithm – just the outline steps. However, students were not penalised for writing a detailed algorithm – provided it contained most of the steps listed above. Pseudocode was the most appropriate format for answers.

A significant number of students described the process in essay format. These students were much more likely to miss vital steps. Students should be strongly urged to present a series of steps (when describing a process or procedure) as pseudocode or other suitable format.

It was difficult, but not impossible, for students who used a DFD to obtain full marks.

Question 3

There is an existing computer in the accounts area. Fred has determined that his design will require another three workstations:

a.

For each new workstation specify:

- *who will use each workstation*
- *where the workstation should be located*
- *for what the workstation will be used.*

The table below shows one possible way to set out an answer.

WS	Who will use it	Location	What it will be used for
1	Catherine Wheel	Reception	Taking bike orders
2	Bike builders	Bike building area	Enter builder ID, print parts list, assign bike to builder
3	Michelle Irons	Stores/Goods In/Out	Sending orders for parts, entering new stock data

This part of the question was well answered, especially by those students who took the advice given in the paper to set out their answer in the form of a table. Providing an answer booklet for the 2001 paper will give students better guidance in the structure and expected length of their answers, and encourage them to write more legibly.

A large number of students listed the Manager (and/or the Accounts manager) as needing a computer. While this was considered to be a reasonable suggestion it was not awarded full marks because the case study indicates that each of the functions in the table above is essential. If students chose the Manager they could still achieve full marks if they combined two of the other functions into the one computer; for example, by combining the stores and bike building functions into the one machine.

Very few students listed a games computer in the tea room as essential.

b.

Data files, such as the bike parts file, will need to be accessed from more than one of these workstations. Fred is unsure whether these data files should be:

- *stored on a separate file-server computer which can be accessed from all the other computers, or*
- *stored on the workstation where the data is first entered. Each workstation would be configured to allow the other workstations to access its data files (peer-to-peer).*

Compare these two options by discussing the advantages and disadvantages.

An acceptable response was:

	Advantages	Disadvantages
File-server	• Centralised data – simplified management of data (including backup) • Accessible by all workstations • Better security	• Server failure means no access to any data • Need fileserver (network) manager
Peer-to-peer	• Cheaper – don't need separate file-server computer • Less cost in initial set up • Accessible by all workstations • Failure of one workstation means only that the workstation's data is unavailable	• More difficult backup • Security not as good • All workstations need to be switched on to access all data

While students scored reasonably well on this part, their answers revealed serious misconceptions about the difference between a centralised (server-based) network and a peer-to-peer network. Many answers were very superficial.

It was particularly disappointing that many students seemed to ignore, or were unaware of, their own school experience of a server-based network. For example, some answers listed as a disadvantage of using a file-server that employees would have to go to the file-server to enter data.

This question was about logical configuration of the network, not physical configuration – discussions of, for example, bus and star networks were irrelevant.

Common misconceptions included:

- peer-to-peer is intrinsically more secure;
- if a file-server is used, employees would have go to the fileserver to enter the data, or enter it locally and then deliberately copy it to the fileserver;
- a file-server model does not need a network;
- the different models need different physical LAN topology – typically star for file-server and bus for peer-to-peer.

Question 4

a.

ABC needs to determine values for the minimum stock level and maximum stock level fields. List four factors that need to be taken into account when determining these values.

An acceptable response was:

Any four of the following: average number used per day, reliability of supplier, delivery time, cost, number per carton, storage space available at ABC.

This part was generally well answered, with the above list by no means exhaustive.

b.

The following algorithm is proposed to carry out the reordering process described above.

```
Open Parts File for Input
Open Order_Item File for Output
While NOT End of Parts File
  Read Part_Number, Quantity_in_Stock, Minimum_Stock_Level,
    Maximum_Stock_Level from Parts File
  If Quantity_in_Stock = Minimum_Stock_Level Then
    Date_Ordered ← System Date
    Quantity_Ordered ← Quantity_in_Stock – Maximum_Stock_Level
    Write Date_Ordered, Part_Number, Quantity_Ordered to
      Order_Item File
  End If
End While
Close Parts File
Close Order_Item File
```

To test this algorithm:

- *design test records that could be inserted into the parts file*
- *explain your choice of values for each of these test records*
- *indicate the expected output to the order file (if any) for each test record.*

Note that values have not been entered for fields that are not read in, since they are not relevant. An acceptable response and sample values are shown below.

Part Number	***Quantity in stock***	***Minimum stock level***	***Maximum stock level***
ABC12	*3*	*20*	*50*
ABC34	*50*	*50*	*100*
ABC56	*100*	*50*	*200*

Part Number	***Reason for choosing values***
ABC12	*Stock below Minimum_Stock_Level*
ABC34	*Stock equals Minimum_Stock_Level*
ABC56	*Stock above Minimum_Stock_Level*

Part Number	***Date ordered***	***Part number***	***Number ordered***
ABC12	*(Today's date)*	*ABC1*	*47*
ABC34	*(Today's date)*	*ABC34*	*50*
ABC56	~	**No output**	~

Answers to this part of the question were the least successful on the paper, with nearly half the students scoring zero. Choice of test data is a very important skill when developing an algorithm.

Since this algorithm is concerned only with the reorder process, and the only test carried out is a comparison of 'Quantity_in_Stock' with 'Minimum_Stock_Level' students were expected to choose values for three test records, where the Quantity_in_Stock is less than, equal to, and greater than the Minimum_Stock_Level.

Many of the students who had some idea about test data spent a considerable amount of time generating records to test data validation instructions, ignoring the fact that the algorithm does not attempt any data validation.

c.

Find the errors in this algorithm and explain how to correct them by using a bench test or any other suitable method.

Answer: Bench test (Desk check)

Step	***Variables***							***Output***
	Part Number	*Number in stock*	*Reorder amount*	*Maximum stock level*	*Date ordered*	*Number ordered*	*Test*	
Open Parts File for Input								
Open Order File for Output								
While NOT End of Parts File							*FALSE*	
Read Part Number, Number in stock, Min stock level and Max stock level	*ABC12*	*3*	*20*	*50*				
If Number in Stock = Min stock level Then – FALSE	*ABC12*	*3*	*20*	*50*			*FALSE*	*If FALSE – no output *PROBLEM*
While NOT End of Parts File	*ABC12*	*3*	*20*	*50*			*FALSE*	
Read Part Number, Number in Stock, Min stock level and Max stock level	*ABC34*	*50*	*50*	*100*				
If Number in Stock = Min stock level Then TRUE	*ABC34*	*50*	*50*	*100*			*TRUE*	
Date ordered < system date ( )	*ABC34*	*50*	*50*	*100*	*10/3/00*			
Number ordered < Number in stock – Maximum stock level	*ABC34*	*50*	*50*	*100*	*10/3/00*	*–50*		*Negative number *PROBLEM*
Write Date ordered, Part Number, Number Ordered to Order File	*ABC34*	*50*	*50*	*100*	*10/3/00*	*–50*		*10/3/00, ABC34, –50*
While NOT End of Parts File	*ABC34*	*50*	*50*	*100*	*10/3/00*	*–50*	*FALSE*	
Read Part Number, Number in stock, Min stock level and Max stock level	*ABC56*	*100*	*50*	*200*	*10/3/00*	*–50*		
If Number in Stock = Min stock level Then – FALSE	*ABC56*	*100*	*50*	*200*	*10/3/00*	*–50*	*FALSE*	*No output – correct*
While NOT End of Parts File	*ABC56*	*100*	*50*	*200*	*10/3/00*	*–50*	*TRUE*	
Close Parts File	*ABC56*	*100*	*50*	*200*	*10/3/00*	*–50*		
Close Order File	*ABC56*	*100*	*50*	*200*	*10/3/00*	*–50*		

Errors in algorithm:

- Relational operator in 'If' statement should be < = (not =)
- Number Ordered ‹ Number in Stock – Maximum stock level is back to front – it should be:
  Number Ordered ‹ Maximum stock level – Number in Stock.

Students did receive credit for spotting the (unintentional) error in the last line of the algorithm, which should have read:

Close Order_Item File

Although more than half the students scored zero on this part overall, a slightly better outcome was achieved than on the previous part.

It was surprising that a number of students who had little idea about test records could spot and correct the errors.

The number of students who made 'corrections' to perfectly valid instructions was of concern. For example:

- the 'While' statement should be 'Do till eof'
- the 'If' statement has no 'Else'
- there is no command telling it to go on to the next stock item
- there is no 'UNTIL End of Parts File' statement.

There were also students who wanted to include data validation instructions.

Students should be encouraged to look at the essential elements of any similar future question, and not worry about features that are not there.

Question 5

Fred (the systems analyst) is not happy with the manager's suggested procedure.

a.

*List **four** important concerns that Fred might have about this procedure.*

An acceptable response was:

Inefficiency (waste of Lucy's time), backup relies too much on Lucy, for example, it may not be carried out if she is away, storage space on a floppy disk is likely to be too small, data will not be backed up if it is being used at the time of backup (clash with re-ordering process), timing of backup (not after end of working day), location of backup disks, no rotation of backup media, accumulation of large numbers of backup disks.

This was the second most successfully answered part, with most students obtaining either 3 or 4 marks out of 4. However, many students focused almost exclusively on the limitations of the floppy disks themselves.

b.

Suggest a better backup procedure, include any new hardware/ software that may be needed by your procedure.

An acceptable response was:

Purchase a tape drive and at least seven suitable tapes. Install the tape drive in one of the computers on the network – preferably the fileserver. Install backup software that allows a timed automatic data backup to be set up. The tapes should be labelled one for each day of the week Monday to Friday leaving two spare to do a backup once a month to be kept in a different place to all the daily backups (but off-site).

The process Lucy could then use would be:

- Every morning check that the previous night's tape has worked successfully.
- Remove that tape and store either in a fireproof safe or leave ready to be stored off-site.
- Place correct day's tape into the drive ready for automatic backup at the end of the day.
- At the end of each month create a complete backup on one of the monthly tapes, and store this tape off-site.

Of concern was the standard of student answers to this part. An all-too-frequent answer went along the lines of: 'A better backup procedure would be a tape drive.' Many students appeared to have little idea what the word 'procedure' means.

Perhaps there is confusion between 'people procedures' – the set of steps taken to carry out a task (who, what, where, when, and how) and 'subprogram procedures' – the set of instructions (written in a computer language) needed to make a computer perform a task.

The question invited students to mention any new hardware or software required and then give details of a better backup procedure. A procedure is a set of steps. It would be best written as a set of steps – not in 'essay style'.

To obtain full marks students needed to:

- suggest an improved backup medium (many students were keen on Zip disks – which were quite acceptable – but students need to be reminded that Zip disks are not very robust)
- suggest an improved timing regime for backups
- suggest improved storage locations for the backups
- suggest rotation of the backup media
- outline a backup procedure.

If students choose to use mirroring (of hard disks – for example RAID arrays, or of file servers) to achieve backup they need to explain this concept. Such students should also be made aware that, even with mirroring, some form of backup is still usually required (in case of a total 'melt-down').

Another concern was the imprecise terminology used by a few students. There were suggestions that 'Zip tapes' and 'tape disks' might be used for backup.

c.

*Discuss **two** reasons why your procedure is better than the one suggested by the manager.*

An acceptable response was:

This procedure would be much more efficient as Lucy would only need to spend about 5 minutes a day to do the backup instead of perhaps an hour.

Setting the backup to start at the end of the day will mean that all computers will be able to be used right up to closing time and that all files will be backed up. (If the procedure suggested by the manager is used it will mean that each person will not be able to use their computer while Lucy is backing it up and everything that is done on that computer will not be backed up that day.)

Students achieved a better standard on this part than on part b. Many students who gave very limited answers to part b. could still give a good discussion of two reasons why their procedure was better than the manager's.

Question 6

Fred has contracted the Big Yellow Cabling Company (BYCC) to install the electric power and data cabling in the bike factory.

BYCC have estimated that it will take:

- 2 days to lay the required network data cables
- 3 days to wire up the required power points

- 1½ to 2 days to set up the computers which includes:
  - connecting the new computers to the network
  - connecting the existing computer to the network
  - installing and configuring the required software on all computers.

The factory cannot afford to have its existing computer system out of action during the working week. The manager suggests that the cable laying and wiring could be done during this time since it will not interfere with the operation of the factory. After the cable and wiring are complete the computers could be set up during a weekend. The system could be completed by Sunday afternoon, including connecting the existing computer. It would then be ready for Monday morning.

a.

Name the changeover strategy that the manager is suggesting.

The expected answer is direct changeover – or any name that suggests that the changeover is being done immediately.

Overall, Question 6 was the second-most-difficult question on the paper. Part a was surprisingly poorly answered – with well over half the students scoring zero. Many students suggested phased, pilot or parallel changeover as the method.

b.

Discuss any problems that might arise if this strategy is adopted.

An acceptable response was:

The main potential problems include the following:

- doesn't allow much time, if any, for testing
- no fall-back strategy – if the new system isn't fully operational by Monday morning ABC has no computer system
- no time allocated for staff training.

Students were expected to use a couple of sentences to elaborate on two of these problems.

Many students could only suggest one problem – the question did require the discussion of problems.

c.

Suggest another strategy and explain why you think it is better.

An acceptable strategy was:

- set up all other computers, and test
- backup all existing files
- on weekend hook in existing computer and test
- fall-back – disconnect new computers and restore system to existing configuration
- run paper system in parallel until happy.

An explanation of why the above strategy is better than the manager's suggestion could include that there is a contingency plan that will allow ABC to keep operating if the new system doesn't work and a different strategy would give more time for testing and staff training.

The best student answers named and described a parallel changeover strategy, then went on to explain that this would overcome the problems with lack of testing and staff training. Unfortunately many students either did not describe their chosen strategy properly and/or did not explain why it was an improvement.

Some students described strange and inappropriate variations on the suggested strategy.

Question 7

Once the changeover is complete, the continued successful operation of ABC will depend on the reliability of this computerised system. Three possible events that may affect this reliability are:

- staff may take files home on floppy disks and bring them back infected with a virus
- one or more computers may break down or be stolen
- there may be an electric power failure or a fire at ABC.

a.

List three problems that these kinds of events might cause for ABC.

Acceptable responses included: loss of data, malfunction of programs, staff unable to use computers, if file server out of action factory ceases production, if fire then factory ceases production.

Overall this was the second-best answered question on the paper, and part a was the easiest part question on the paper – two-thirds of the students scored 3 marks out of 3.

b.

Describe three ways that these kinds of events affect the people working for ABC.

Acceptable responses included: temporary lay-offs, loss of income, lots of overtime when system resumes operation, victimisation/lionisation of staff perceived to cause problems, forbidden to take disks home.

This part was generally well-answered. Some answers were too brief to qualify as descriptions (the sample answers above need some enlargement). The question asked for the effect on people but, some students ignored this.

c.

List four measures that ABC could take to minimise the chances of the system becoming unreliable?

Acceptable responses included: install virus-checking software, fire extinguishers, fire alarms, UPSs, regular maintenance.

This part was handled well, mainly because students were only required to list four single phrase answers to achieve full marks.

d.

ABC needs to develop a disaster recovery plan. Describe three strategies that should be included in this plan.

Acceptable strategies that required a description included:

- back up of all data on a regular basis
- make sure backups are available
- have technical assistance on stand-by to assist in recovery
- install a stand-by fileserver in a remote location which contains a mirror of the live data so that it can be brought online in case of disaster
- workstations should be able to switch to other functions if necessary
- manual fall-back system
- train staff so that they know what to do when a disaster occurs.

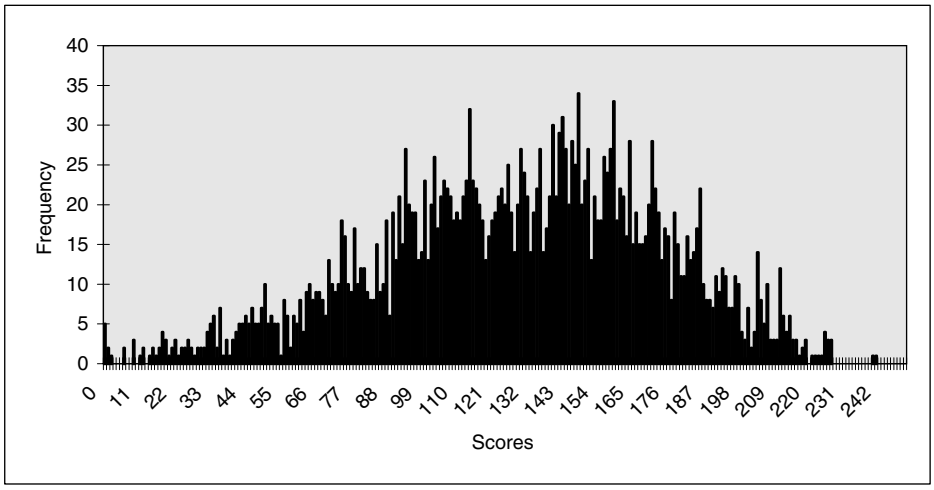
This part of the question required a description – most of the points raised above do not qualify as a 'description' – and was poorly answered.

Beyond emphasising the need for backups to be available, few students were able to describe strategies that would be part of a disaster recovery plan. The point about recovering from a disaster is that the disaster has already happened, so whatever measures are suggested must keep this fact in mind.

GA IT033 INFORMATION SYSTEMS WRITTEN EXAMINATION

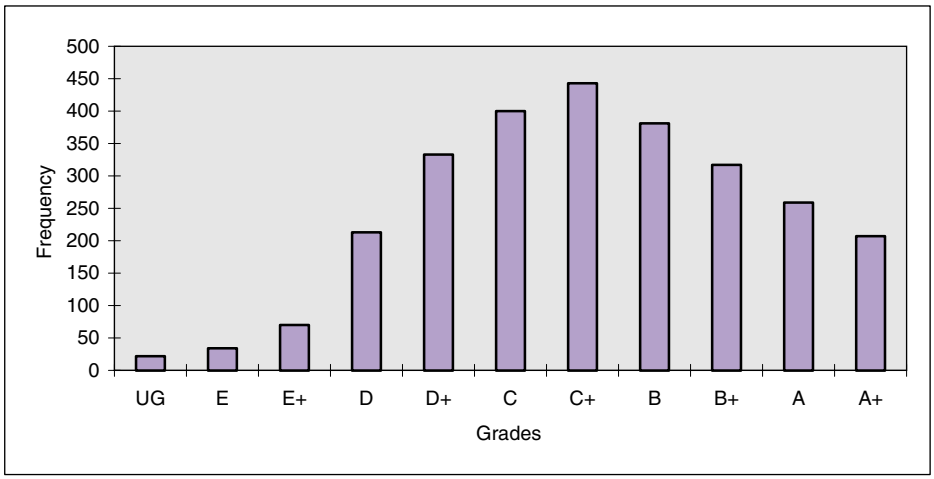
HISTOGRAM OF TOTAL SCORES 2000

Count 2679 Mean 128.94 Standard Deviation 44.33 NA Result 220



HISTOGRAM OF TOTAL GRADES 2000

Count 2679 Mean 6.12 Standard Deviation 2.26 NA Result 220



ENROLMENTS		%
Female	339	11.7
Male	2560	88.3
Total	2899	

GLOSSARY OF TERMS

Count Number of students undertaking the assessment. This excludes those for whom NA was the result.

Mean This is the 'average' score; that is all scores totalled then divided by the 'Count'.

Standard Deviation This is a measure of how widely values are dispersed from the average value (the mean).

Materials and Technology GA 3: Written examination

GENERAL COMMENTS

As in previous years, this year's written examination was designed to assess the student's knowledge and understanding of Unit 3 – Area of study 1, Processing of materials, Unit 3 – Area of study 2, Classification of Materials, and Unit 4 – Area of study 2 – Newly developed or modified materials. The 10 assessment criteria for the examination, which were published in the *VCE Bulletin*, were drawn from these 3 areas of study and provide further detail about the content of the examination.

Criterion 1 Understanding of unprocessed materials

Students are required to be aware of the variety and origins of unprocessed materials.

Criterion 2 Analysis of factors influencing the processing of materials

Students are required to be aware of the influence of social, economic and environmental factors, (such as: trends, costs, Australian standards, by-products, and scarcity of resources), which influence the processing of materials. Students should have an understanding of these factors and their relative importance.

Criterion 3 Understanding of the variety of types/ forms of materials resulting from processing

Students are required to be aware of the sequence of processing of raw materials into more useable forms, and the physical and chemical changes, which occur at each stage of processing. Students should be able to compare the different forms of processed material, which can be derived from the same raw material.

Criterion 4 Understanding of the characteristics of newly developed or modified materials

Students are required to be able to compare the characteristics of a newly developed or modified material with those of an existing material, which it can be used to replace.

Criterion 5 Understanding of the uses of newly developed or modified materials

Students are required to describe the uses of a newly developed or modified material, and the advantages and disadvantages of its use.

Criterion 6 Understanding of Australian Standards relating to processed materials

Students are required to have knowledge of an Australian Standard relating to the material category they studied, as well as understanding the reasons for the existence of Australian Standards and the process for their review.

Criterion 7 Understanding of basic chemical and physical characteristics of materials

Students are required to have an understanding of a range of chemical characteristics, such as molecular composition, reaction to other chemicals and flammability, and a range of physical characteristics such as strength, texture, taste, elasticity, density and appearance, for a range of materials. Students should be able to comment on how these characteristics affect the way the material is used.

Criterion 8 Understanding of commonly accepted classifications

Students are required to show a commonly used method of classification of materials, naming all sections and showing examples of materials in each section of the classification. Students should be aware of the similarities and differences between materials within different sections of the classification.

Criterion 9 Understanding of the use of classification to assist decision making

Students are required to explain in detail how their knowledge of the classification system helped them with decision making in their production work.

Criterion 10 Evaluation of products according to established criteria

Students are required to comment on the criteria they wrote to evaluate their products, as well as the reasons for developing these criteria.

The description of the task also states that:

In addition, the questions will assess students' understanding of the uses of the material and tools, equipment and processes employed to manipulate the material to produce useful products.

This indicates that a student is also required to be familiar with the materials in the materials category that they studied, and the tools and equipment used to work with the material. This knowledge would come mainly from the student's materials testing and production work.

The paper consisted of six short-answer questions, which covered the criteria listed above.

Although Materials and Technology will not be offered in 2001, there are some general recommendations, which may also apply to the new subjects. Students need to:

- read questions carefully to ensure that they are answering what the question is asking;
- be aware of the meaning of the main words and phrases used in the study, such as classification, processed material, raw material, chemical characteristics, physical characteristics, stages of processing, consumers and manufacturers;
- be aware of the meaning of words used to ask questions in the examination, including name, describe, explain in detail, give reasons, state and give examples;
- be aware of the marks allocated to each part of a question within the whole exam paper.

Areas of strength and weakness

Areas of strength included:

- describing the products made during the year
- explaining the processes and tools and equipment used to make the product
- explaining the choice of materials for the product
- explaining the classification of materials
- describing the processing of a raw material into a more useable form
- describing the physical characteristics of materials, including newly developed or modified materials
- naming a range of materials that can be produced from a raw material, and explaining the use of each material
- describing the advantages and disadvantages of using a newly developed or modified material compared with using an existing material
- naming and explaining an Australian Standard.

Areas of weakness included:

- naming criteria used to evaluate the product and using these criteria for evaluation
- describing the chemical characteristics of materials, including newly developed or modified materials
- explaining the differences between a raw material and a processed material
- explaining why Australian Standards make materials healthier and safer to use
- explaining social, environmental and economic factors that need to be considered by manufacturers.

SPECIFIC INFORMATION

Question 1

a.

Students were required to describe six aspects of their product and, generally, 1 mark was awarded for each point made about the product. No mark was awarded for naming the product made.

b.

Students had to name two pieces of equipment used in making their product, and state the process performed by that piece of equipment, and give a reason why the piece of equipment was suitable for that process. Each part of the question was worth 1 mark, with a total of 6 marks for this section.

c.

A total of 4 marks were awarded and students were required to name two materials used to make their product, and state how the material was used, and why it was suitable for this use. No marks were awarded for naming the material; 1 mark was awarded for naming the use of each material, and another mark was awarded for giving a reason the material was suitable for that use.

d.

Six marks were awarded for this part of the question. One mark was awarded for naming each criteria used to evaluate the product, and 4 marks were awarded for the students' evaluation of their product based on these criteria, which was 2 marks for the evaluation according to each criterion.

Generally, students were able to provide a good description of their product, as required in part a. of the question. Many students did not include all of the basic information about the product, such as the size of the product and the materials used, and so were not awarded full marks. A number of students used sketches to describe their product, although to gain full marks the drawing needed to be fully annotated.

In part b. most students scored very well. They were able to describe the process each tool was used for and the reason it was suitable for that use. The most common error in answering this question was to further describe the process conducted by the tool in the third part of the question, rather than describing why the tool was suitable for that process.

Associated materials, such as a hinge or screw used in a wooden cabinet, or a zip or thread used in a garment were accepted in part c., and the answers given were generally sufficient to gain full marks.

In part d. most students were able to provide two criteria that related to their product. However, a large number of students did not provide sufficient detail in their evaluation using these criteria, and so were not awarded full marks.

Question 2

a.

Three marks were awarded to students for providing a complete classification system for their material. Examples of materials in the different parts of the classification were not required.

b.

Students had to describe two examples of ways the classification system could be used to assist in the selection of materials. Two marks were awarded for each example; 1 mark for a simple answer and 2 marks for a more detailed answer.

c.

A total of 8 marks were awarded for the completion of the table. No marks were allocated for naming the material or the section of the classification it comes from. One mark was awarded for providing each of the physical characteristics and 1 mark was awarded for providing each of the chemical characteristics.

A significant number of students did not answer this question well. About 25% of all students did not get any marks in part a. of

the question. A similar number of students were not able to provide any examples of how the classification system could be used when selecting materials to be used in production work. Students who did provide examples of the use of the classification system often did not provide sufficient detail to be awarded full marks.

In part c. students were generally able to provide physical characteristics of the materials, but often were not able to provide the chemical characteristics. A number of students lost marks because they wrote about the characteristics of two different materials that came from the same area of the classification system; this meant that they could only be awarded marks for one of the two materials that they wrote about.

Question 3

a.

Ten marks were allocated for part i. of this question; 1 mark each for naming the newly developed or modified material and the existing material, and 1 mark for each physical characteristic and 1 mark for each chemical characteristic. In aii. 1 mark was awarded for naming a situation in which the newly developed or modified material could replace the existing material, and 2 marks were allocated in part iii. for providing an explanation as to why the newly developed or modified material is a suitable replacement for the existing material.

b.

A total of 3 marks were awarded for part b of this question. One mark was allocated for naming the area of the classification in which the modified material is placed, and 2 marks were allocated for explaining why the material is placed in this area of the classification.

c.

Worth a total of 6 marks. Students were required to explain a social, environmental and economic implication of processing or using the material. Two marks were awarded for the explanation of each of the factors listed. One mark was awarded for a simple answer, and 2 marks were awarded for a more detailed answer.

In part a. students were mostly able to name a newly developed or modified material and an existing material. They were also mostly able to provide the physical characteristics of the materials. However, students had difficulty in providing the chemical characteristics of the materials.

Students found it difficult to answer part b., and almost 50% the students did not gain any marks. Students who were able to provide an answer often did not provide enough detail in their answer to gain full marks.

Most students attempted part c., although few provided sufficient detail to be awarded full marks. Answers that did not relate the factors to the newly developed or modified material were not awarded any marks.

Question 4

a.

This question required students to name three processed materials that could be made from the same raw material. One mark was awarded to students for naming a raw material, and another mark was awarded for naming the origin of the material. In part iii., students were awarded 1 mark for naming each processed material, 1 mark for providing a use for the processed material, and 1 mark for explaining why the processed material is suitable for that use.

b.

Students were required to describe two physical characteristics of the raw material for 2 marks; 1 mark was awarded for each physical characteristic of the raw material.

c.

Students were required to describe two chemical characteristics of the raw material; 1 mark was awarded for each chemical characteristic of the raw material.

The main mistake that students made in part a. was that in part iii. they wrote about processed materials that came from different raw materials rather than processed materials coming from that named in part i. Students were only awarded marks when they wrote about materials that resulted from the processing of the raw material that they named in part i. of the question. A number of students lost marks because in part iii. they wrote about products rather than materials. For example, if the raw material was wheat, students were awarded marks for writing about self-raising flour as a material resulting from the processing of the raw material, but were not awarded marks for writing about a cake, because a cake is a product rather than a material.

A number of students lost marks in part b. of this question because they wrote about the physical characteristics of a processed material rather than writing about the physical characteristics of the raw material that they had named in part i.

Part c. was very poorly answered, with more than half the students being awarded zero for this part of the question.

Question 5

a.

Ten marks were allocated for part a. of Question 5; five stages of processing had to be named and described in this question, and 1 mark was allocated for naming each stage and 1 mark was allocated for describing what happened to the material at each stage that was named.

b.

One mark was awarded for correctly naming the resulting processed material.

c.

Two marks were awarded; one for each of the ways in which the processed material is different from its unprocessed form.

Generally, students were able to provide 5 different stages of processing and explain what happens at each of these stages. A number of students lost marks because they wrote about either transportation or sale of the material, and neither of these is considered to be a stage of processing. There must be a change to the material for it to be considered a stage of processing, and neither transportation nor sale causes a change in the material.

Most students who answered part a. correctly were able to answer part b. also.

In part c. generally students were able to name at least one way in which the processed material differed from the raw material.

Question 6

a.

Worth a total of 6 marks, with students required to explain social, environmental and economic factors that should be considered by manufacturers. Two marks were awarded to students for writing about each of the factors listed. Students needed to include two points in order to gain the 2 marks in each section, and were only awarded 1 mark for a simple answer.

b.

In part i. students were only required to name the standard, and the standard number was sufficient to be awarded the marks. The standard had to relate to the material studied. Part ii. required students to describe the standard controls and 2 marks were awarded for a detailed answer. Part iii. was also worth 2 marks, with students required to give two points as to what could happen if the material did not comply with the standard in order to gain the 2 marks.

c.

This required students to explain a quote – and 2 marks were awarded to students who made two points in their response.

Part a. of this question was not well answered, with less than 12% of the students being awarded the full 6 marks for their answer. Many answers lacked the depth required to gain more than half of the marks, and a number of students did not relate their answer to the manufacturer's processing decisions.

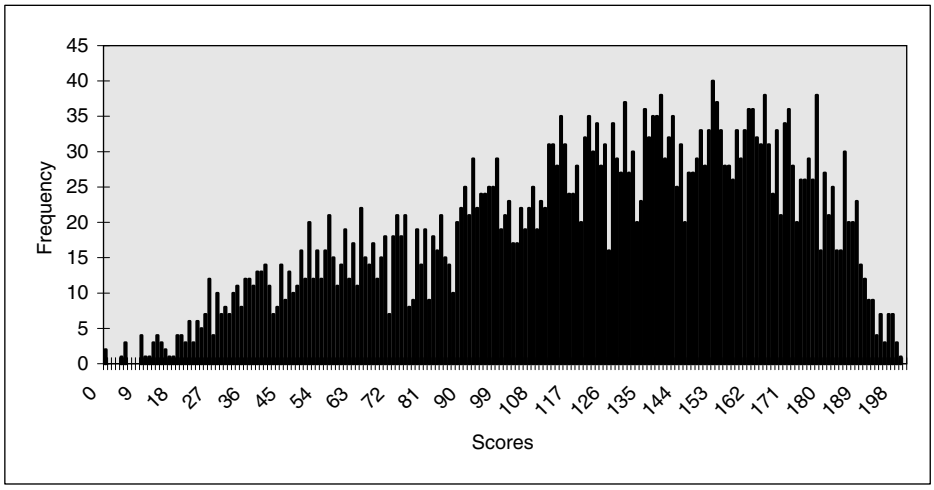
Students provided better responses to part b., although a significant number of students did not attempt it. Students who named a standard were generally able to give some explanation as to what is controlled by the standard. Fewer students were able to explain what could happen if the material did not comply with the standard named.

Most students attempted the final question, although a significant number of students were not awarded any marks as they simply rewrote the quote.

GA MT033 MATERIALS AND TECHNOLOGY WRITTEN EXAMINATION

HISTOGRAM OF TOTAL SCORES 2000

Count 3740 Mean 120.49 Standard Deviation 44.82 NA Result 866



HISTOGRAM OF TOTAL GRADES 2000

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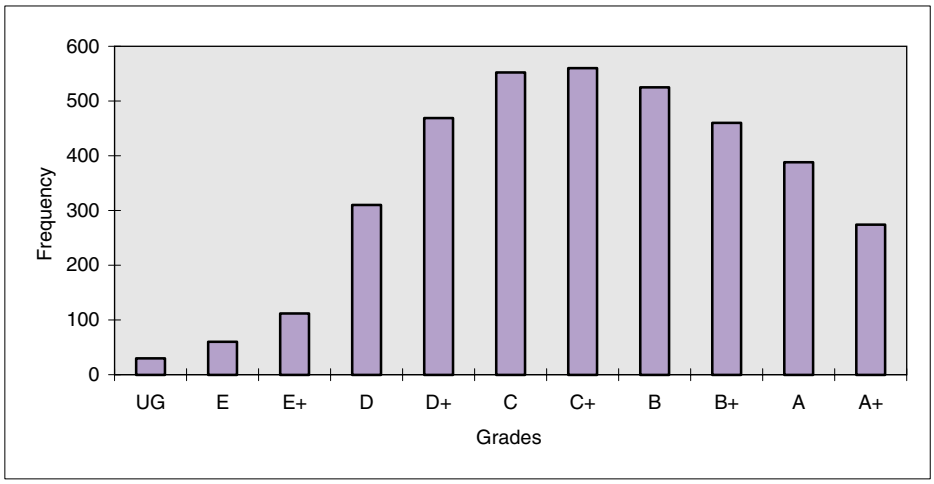


ENROLMENTS		%
Female	1988	43.2
Male	2618	56.8
Total	4606	

GLOSSARY OF TERMS

Count Number of students undertaking the assessment. This excludes those for whom NA was the result.

Mean This is the 'average' score; that is all scores totalled then divided by the 'Count'.

Standard Deviation This is a measure of how widely values are dispersed from the average value (the mean).

Systems and Technology GA 3: Written examination

GENERAL COMMENTS

This examination was designed to assess students' knowledge of integrated technological systems as well as the concepts of closed-loop feedback systems. Students were required to demonstrate specific knowledge and understanding of mechanical or electrical/electronic systems, acquired during Systems and Technology, Units 3 and 4.

The examination paper consisted of two questions. Question 1 tested students' knowledge of the integrated technological systems they had studied, as well as closed-loop feedback concepts. Question 2 tested specific student knowledge of mechanical or electrical/electronic systems. Students had the choice of responding to structured questions about either mechanical or electrical/electronic systems.

The examination required students to show knowledge of:

- integrated technological systems and subsystems
- the function of a system and its associated subsystems
- the function of components found in systems and subsystems
- technical and scientific principles associated with the function of systems and subsystems
- advanced testing and measurement principles and techniques
- methods of achieving control and feedback in closed-loop systems
- codes of practice
- technical information.

Areas of strength and weakness

In Part A of the paper, students were asked to answer questions relating to a system/subsystem analysis of production activities they had carried out during the year. The responses to these questions were generally well written and showed a noticeable improvement from previous years. Most answers included detailed data with applicable measurements, indicating that students had a sound technical understanding of the operation of their individual productions.

The advanced testing and measurement section of the paper was well answered with most students receiving greater than half of the allocated marks for each individual section.

When questions required an understanding of a particular concept, as with the closed-loop feedback section, a significant number of students failed to receive any marks. This was evident because, although similar questions had appeared in previous exams, students were asked to analyse from a different perspective to past years. Teachers need to ensure that students have learnt concepts thoroughly rather than just the content of previous examinations.

Students who achieved high results in this examination had a sound understanding of their individual production activities, excellent analytical and conceptual skills and were prepared to fully answer all questions. This exam has gradually increased in difficulty over the past 4 years. The 2000 exam was the last of this type of format and was the most difficult in that it required students to answer in greater depth and detail.

Where students at least attempted questions, some marks were awarded, provided the response was relevant to the question. Forty-one females and 1303 males sat the paper, with approximately half the students selecting the mechanical section; and the other half, the electronic section.

SPECIFIC INFORMATION

Question 1 – Integrated systems (50 marks)

ai–iv. (2 + 2 + 1 + 2 + 1= 8 marks)

Students had to fully name an integrated technological system then list and categorise two of its subsystems. They were awarded 2 marks for giving the full name of the system. Subsystems 1 and 2 had to be fully named and directly related to the integrated system they named to be awarded full marks (2 + 2 + 2 = 6 marks).

Subsystems 1 and 2 had to be categorised as either mechanical and/or electrical and/or electronic for students to be awarded 2 marks (1 + 1).

These questions were well answered. The students who were awarded full marks provided a clear description of the integrated system and both subsystems, including the subsystems' categories.

bi–vi. (2 + 1 + 2 + 2 + 1 + 2 = 10 marks)
These questions required students to describe the input, process and output of each of the subsystems identified in Question 1a.
i–iii.
Subsystem 1. A maximum of 5 marks was awarded for a clear description of the input, process and output, including specific values with correct terms and units being used.
iv–vi.
Subsystem 2. Marks were awarded as for Questions 1bi–iii. Students who performed well provided a clear description of the input, process and output of each subsystem, including specific values, terms and units. This indicated that these students had a fundamental understanding of how the system worked.
ci–viii. (1 + 2 + 3 + 3 + 3 + 3 + 2 + 3 = 20 marks)
Students were required to answer a sequence of questions regarding the diagnosis of a possible fault that could occur with the system identified in Question 1a. To achieve high marks, students had to be fully conversant with the type of fault, the necessary test equipment to diagnose the fault, how the equipment was set up and the nature of the specific readings that would be obtained. In addition, they were asked to clearly state how the fault could be rectified and any precautions that would need to be observed.

These questions were well answered. Students who achieved high marks selected faults and named sophisticated test equipment in the advanced testing category. The written responses from these students indicated a sound understanding of the fault, the type of test equipment used, procedures and specific numerical data. Students who received low marks tended to select very basic or generalised faults that did not require advanced testing and measuring equipment to analyse the fault. This led to an inability to quantify and record details in a scientific and sequential manner.
di–v. (1 + 1 + 4 + 2 + 4 = 12 marks)
Students were required to analyse a conceptual drawing of a closed-loop system and to answer questions that related to the theoretical operation of closed-loop systems. Students were also required to demonstrate their knowledge of a practical application of this type of system and describe its operation.

These questions were poorly answered. Many students did not attempt this part. Students who did attempt the questions received high marks and clearly understood closed-loop systems and how they operate in specific practical examples. Results indicate the need to better prepare students for these types of questions.

Question 2 – Part A – Mechanical systems

a. (25 marks)
These questions focused on heat exchange devices and the scientific and technical principles behind their operation. The example illustrated was of a typical motor car cooling system. Many individual drawings of the associated subsystems were included and students were required to analyse these drawings and answer associated questions. These questions required the ability to interpret technical information and an understanding of scientific and technical principles.

Students who attempted these questions tended to achieve good results with a large percentage receiving marks of 50% or above in individual questions. This indicates these students were well prepared and had good analytical skills. However, of concern is the high proportion of students who did not attempt some of the questions in this section.
b. (25 marks)
These questions focused on the interpretation of data (gearing, ratios, mathematical formula and mechanical methods) for a chair lift assembly. The drawings were obtained from a company who supplies and services chair lifts. To achieve high marks in this section, students needed to carefully examine and interpret the technical information provided on the drawings.

Of concern was the high number of students who received zero marks in this section, generally because they did not attempt the questions. However, if students attempted the questions, most results were greater than 50%. This would indicate a sound preparation of students by their teachers.

Question 2 – Part B – Electrical/electronic systems

a. (25 marks)
These questions focused on an electronic sound-activated circuit. Students were required to analyse the circuit in detail and answer questions which related to electronic circuit diagrams, the function of components within the circuit and their associated terminology and values. To answer these questions students required a basic knowledge of electronic components and their circuit function and the ability to read and interpret simple electronic circuit diagrams.

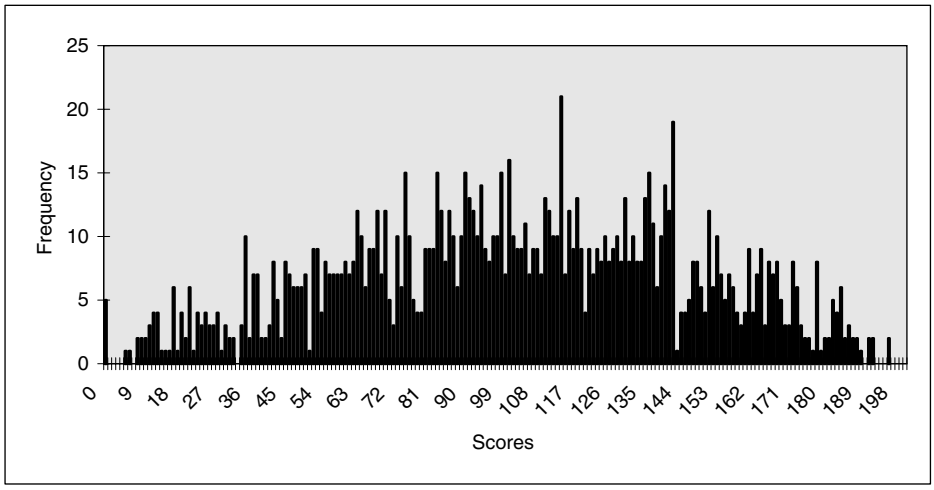
The average score for most questions was slightly below 50%. More students gained full marks in this section than in any other.
b. (25 marks)
These questions required students to analyse and interpret technical information associated with the electrical/electronic operation of the chairlift system. Students were required to understand how to forward and reverse the chairlift through the use of simple switching techniques and interpret electrical/electronic circuit data related to electrical/electronic operation of the chairlift. Students who carefully examined the drawings and the text had little difficulty answering the questions.

A large number of students did not attempt the question, despite this sort of question, regarding the forward and reversing of a DC motor having been on the paper in different guises for many years.

GA ST033 SYSTEMS AND TECHNOLOGY WRITTEN EXAMINATION

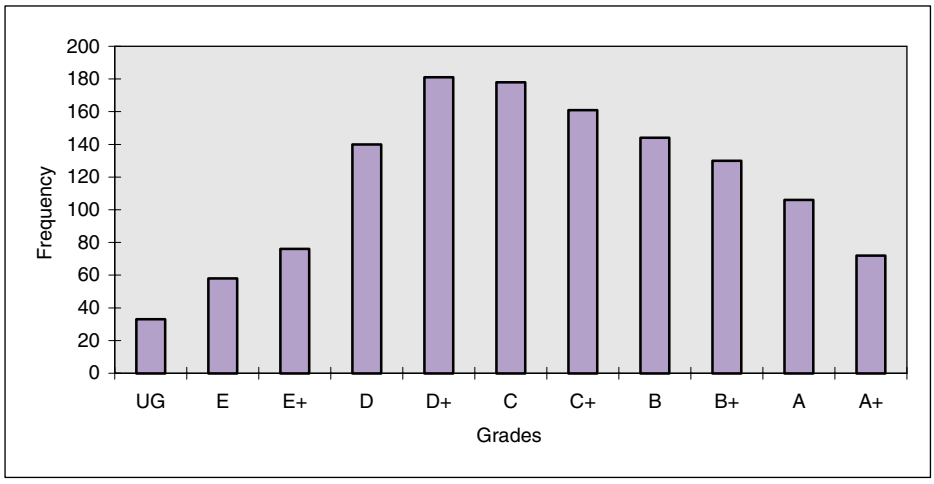
HISTOGRAM OF TOTAL SCORES 2000

Count 1279 Mean 102.45 Standard Deviation 43.19 NA Result 390



HISTOGRAM OF TOTAL GRADES 2000

Count 1279 Mean 5.42 Standard Deviation 2.56 NA Result 390



ENROLMENTS		%
Female	50	3.0
Male	1619	97.0
Total	1669	

GLOSSARY OF TERMS

Count Number of students undertaking the assessment. This excludes those for whom NA was the result.

Mean This is the 'average' score; that is all scores totalled then divided by the 'Count'.

Standard Deviation This is a measure of how widely values are dispersed from the average value (the mean).

Technological Design and Development GA 3: Written examination

GENERAL COMMENTS

Areas of strength and weakness

- Time management has improved with most students attempting all sections of the paper.
- Identifying appropriate criteria for evaluation was answered in more depth and accuracy than in previous years.
- Marketing appeared to be well understood by most students.
- Ergonomics was not well understood, with students confusing safety standards with ergonomic considerations.
- Students need to provide detailed annotations to show they understand its important role in communicating aspects of a design.

Design options

As the design process is the focus of this study, and the representation of design options are an important part of the design process, it is heartening to notice an ongoing improvement in the quality of designs that show imagination and flair. However, there needs to be a greater focus on clear communication of design options. Teachers need to equip students with specific language, terminology and techniques to enable them to communicate their ideas and designs more effectively.

SPECIFIC INFORMATION

Section A

Question 1

Part a – Analysis of the advertisement

This question was well answered, as most students were able to give logical justifications as to why specific consumer groups were targeted.

Part b – Marketing

This area showed improvement on previous years, with students being able to accurately match and justify the methods of marketing suitable for the potential consumer group.

Question 2

Part a – Identification of a design feature

The advertisement was well analysed and most students identified an important design feature. Some students did not read the question carefully and overlooked the section that required comment on the more traditional wheelbarrow.

Part b – Ergonomics

More than half of the students did not achieve full marks for this question because they did not make the distinction between ergonomics and safety features. Many students showed extensive knowledge of safety and how it relates to usage, but this was inappropriate in relation to ergonomics.

Question 3 – Australian Standards

This question related specifically to safety and although most students were aware of applicable safety standards some could not suggest what particular aspects of the wheelbarrow could be tested to ensure safe usage. As in the previous question many students confused ergonomics and safety.

Question 4 – Analysis of the brief/specifications

i. The design priority

Students achieved the highest marks on this specification. Most were able to identify a priority from the brief and to explain why it was important.

ii. The materials to be used

Students were expected to display their knowledge of their design area and to specify particular materials rather than material types, for example blackwood and aluminium rather than wood and metal. The justification needed to draw on their knowledge of the properties and characteristics of the particular materials.

iii. The function of the product

This question required students to give a specification related to the use of the end product. Food and fibres/fabrics students found most difficulty describing the function from their chosen design brief.

iv. Another consideration of your choosing

It was obvious that many students had studied previous examination papers as they were expecting a section on complex processes and used this specification to display their knowledge.

Question 5 – Criteria for evaluation

There was an increased understanding of how criteria can be identified from the specifications and developed into meaningful evaluation questions. The better evaluation criteria allowed scope for a discussion rather than a 'yes' or 'no' answer. Students were disadvantaged if they produced general questions such as 'Have I used the correct materials?', i.e. a question that is unable to be effectively evaluated and is of no use as a guide in designing.

Question 6 – Design options

Annotated design option 1

Many students did not annotate their designs and therefore limited their communication of design ideas. Students had to make sure that in addition to the processes, the priority, materials, function and chosen specification were mentioned. Sketches showed improvement especially by fibres/fabrics students; however, wood and metal options needed further improvement with clearer sketches, dimensions and colour.

Priority/function criteria justifications

Some students used the boxes for annotating their designs but this is not their intended use. Annotations were required only in the design option section. Many students did not clearly explain how the design addressed the priority and function criteria prepared in Question 5. Students needed to show how each criterion was addressed in the design option. Lists of design features were not enough to score full marks.

Annotated design option 2

An improvement was noted in the second design option with most students producing a viable second design that fulfilled the brief. In some cases the second option was an improvement on the first showing the development of ideas and a better understanding of a possible alternative solution to the brief. Time management still seemed to be a problem because many options were poorly sketched, hastily written and briefly annotated.

Priority/ function criteria justifications

These responses were poor and many explanations were identical to those of the first option.

Question 7 – Preferred design option

Many students did not identify the design priority. In most cases, students compared options rather than focusing on how the chosen option better addressed the previously chosen design priority. A comparison in relation to the design priority was needed to score full marks.

Question 8 – Modifications

It was obvious that many students had very limited knowledge of the correct names and properties of different materials. This made it difficult for many students to suggest appropriate substitutes and how such a change may impact on the final product.

Question 9 – Work plan

Major process

It was expected students would explain major processes. The processes had to be directly related to the chosen design option and involve a series of steps. Most students made an attempt at predicting time taken for each step and were reasonably accurate. Knowledge of appropriate tools, equipment and machinery was evident.

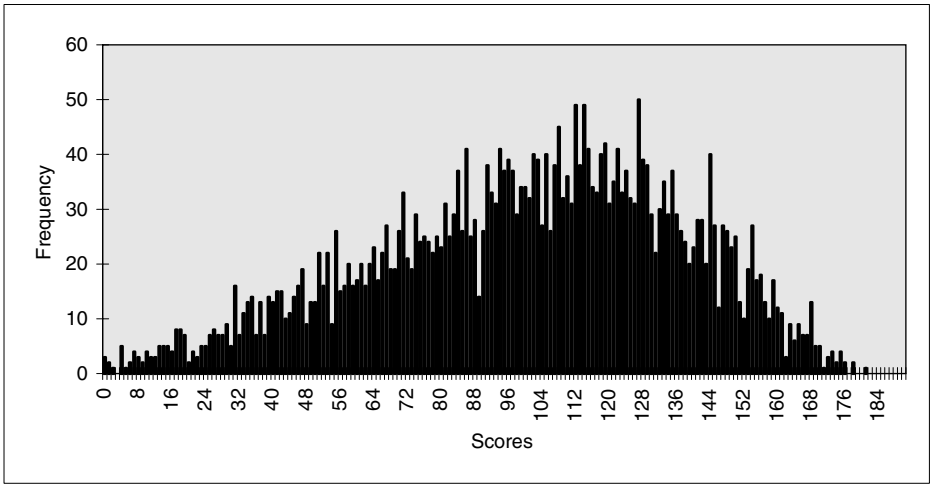
Quality of finish

This part was poorly answered. Many students were not aware that a quality finishing process is one that enhances the durability, feel and usually the appearance of the final product, for example burnishing metal, painting surfaces, invisible hemming, glazing and powder coating.

GA TD033 TECHNOLOGICAL DESIGN AND DEVELOPMENT WRITTEN EXAMINATION

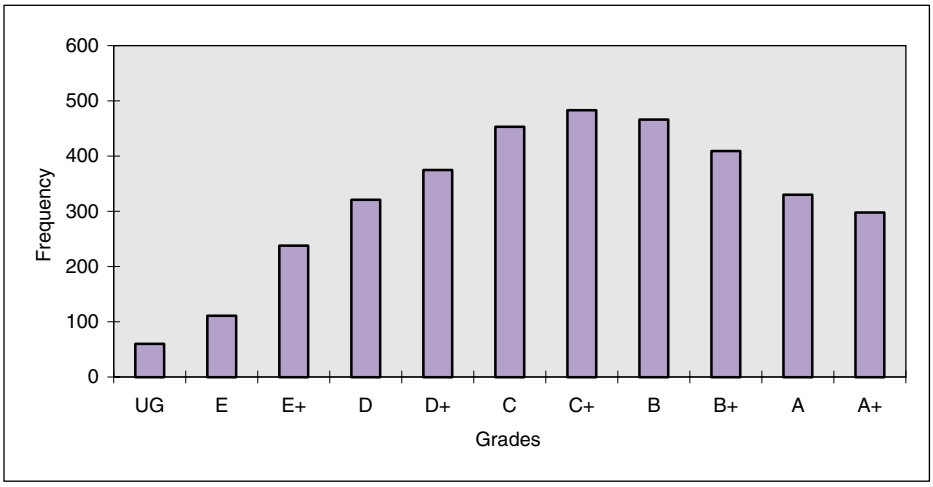
HISTOGRAM OF TOTAL SCORES 2000

Count 3544 Mean 100.16 Standard Deviation 36.66 NA Result 669



HISTOGRAM OF TOTAL GRADES 2000

Count 3544 Mean 5.84 Standard Deviation 2.57 NA Result 669



ENROLMENTS		%
Female	2344	55.6
Male	1869	44.4
Total	4213	

GLOSSARY OF TERMS

Count Number of students undertaking the assessment. This excludes those for whom NA was the result.

Mean This is the 'average' score; that is all scores totalled then divided by the 'Count'.

Standard Deviation This is a measure of how widely values are dispersed from the average value (the mean).

Notes

The ‘Report for Teachers’ series contains reports from Chief Assessors and State Reviewers for the Graded Assessments undertaken in 2000. Each report contains an overview of student performance, and provides comments on such matters as the assessment and the types of tasks undertaken.

It should be noted that these reports originate from work completed in 2000 and that changes may have been made to Study Designs and Assessment Guides since the completion of this publication.

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