

Information Technology Studies

2 0 0 3 A S S E S S M E N T R E P O R T

Technology Learning Area

SSABSA
SENIOR SECONDARY ASSESSMENT
BOARD OF SOUTH AUSTRALIA

SACE
SOUTH AUSTRALIAN
CERTIFICATE OF
EDUCATION

INFORMATION TECHNOLOGY STUDIES

2003 ASSESSMENT REPORT

GENERAL COMMENTS

Although there were fewer candidates than last year, they were generally well prepared for the examination, as the average examination mark was once again slightly higher than in previous years. Students who achieved high marks focused on the terms used in the questions such as 'explain', 'describe', and 'outline' to write accurate and relevant responses. A noted improvement was the quality of the structured responses, which had an average mark of 62%. Markers commented, however, that some questions were answered with a lack of detail.

The Moderation Panel was pleased with the quality of individual projects submitted by the students. They stress the importance of the teacher approving the project and making sure that the students submit all of the required documentation. It is imperative that teachers use the mark scheme as published on the SSABSA web site.

ASSESSMENT COMPONENT 1: EXAMINATION

PART A: Short Answer Questions

1. This question was very well answered. It had a mean mark of 4.6, with 95% of the candidates achieving at least half marks. The two most common errors related to parts (d) in which students responded with terms G (Network Administrator), and (e) with responses of E (Evaluation) or K (Objective).
2. Good answers to this question identified whether the modification being suggested was hardware or software and explained in detail how it would benefit the person. Makers reported that there were a lot of superficial answers such as 'the user speaks into a microphone and the software follows the instructions'. This question had a mean mark of 2.2.
3. Only a small number of candidates clearly understood the types of programming errors and even fewer could accurately state the impact they have upon the running of a program. More successful students stated whether the error would allow to the program to run or not and what happens when the error is encountered. The mean mark was 2.5, with 56% of students achieving less than half marks.
4. Less than 4% of the students achieved at least 4 marks in this question, which had a mean mark of 1.6. A common error in part (a) was to describe a feature of a browser (such as bookmarks) as opposed to the world wide web (hyperlinks). Good answers to part (b) clearly stated that images displayed on a web page are stored in a separate file and downloaded from the remote web site due to a HTML command stored within the source code of the web page. In part (c), some students were not familiar with the term 'Internet service'. Those that were answered this part very well.
5. The results for this question were normally distributed about a mean of 6.6. It is important that students read questions of this type very carefully and make sure they do what the question asks them to do.
 - (a) Was answered quite well, but the reason some students provided did not support the relationship they indicated existed between the tables.

- (b) This required students to realise that cars get repaired not customers; hence the link between Customer and Repair table was not needed.
 - (c) Was answered fairly well. Not many students were familiar with the database design principles (normalisation key concept) as stated in the curriculum statement, hence the responses to the next part were often incorrect.
 - (d) These answers were often incorrect.
 - (e) This question was answered very well, with most students able to describe the required calculation.
 - (f) There was a marked improvement to the answers in this part with a lot more students able to accurately state the impact of a key that consists of multiple fields on a database.
6. Responses to this question ranged from poor to excellent. The better responses to part (a) clearly stated the type of backup that should be performed, when it should be done, who should do it, what type of media to use and where the media should be stored. A number of students misread part (b) and described how a brand new database can be developed, rather than focusing upon the recovery of the existing database by reinstalling the database software, then restoring the data from the backup media. This question had a mean of 2.4 marks.
7. The mean mark for this question was 3.1 with nearly 80% of candidates scoring half marks or more. Parts (a) and (b) were answered very well. A common error in part (c) was to state a general characteristic of a storage device such as its shape, rather than a storage characteristic such as its capacity. This reinforces the fact that students need to read questions very carefully.
8. Whilst most students had a good understanding of the terms in part (a), they often did not properly distinguish between them. The more successful students clearly stated two differences between them, such as access to data, and who can access it. Many answers to part (b) were very general. There was a tendency in part (c) answers for some students to confuse the role of a proxy server with that of a firewall. Good answers to this part correctly addressed the issues of file caching or filtering undesirable internet addresses. The question's mean was 1.9.
9. Only 3% of students did not attempt this question. Of those that did almost 20% correctly completed the desk check. On the other hand, nearly 40% of students scored at most 1 mark. Markers reported that it was obvious which students followed the instructions in the algorithm by inspecting the values in the 'number', 'x' and 'y' columns in the table.

PART B – SECTION 1: Extended Response Questions

10. This question was generally well answered, with a mean mark of 8.3.
- (a) The most common error in this part was in sub-part (ii) as this was to suggest two output devices, rather than two outputs of the data-matching process.
 - (b) Most students clearly stated correct answers to this part as their answers honed in on the use of biometric data.
 - (c) Most students clearly stated correct answers to this part as their answers and honed in on the use of biometric data.
 - (d) This part was well answered with many students correctly stating that the potential for data being changed by hackers was a disadvantage.
 - (e) Students who carefully read this part recognised that random access memory requires a constant supply of electricity to maintain its contents, hence read-only memory would best suit the ID chip.

- (f) The calculation in this part was very well done, with many students scoring full marks. Only a handful of students are still incorrectly converting bytes to kilobytes by dividing by 1000. It is expected that students know that there are 1024 bytes in a kilobyte – and 8 bits in a byte.
 - (g) This question tested the student’s knowledge of types of software, with a reasonable number of candidates correctly identifying file compression software, although not as many could outline how it works.
 - (h) The responses to this question needed to explain how the parts of the CPU work as the two sets of biometric data were compared. The results indicate that many students find this difficult to do, as some wrote general explanations.
 - (i) This part was answered correctly by only a small number of students. Those that stopped and thought about the context correctly stated that the ID chip contains just data and that as the reader just reads the data it does not execute instructions stored on the chip, so it was not possible for a virus to infect the computer system.
11. Answers to this question varied. Students who were familiar with modular algorithms and drawing structure charts did quite well. The mean mark for this question was 8.6.
- (a) Good answers to this part stated the need to retest the stopping condition of the WHILE loop.
 - (b) The responses to this part were quite good.
 - (c) Most students answered this question quite well, although the weaker students had trouble classifying the ‘match’ variable.
 - (d) Responses to this question were varied. Some students had no idea and re-wrote the algorithm in boxes. Teachers and students must consult the document ‘Standards for Information System Design Tools’ from the SSABSA web site that defines the way structure charts are drawn. Only the better students were able to complete the data flow for the ‘wanted’ variable.
 - (e) Responses also varied a lot. Many students realised that an ‘IF’ statement was needed, but only the more successful students could correctly identify the two conditions and tie them together with a logical ‘or’ operator.
 - (f) Was answered well by some students.
 - (g) Relatively few students could clearly explain the impact of the statement in this part upon the algorithm, but those that did, did well.
 - (h) Parts (h) and (i) were not answered well.
12. Whilst the modal mark for this question was 10, the mean mark was 7.9. Not one candidate scored full marks for this question.
- (a) This was answered well, with most students correctly using the terms WAN and client-server.
 - (b) The responses to this part lacked depth and detail, with the standard answer addressing just the log-in process. The better responses also discussed access rights to the database.
 - (c) Many students did not know the differences between the methods of transmission in this part, with quite a few of them confusing the two methods. The more successful students wrote precise and non-repetitive answers.
 - (d) This part enabled most students to successfully demonstrate their understanding of the composition of a data packet, and how they are transmitted via packet-switching.
 - (e) Many students did not read this question carefully enough and in sub-part (ii) just re-phrased the question. The better responses stated that a firewall can prevent unauthorised access by packet filtering.
 - (f) Most students were able to correctly identify the meaning of the parts of the URL in this part.

13. The marks for this question were almost normally distributed about a mean of 10.2 marks.
- (a) This question was answered reasonably well. The better responses described both parts of the relationship – that is people can go on many trips and a trip can contain many people. The poorer answers often stated just ‘many people can go on many trips’.
 - (b) The responses to this part varied. The more successful students created a new field in the People table as the key for that table and underlined Trip ID as the key to the Trip table. Both of these fields, together with date, were added to the Arrivals table. The weaker students did not set correctly the relationships for sub-part (iv) and often did not give a proper reason to justify their choice of a key.
 - (c) This was not done very well at all. The keener students recognised the purpose of the Carrier table and adapted its structure to answer this part.
 - (d) The answers varied, with some perceptive responses noted.
 - (e) The responses were quite good, with many students correctly completing the diagram. The weaker students tended to write data values on the flow lines, rather than field names as asked by the question.

PART B – SECTION 2: STRUCTURED RESPONSE

The average marks for this section of the examination increased by 8% this year to 62%. Whilst the structured responses written by students have obviously improved, it must be noted that there were not as many outstanding responses. A number of students wrote their responses as a series of dot points, which reduces their mark in terms of writing a clear, well-expressed answer. Students who wrote in continuous prose, with a brief introduction and conclusion, and included opinions and examples were rewarded appropriately.

14. Just over a quarter of the candidates answered this question, which had a mean score of 17.7. Most students were able to explain the reasons why a wireless system could process data faster than a manual system. The better answers included reference to processing speed and accuracy in addition to data capture. A lack of detail was typical in discussions of the type of network, as most students only acknowledged a client-server local area network. The more successful students described the types of nodes that would be needed and hinted that the restaurant could be part of a wide area network. Most students wrote good answers about the flow of data, mentioning that a central server computer using a database would calculate a customer’s bill based upon their orders as stored in the database. Only the better students were able to fully discuss the implications of tracking performance in terms of how it could affect the staff, the customers and the management. Whilst most students described some of the advantages of a wireless system, not many of them wrote enough detail.
15. This question had the highest mean in this section – 20.3 and was answered by just under a quarter of the candidates.

Nearly all students stated two methods that can be used to digitise photographs, but only the better students discussed them – that is, gave a range of arguments for each method. The storage devices that could store digital photographs were generally well described, with the more successful students providing clear reasons for the most appropriate device. Most students had a good general understanding of how to store digital photographs on a web site, but the weaker students did not include all the necessary details. The advantages and disadvantages of storing digital photographs on a web site reveal a sound understanding of the nature of the internet and the potential

to misuse globally accessible data. The last point about protecting digital data was not covered as well as was expected.

16. Almost half of the candidates answered this question, which had a mean mark of 17.9. This suggests that many students are familiar with email. The markers were surprised that many of the students could not clearly explain specific details of how an email could slow down the operation of a network and even destroy data.

Students answered the first part of this question well, being critically aware of the reasons for the widespread use of email in a business context. Only a small number of students mentioned that an email worm could cause a network to be slowed down by overloading the network's mail server. The most common answer related to an increase in email traffic caused by downloading large attachments. A few students stated 'an email by itself cannot destroy data' whereas most students discussed how an attachment that had been infected with a virus could destroy data. However, they often did not specifically state how this could happen. Students are generally very aware of the procedures that can be used to prevent damage caused by an email. This part was discussed very well. Not many students discussed the psychological implications of emails that caused damage, and whilst most acknowledged the economic implications, the depth of discussion was often only superficial.

INDIVIDUAL PROJECT

The individual projects submitted by most students were well documented and produced outcomes that met the course requirements. The moderation panel was concerned that a number of student projects were awarded full marks when they did not work properly. Teachers are encouraged to fully test their students' databases by entering a variety of test data when marking the projects.

The skills demonstrated by students improves each year, with some complex and professionally produced information systems created this year, especially by those who used FileMaker Pro to write scripts. The panel was pleased that most teachers used the current mark scheme to assess their students' work. Teachers who are unsure of the marking standard in this project are encouraged to visit the end of year moderation, or attend a project workshop at SSABSA.

COURSE WORK

As the course work is statistically moderated against the examination, it is important that teachers set assessment tasks that enable them to accurately rank the students in their class. Students must be given practice at writing essays on current information technology issues. Their essays must include a brief introduction, examples to support their answer, an opinion that can be justified with facts, a sense of logical connection between the dot points stated with the topic, and a conclusion that summarises the essay.

Students need to be prepared for the examination by setting them questions that require them to apply their knowledge to different contexts, rather than just factual recall. In addition, students need to be able to solve problems such as drawing a data flow diagram from a given table relationship diagram, desk-check a given modular algorithm, draw a structure chart showing data flow, and solve database relationships.

Chief Examiner
Information Technology Studies