VICTORIAN CURRICULUM AND ASSESSMENT AUTHORITY

2003 Information Systems GA 3: Written examination

GENERAL COMMENTS

The structure of the 2003 paper differed from those of previous years. The paper was comprised of Section A – Short-answer Questions and Section B – Case Study; the maximum score was 100 (Section A – 25 marks, Section B – 75 marks).

Section A required students to demonstrate core theoretical knowledge without the need to relate their responses to an extended case study. Answers needed to be concise, direct and accurate to obtain marks. Many students found this section difficult, with a mean score of 14.75. Teachers are encouraged to prepare students by providing examples of this style of question throughout the year. It is important that students supply answers that clearly show their knowledge of information technology terms and concepts; marks are easily lost when a 1-mark question does not show clear understanding.

Section B was similar to previous examinations with students generally performing well. It is important to stress that **all questions in Section B related directly to the case study provided**. This has been the case in previous years. Teachers are strongly encouraged to advise students to answer ALL questions in Section B with specific reference to the case study. Students who did not do this were unable to gain full or in some cases any marks for questions in this section.

SPECIFIC INFORMATION

Section A

Question 1

Marks	0	1	Average
%	38	62	**0.62**

Students had to provide a one-word response to demonstrate their knowledge of the logical design of a system using data flow diagrams (DFD). Students should be able to use the key words associated with DFDs, namely entity, process, data flow. The response required understanding that 'processes' are actions performed on data.

Question 2

Marks	0	1	2	3	Average
%	16	16	19	49	**2.01**

The Systems Development Life Cycle (SDLC) is a key element that runs through the Information Systems study design. It is expected that all students should be able to name the five stages as listed in the study design: Analysis, Design, Development, Implementation and Evaluation. Even though the SDLC may be represented differently in IT literature it is important for teachers to note that the definition provided in the study design is the one that is used by the examination setting panel and assessors. Students generally answered this question well, showing that they were aware of the stages providing Evaluation, Analysis and Implementation as the correct responses. However, a number of students confused stages of software development, such as testing, with SDLC stages.

Question 3

Marks	0	1	Average
%	25	75	**0.75**

Students were expected to provide a statement that clearly articulated the difference between a LAN and a WAN. Most students, however, simply wrote a definition of both terms. The 1 mark was awarded if the definition clearly stated that the key difference was the 'geographic area' the network covered. If students responded with 'local is in one building' and 'wide is over a number of buildings' this was insufficient to receive the mark.

Question 4

Marks	0	1	Average
%	48	52	**0.52**

Students needed to clearly show their understanding of networking and IP addressing, and that an IP address 'uniquely identifies a computer or device on a TCP/IP network'. A number of students talked about connecting to the Internet, clearly confusing network and the Internet.

Question 5

Marks	0	1	Average
%	53	47	**0.47**

Over half the students attempting the paper were unable to express a clear direct response to this question. An acceptable response indicated 'files are stored (and accessed) one after another'. Using the word 'sequence' in the response did not show adequate understanding.

Question 6a–b

Marks	0	1	2	Average
%	56	15	29	**0.73**

Students had difficulty interpreting the NS diagram. Teachers should ensure that students are able to read and interpret flowcharts, pseudocode and Nassi-Schneiderman algorithmic methods as stated in the study design.

Question 7

Marks	0	1	Average
%	81	19	**0.19**

This question was poorly done with only most students not able to identify the data structure as an array. Many incorrectly answered string or text, indicating they had limited knowledge of variable types and data structures.

Question 8

Marks	0	1	Average
%	36	64	**0.64**

This question asked students to state the function of a network card. Many misinterpreted the question and thought they needed to explain the transfer rate of the card. Students need to understand what is being asked by the term *function*. The study design states 'Function – the tasks performed by information system components'. Students need to carefully analyse each question.

Question 9

Marks	0	1	2	Average
%	17	47	36	**1.18**

Students needed to select the USB cable and explain that it would allow faster data transfer for larger files, i.e. the photos from the camera. To simply state 'USB' was not sufficient to gain full marks.

Question 10i–iii

Marks	0	1	2	3	Average
%	6	5	31	58	**2.40**

Students found this straightforward; it was very much a fact recall question. Students were able to show that they understood that fibre-optic cable was faster, covered greater distances and was more expensive then UTP.

Question 11a–b

Marks	0	1	2	Average
%	51	6	43	**0.91**

It was clear from the responses that project management principles had not been covered in all classes. With such a large percentage of students getting zero this is clearly an area that teachers will need to address in more depth. Acceptable answers included PERT and Gantt charts and an explanation that could have included the following uses: indicates tasks, length or time, dependencies, resources, critical path, length of project. Some students responded with software tools such as Excel and MS Project. These were accepted if the students provided an explanation indicating they would use them to create a Gantt or PERT chart. Many students inappropriately answered with Analysis and Design tools such as DFD, Structure charts etc.

Question 12

Marks	0	1	2	3	Average
%	5	20	44	31	**2.00**

Generally, students were able to address the issues identified by the small case study provided. Students were expected to address three issues to receive full marks and cover both viewpoints. Acceptable responses included discussion of copyright, piracy, costs, and ethical obligations.

Question 13

Marks	0	1	2	Average
%	37	26	37	**1.00**

It was clear from students' responses that many knew the difference between a switching hub and a non-switching hub. However, many students were unable to clearly express this understanding with numerous vague and indirect answers.

There was also a group of students who clearly did not understand the technology – describing a switching hub in literal terms, that is, a component to switch something on and off. Acceptable answers indicated that a switching hub (a switch) directs network data to right location where a non-switching hub broadcasts to all connected segments with data it receives.

Question 14

Marks	0	1	2	Average
%	19	25	56	**1.37**

Most students were able to show their understanding of changeover methods. Students were expected to write two comments about parallel changeover. An acceptable answer included; the new and old system ran at the same time (1 mark) and an additional comment such as costly approach, duplication of procedures, slow changeover, ideal of reluctant staff (1 mark).

Section B

Question 1

Marks	0	1	2	3	4	Average
%	11	9	22	33	25	**2.52**

Most students were able to diagrammatically represent a network; however, common errors included connecting more then eight devices to the 8-port hub, connecting both printers and scanner to the one PC, omitting the fileserver or Internet connection.

Question 2

Marks	0	1	2	3	4	5	6	7	8	Average
%	7	2	4	6	12	12	18	14	25	**5.42**

The question was reasonably well answered, with students able to identify the relevant components from the case study. However, if students did not relate their answers to the case study they lost marks. The question clearly asked students to relate their responses to the new website. Acceptable responses included:

- 32 MB RAM – too slow to handle all the tasks especially real-time video feeds
- Server speed 400MHz – too slow to keep up with the demands of users of the website
- 2GB Hard Drive – not large enough to store all the data which included video, photos, database etc. for the website
- ISDN bandwidth 64K – capacity insufficient for the expected 1 000 000 hits per day.

Unacceptable responses included items not in the existing system.

Question 3

Marks	0	1	2	3	4	5	6	7	Average
%	6	2	14	1	6	7	15	49	**5.27**

This question was one of the better answered questions. A small number of students had little idea of context diagrams and found it difficult even to identify the external entities that were highlighted in the question.

Question 4

Marks	0	1	2	3	4	5	6	Average
%	6	3	22	8	49	5	7	**3.33**

Expected responses to this question included

When Last Drug Test taken	Date	The system must record the DATE of the test
Mobile Phone Number	Text – 12 Characters	Number fields do not accept hyphens and blanks as indicated in the expected format
History	Memo	Storing players' highlights and achievements, which could be 1–3 paragraphs, is longer than a text field allows.

Most students got two of the three data types correct. However, many indicated that the mobile phone number should be a number field rather than text and very few indicated that it should be 12 characters in length. The question stated that any restrictions should be stated where appropriate. Students needed to carefully read the question, so many missed this additional requirement rather than answered incorrectly.

Question 5

a

Marks	0	1	2	3	4	5	6	7	8	9	10	11	12	Average
%	31	3	7	8	9	8	11	6	6	6	2	1	2	**3.79**

This question was answer particularly poorly. The question asked students to develop four tests using **only user codes made up of two digits and three alphabetic letters**. Many students missed this in the question and tested any number of combinations of numbers and letters. Students also incorrectly assumed that the expected and actual results were the same without testing the algorithm. If they had tested it correctly they would have been able to identify the errors for

part b. Students were expected to test the boundary condition of the range check in the algorithm, which also could have been ascertained from the table provided in the case study.

Acceptable tests include:

Test No	Test data	Expected Results	Actual Results
1	10ABC	Invalid user message	ValidUserCode is set to true, no message is displayed
2	11ABC	Code is validated	ValidUserCode is set to true, no message is displayed
3	26ABC	Code is validated	ValidUserCode is set to true, no message is displayed
4	27ABC	Invalid user message	ValidUserCode is set to true, no message is displayed

bi–ii

Marks	**0**	**1**	**2**	**3**	**4**	**Average**
%	47	6	35	2	10	**1.22**

Many students either did not do this part or gained no marks for their response, as they failed to identify either of the errors in the algorithm. Students were expected to correctly identify that the range check was incorrect and should have read *if country >=11 AND country <= 26 then*. The second error was more difficult for students to identify if they could not adequately test the algorithm. The line *ValidUserCode ← True (after If Letters are Alphabetic Then)* should in fact be removed.

Question 6

Marks	**0**	**1**	**2**	**3**	**4**	**Average**
%	36	26	21	12	5	**1.24**

Most answers provided for this question did not link to the case study. The question clearly asked students to address the disadvantages and advantages **at the World Cup**. Many students responded with well thought out responses, but did not mention any link to the World Cup. This meant they could not be awarded marks.

Acceptable answers included:
Advantages

- access to the network wherever it is convenient at the stadium – more flexible
- reduction in cabling costs especially as the system is only going to be needed for the World Cup
- will be able to be used again at another site after World Cup finished
- reduction in costs of providing network access points at the stadium.

Disadvantages

- not always reliable, which is a necessity for World Cup event
- slower than a network running fibre optic cable, especially if there is heavy traffic such as the photo/video files sent from the photographers
- not as secure as fixed wired networks so results may be tampered with during the World Cup.

Question 7

a

Marks	**0**	**1**	**Average**
%	32	68	**0.68**

This question was generally well done with students able to identify that it was the data transfer rate that was being tested or that they were doing load/stress testing.

b

Marks	**0**	**1**	**2**	**Average**
%	16	51	33	**1.17**

This question required students to describe how the test results would be used. It was expected that students talk about the ability to **compare** results to identify the 'best' notebook for the World Cup. The link to the case study was a vital element within the response. It was insufficient to simply state 'it would find the best notebook'.

c

Marks	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**Average**
%	23	5	21	16	18	8	9	**2.59**

Students found this question challenging. It required hardware-based tests, with which many seemed unfamiliar. The desirable outcome needed to be linked to the case study, and this was rarely done in this question. Teachers are urged to include more of this type of question in the course and during revision.

Acceptable responses included:

Proposed test	Equipment tested	Desirable outcome
Battery Life - leave the notebook on and perform a range of tasks as expected at the World Cup such as data transfer.	Battery	That the battery lasts for as long as would be required for World Cup events.
Range of Wireless Network Card – log into wireless network and move slowly away until it loses connection with the network.	Wireless Network Card	To have the longest distance available at the World Cup between access points to reduce cost of infrastructure.

Question 8

Marks	0	1	2	3	4	5	6	Average
%	27	4	27	4	24	2	12	**2.47**

Those students who read the question carefully provided good sound responses that indicated an adequate knowledge of wireless networking. However, many students did not describe components that would be 'required' in a wireless environment. Others listed and described components from the table provided.

Acceptable responses included:

- **wireless networking card** for the notebooks. These allow the notebooks to be connected to the network as long as they are within the range of the wireless transmitter (note: it was not acceptable to simply write a network card without indicating it should be for a wireless network)
- **wireless networking card drivers** for the notebooks and fileserver installing the wireless network cards without the appropriate software drivers will mean the notebooks and server cannot communicate
- **access points** – located within 50 m around each of the venues so that data can then be transmitted from the notebooks to the on-site network server.

Question 9

Marks	0	1	2	3	Average
%	17	24	31	28	**1.70**

Most students were able to adequately describe the process of encryption; however, teachers should encourage students to use the correct IT terms and link the response to the case study. An acceptable response identified that the data will be encrypted with a key, sent from the host country to Melbourne where a key is used to decrypt the data. This algorithm allows security. For example, the journalists will need to use their encryption key so that anyone intercepting it as it travels to Melbourne will not be able to read it. The only people that will be able to read it are those in Melbourne who have the matching decryption key.

Question 10

Marks	0	1	2	3	4	5	6	Average
%	7	5	13	23	20	9	23	**3.62**

This question asked students to display their knowledge of the technical, operational and economic criteria (factors) for evaluating the feasibility of alternative design options. Some students misread the question and compared the two options provided. This resulted in zero marks being awarded. Many students were able to identify the factors such as cost, compatibility, security, however they had difficulty expanding on those factors and linking them to the case study.

Question 11

Marks	0	1	2	3	4	5	6	Average
%	57	13	9	8	5	3	5	**1.18**

This was one of the most poorly answered questions on the paper. Students were unable to accurately articulate the type of documentation provided. Simply stating technical or user documentation was not sufficient; answers needed to address the content of that technical documentation. Acceptable responses included a technical manual on the information system at Headquarters or on the system hardware or on the LAN or a user manual for the uploading and downloading of photos. A number of students incorrectly wrote topics that should be included in the documentation such as 'How to download a photo'; this is also incorrect.