Information Technology Studies

2005 ASSESSMENT REPORT

Technology Learning Area

SSABSA
SENIOR SECONDARY ASSESSMENT BOARD OF SOUTH AUSTRALIA

SACE
SOUTH AUSTRALIAN CERTIFICATE OF EDUCATION

INFORMATION TECHNOLOGY STUDIES

2005 ASSESSMENT REPORT

GENERAL COMMENTS

The examination provided students with the opportunity to demonstrate knowledge and understanding of the key concepts outlined in the curriculum statement. Students had the chance to show wider knowledge of issues in the structured response section. The setting panel limited scenarios to those with which students should be familiar. It is pleasing to note that this was a successful strategy, as there were few unanswered questions.

Slightly fewer students sat the exam this year than last year. In general, they seemed to be well prepared for the examination, and the mean result was significantly higher than previously.

The most common ways in which students' responses can still improve are:

- Students should use correct information technology terms in their answers. A vague answer that offers itself to several interpretations cannot be successful.
- Questions must be read carefully to ensure that students answer what is asked.
- Marks provide a guide to the number of points required for an answer. In questions requiring written responses, one key point equates to 1 mark.
- In most questions, students should apply general technical knowledge to a specific situation.
- Students must be familiar with such verbs as 'outline', 'describe', 'state' and 'explain' used in the exam. A SSABSA definition sheet entitled *Action verbs used in Intended Student Learning*, can be downloaded from <http://www.ssabsa.sa.edu.au/support/tech/2ity/documents/1itt-tl-001.pdf>.

ASSESSMENT COMPONENT 1: EXAMINATION

This report should be read while referring to a copy of the 2005 examination paper, which can be downloaded from the SSABSA website at <http://www.ssabsa.sa.edu.au/ex-2005.htm>.

PART A: SHORT-ANSWER QUESTIONS

Question 1

This question was very well answered with a mean mark of 4.55, with over a third receiving full marks. The most common errors were confusion of the definitions of module with algorithm, and information system with computer system.

Question 2

This question received a mean mark 4.04.

(a) Students generally identified advantages successfully.

(b) Successful students realised that the information required was two linking fields in a transaction table.

(c) The most common error was not to identify characteristics of the input device that were advantageous in the given situation. Instead, some repeated data characteristics.

Question 3

The mean mark for this question was 4.24.

(a) Most students identified the three types of address successfully.

(b) Successful answers correctly identified the domain, top level domain (type of organisation) and country code.

Question 4

Successful answers applied correct terms to the given scenario. Mean mark was 3.88.

(a) Few achieved full marks for this section. Successful students realised that node is a general term for any network component with an identifying address.

(b) Successful students understood the implication of the word ‘geographical’.

(c) Successful answers identified the client–server relationship. Poor answers cited proprietary operating system limitations.

(d) Popular answers included Network Interface Card and transmission media. Communications software or the use of a common network protocol were answers from the best students.

Question 5

The mean for this question was 3.22.

(a) The concept being tested was that of the algorithm generating an output from the system to a screen. Successful answers included key words such as DISPLAY, or PRINT. Some answers used the word INPUT, which is language specific rather than pseudocode.

(b) Once again, words demonstrating an understanding of the key concept were required, in this case, Loop, iteration, or repetition.

(c) The most common error, an answer of 100, was avoided by reading the code carefully.

(d) Successful answers used correct mathematical syntax, and included the key word, AND.

(e) Generally well answered.

Question 6

This was the least well-answered question in the exam, with a mean mark of only 2.43. A number omitted this question completely. Successful students applied knowledge from the Individual Project.

(a) The determination of required outcomes of the system was rarely mentioned.

(b) The need to plan tables and relationships was generally understood, though often poorly expressed.

(c) The worst answered section: answers often confused development with implementation issues.

Question 7

This question had a mean mark of 5.98.

(a) Many answers concentrated on effects of viruses, rather than the definition of a virus.

(b) This was generally well done.

(c) Virus types were accepted as names as long as there was no confusion about their effects. Successful answers indicated knowledge of how viruses could affect a system, rather than just ‘crash the computer’.

(d) A significant number of students confused the required ‘infect’ with ‘affect’.

(e) Successful answers referred to the practices of individuals (such as not opening email attachments), rather than those a company would undertake (e.g. installing a firewall).

Question 8

The mean mark was 3.29. Successful students were able to be precise in their terms.

(a) General purpose was commonly well defined, but special purpose software was poorly answered. Successful answers identified that special purpose software was written for a specific user, rather than discussing tasks performed. Many students gave examples (such as a graphic design program) that showed their understanding was incorrect.

(b) A number of answers indicated specific teaching of this section is required.

(c) In general, this was better answered than in previous years. Successful answers related the component to the process actually happening.

Question 9

With a mean of 2.57, this was the second most poorly answered question. Successful students demonstrated knowledge of the basic concepts of databases, and ability to problem solve. A significant number of students did not appear to understand the resolution of many to many relationships with a transaction table.

(a) This is a fundamental concept that underpins the Individual Project, so it was disappointing to see a significant minority of incorrect answers. A common error was to say there was no relationship, as there was no link drawn on the question sheet.

(b) The correct dual field key was identified reasonably well. A few used a triple key.

(c) Successful students were able to identify correct records that should have values, and the values that should be in them.

(d) Overall, well answered. Mathematical conventions and terms needed to be correct. Correct table and field names should have been used.

PART B SECTION 1: EXTENDED-RESPONSE QUESTIONS

Question 10

This question received a mean mark of 9.52, above the mean mark for the whole examination—a pleasing improvement.

(a) This question tended to be answered either very well or very badly, with far more successful students than otherwise. The most common error was to omit the conversion of bits to bytes (÷8), followed by the failure to recognise the number of pixels in a picture was a product of its length and width. Gradually the number of students who insist that kilo in IT is 1000 (rather than the correct answer of 1024) is becoming very small.

(b) Calculations were derived from answers in part A, and were generally correct.

(c) Answers needed to relate the characteristics of flash memory to its use in cameras. Successful answers used appropriate terms which were related to the situation.

(d) This section had fewer blank answers than in previous papers. However, many answers showed a confusion of the purposes of RAM and registers. More specific teaching is required here. The ALU part was generally answered well.

(e) Most answers did not attempt to justify their storage. Inappropriate suggestions for storage, such as flash drive or floppy, were in the minority. Good answers included a calculation of the storage required. Frequency of backup was often ignored.

Question 11

With a mean of 7.87, this was the least well-answered question in Part B.

(a) Most students identified the hardware correctly, though some revealed a lack of careful reading by omitting 'wireless'. The function of the hardware was less well answered: too many answers were too general (i.e. 'to connect to the network', already a given), rather than focusing on the technical functions such as storing network identity.

(b) Successful students understood that the word 'outline' requires more than a one-word answer. Portability and lack of cabling were the most commonly stated advantages, while disadvantages were more varied.

(c) Successful answers gave more than the general 'connect to the network', explaining the functions of the protocol. Two functions were required for two marks.

(d) Generally well done.

(e) There was confusion between the functions of a proxy server, and a firewall. The former were required. Successful answers had brief explanations using appropriate terms.

(f) The question required a suggestion and explanation. The suggestion was frequently correct, but the explanation often was not. Successful answers avoided repeating the question, using correct terms to explain how the suggested method works.

(g) Specific teaching of the concept of a utility program seems to be required. Many answers confused this concept with application software, such as media player.

Question 12

This question had a mean of 8.97.

(a) In general, this question was answered successfully. Poorer answers tended to confuse the direction of the one to many relationship.

(b) Generally successfully answered.

(c) Successful students referred to the possibility of two classes, but many incorrectly discussed students in the classes.

(d) Successful answers referred to the need to prevent an enrolment being stored twice, and correctly identified the dual key, using the extra field they had inserted in part (a). Poorer students demonstrated that they did not understand the use of a dual key, and either tended to insert an enrolment ID field, or were unable to make any suggestion.

(e) Generally successfully answered. Most saw the need for a new Teachers table and correctly linked it with the Classes table. A large minority of weaker responses had a link to the Subjects table, while a few included an extra transaction table.

(f) Structured query answers are improving. More were correct, and fewer were blank.

(g) The data flow diagram was generally successfully completed. There is still a tendency for a minority of weaker students to write data values on the flow lines, rather than field names. Only a few students wrote table names in the wrong order.

Question 13

The mean mark of 8.8 continues an upward trend in answers on this section of the course.

(a) The desk check was generally handled successfully. The students who followed the modular desk check correctly noted changes of values to variables, and gave the correct

output. Weaker students did not discriminate between relevant and irrelevant data, tending to write in everything and not follow the code.

(b) Modules were in general successfully identified and placed in the structure chart according to conventions. The loop control structure was less well handled than the selection, while there is still a need for more teaching of the concepts underlying flow of data. Although there has been an improvement, few students were fully successful.

(c) This section had a very high percentage of successful answers.

(d) Students were either totally correct, or totally unsuccessful for this section. This question tested a basic concept of programming, clearly outlined in the document *Standards for Information Systems Design Tools* available at <http://www.ssabsa.sa.edu.au/support/tech/2ity/documents/2ity-tl-005.pdf>. Successful students often chose an appropriate variable name.

(e) A variety of successful solutions were proposed for this question. These students recognised the need for a selection statement, and correctly used its syntax.

PART B SECTION 2: STRUCTURED-RESPONSE QUESTIONS

Successful structured responses continue to be fluent, well constructed, and cover most of the points, although there is a tendency to state opinions as fact. Introductions still tend to be a problem, either being too long and beginning to answer the question, or non-existent. One or two sentences are the optimum, as in the conclusion, which should not contain new material.

It is important that teachers emphasise the structural requirements of these questions; the outlines provided are intended to be used by students as a planning guide.

Successful answers tend to be less general in comments, more technically specific, and include more detailed examples directly related to the scenario given in the question.

Question 14

Around 30 per cent of students answered this question, with a mean mark of 18.03.

In general, students successfully identified hardware and software needs of the network, as well as mediums of communication between the nodes. However, the type of data to be stored, linking, and the flow of data to achieve a specified outcome were often not successfully identified or discussed. The storage medium for the card was successfully identified, but not what was stored on it. In general, advantages were successfully outlined.

Question 15

Chosen by around 60 per cent of students, this question had a mean result of 18.88.

Successful answers demonstrated a sound understanding of the issues surrounding malware. Better responses included an abundance of information that was relevant to the family scenario, including impact on the family. Weaker students saw the word virus, and often spent some time on that irrelevancy, rather than the specified adware and spyware. These responses also tended to be repetitive, and not clearly distinguish between spyware and adware. Too much emphasis was placed on hackers, rather than the more common ways in which malware arrives.

Question 16

Only 10 per cent of students attempted this option, achieving a mean of 17.75. This made it the least successful of the structured response questions, which is disappointing as this question is similar to the implementation issues section of the major project. More specific teaching may be necessary.

In general, responses did not handle data management issues successfully, nor methods of testing the program. The use of the Internet was discussed more successfully, though weaker students thought the site was public, rather than being reserved for doctors. Many answers displayed a lack of understanding of sources of error and access issues.

ASSESSMENT COMPONENT 2: INDIVIDUAL PROJECT

The Moderation Panel was pleased with the level of expertise shown by most projects, both in the development of the database, and in documentation of the process. However, the panel wishes to stress the importance of teachers and students following the *procedural notes, notes on the Systems Development Life Cycle, and Individual Project marks scheme* that are stored on the SSABSA website at <http://www.ssabsa.sa.edu.au/support/tech/2ity/documents/2ity-tl-004-000.pdf>. In particular, teachers should check and approve students' individual projects, and especially that the outcomes are based on the transaction table.

Students should include documentation that helps a user to enter meaningful data, and teachers should justify their marks by the use of comments on the SSABSA-provided marks scheme. Teachers are referred to the comments in last year's report on the use of skills checklists.

Students who achieved excellent results for their project were able to demonstrate efficient use of tables. It was notable that many successful students chose a simpler database design so that they could concentrate on correct design and development of tables, relationships and outcomes. Successful projects also were notable for inclusion of relevant documentation, and comment, rather than pages of irrelevant data. Poorer projects revealed a lack of understanding of the use of a master query and highlighted fields to validate the flow of data. In these projects, data flow diagrams were rarely well done, though overall there was a pleasing improvement in data flow diagram accuracy. The document *Standards for Information System Design Tools* found at <http://www.ssabsa.sa.edu.au/support/tech/2ity/documents/2ity-tl-005.pdf> outlines standards for representing data flow diagrams. Some projects still did not refer explicitly enough to the scenario in their discussion of implementation issues.

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