



2005 Information Systems GA 3: Written examination

GENERAL COMMENTS

The structure of the 2005 paper was the same as in 2004; Section A comprised of short-answer questions and Section B consisted of a case study. The maximum score was 100, with Section A worth 25 marks and Section B worth 75 marks.

As with previous years, Section A required students to demonstrate core theoretical knowledge; however, the mean score this year of 14.81 was lower than last year. This was disappointing as students should now be familiar with this style of questioning. It is important that teachers use this questioning style during the course of the year. Students should be aware that only clear, complete responses are awarded full marks. For example, in Section A Question 5, students were asked for three factors: the words ‘cost’, ‘location’ and ‘support’ were not a sufficient response, as the question asked students to **outline** factors not list factors. It was also concerning that questions that clearly related to the system development life cycle (SDLC), such as Questions 6 and 8, were poorly done.

Section B has followed a consistent format for a number of years, and student responses are expected to be specific to the case study. This has been stated in previous Assessment Reports and is also indicated on the examination paper. It was disappointing to see that students still regularly lost marks for providing general answers that weren’t specific to the case study; if a student failed to address the case study they could lose up to 22 marks out of a possible 75. To address the case study, students should apply generalised knowledge to the particular context. They should refer to the particular organisation (Hotel Torquay), hardware (booths), procedures (registration) and people (the customers were guests, the staff were Sybil, Manuel, Basil, etc., and ‘hotel technicians’ rather than just ‘technicians’).

SPECIFIC INFORMATION

Section A – Short-answer questions

Question 1

| | | | |
|--------------|----------|----------|----------------|
| Marks | 0 | 1 | Average |
| % | 22 | 78 | 0.8 |

hertz

A large percentage of students were able to correctly identify hertz from the list of options given.

Question 2

| | | | |
|--------------|----------|----------|----------------|
| Marks | 0 | 1 | Average |
| % | 11 | 89 | 0.9 |

firewall

Students were able to answer this question with ease.

Question 3

| | | | |
|--------------|----------|----------|----------------|
| Marks | 0 | 1 | Average |
| % | 23 | 77 | 0.8 |

encryption

Question 4

| | | | | | |
|--------------|----------|----------|----------|----------|----------------|
| Marks | 0 | 1 | 2 | 3 | Average |
| % | 3 | 7 | 22 | 69 | 2.6 |

4i.

usability

4ii.

project management

4iii.

parallel conversion

A majority of students were able to give two or more correct answers.

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Question 5

| Marks | 0 | 1 | 2 | 3 | Average |
|-------|----|----|----|----|---------|
| % | 16 | 21 | 31 | 32 | 1.8 |

It was clear that many students were unable to give more than one-word (for example, 'cost') or one-phrase (for example, location of ISP) answers. Neither of these was sufficient to receive marks. The question asked students to outline factors when comparing two ISPs, so students should have considered economic, social or technical factors and explained each. Many students indicated that location was a factor; however, in itself location is not a factor unless it is related to services that couldn't be performed due to location, such as on-site technical support.

Question 6

| Marks | 0 | 1 | Average |
|-------|----|----|---------|
| % | 81 | 19 | 0.2 |

It demonstrates to the user/organisation that the system meets their goals/needs.

This question was particularly poorly answered, and students were unable to clearly articulate the main purpose of acceptance testing.

Question 7

| Marks | 0 | 1 | 2 | Average |
|-------|----|----|----|---------|
| % | 16 | 39 | 45 | 1.3 |

This question required students to describe two factors, apart from cost, which would need to be investigated before the travel agency could email a newsletter to its clients. The key words in this question were **describe** and **factors**. Students could not just list factors; they needed to describe with some detail what should be considered. Again students seemed to cover simplistic matters and provide little detail. Appropriate answers could have included discussions about newsletter format (so that it can be accessed easily in a global environment – PDF format as opposed to a specific desktop published version), customer needs, or possession of an email address.

Question 8

| Marks | 0 | 1 | 2 | Average |
|-------|----|----|----|---------|
| % | 29 | 45 | 26 | 1.0 |

A logical design should be produced, including a description of the problems with the existing system and what the new system has to do (not how to do it).

It was disappointing to see that only 26% of students received full marks for this question, which required students to describe the deliverables of the analysis phase of the system development life cycle (SDLC). As this is a key component of the Unit 3 students should have been able to provide an adequate response.

Question 9

| Marks | 0 | 1 | Average |
|-------|----|----|---------|
| % | 59 | 41 | 0.4 |

The bandwidth of a channel determines the amount of data it can carry in any given period of time.

Bandwidth is a key term that any student studying Information Systems should easily be able to describe; however, only 41% of students were able to provide an adequate response. Many students simply stated that it was the speed of data transfer on the Internet.

Question 10

| Marks | 0 | 1 | Average |
|-------|----|----|---------|
| % | 28 | 72 | 0.7 |

The administrator would use control levels to provide a range of security levels, limiting user access to data and/or privileges such as installing or uninstalling software.

It was clear that most students had studied network operating systems.

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Question 11

| Marks | 0 | 1 | 2 | 3 | Average |
|-------|---|----|----|----|---------|
| % | 9 | 38 | 21 | 31 | 1.8 |

11a.

Either of:

- 'write code' and 'create test data'
- 'document module' and 'test module'

11b.

'write code' and 'test module'

11c.

5.5 days

Many students were able to identify two tasks that could be done at the same time; however, many students were unable to identify the critical path, or the minimum number of days the project could be completed in.

Question 12

| Marks | 0 | 1 | Average |
|-------|----|----|---------|
| % | 58 | 42 | 0.4 |

A protocol is a set of rules that enables the exchange of data between computers.

Many students confused a protocol with a procedure or an IP address.

Question 13

| Marks | 0 | 1 | 2 | Average |
|-------|----|---|----|---------|
| % | 63 | 4 | 33 | 0.7 |

- Total – 8
- Number – 16

As this type of question has appeared on the examination for a number of years, it was expected that a majority of students would be able to correctly work through the algorithm. However, 63% of students did not receive any marks. Teachers should endeavour to work through as many examples of this type of question as possible to ensure students can attempt these successfully in the examination.

Question 14

| Marks | 0 | 1 | 2 | 3 | Average |
|-------|----|----|----|----|---------|
| % | 15 | 30 | 29 | 26 | 1.7 |

It was expected that students would write three steps or items that the organisation must do. Appropriate examples included designate a person responsible for the security of the site; monitor the site for signs of unauthorised access; and use a range of security measures such as firewalls, encryption, password authentication and antivirus software to protect data.

Many students were unable to outline a strategy that banks should use to reduce the possibility of electronic theft. A strategy is a method by which an activity is carried out—a set of steps or procedures; that is, who does it, what needs to be done, when does it happen, etc.

Section B – Case study

Question 1

| Marks | 0 | 1 | 2 | 3 | 4 | Average |
|-------|---|---|---|----|----|---------|
| % | 3 | 4 | 9 | 39 | 45 | 3.2 |

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| Concern | Factor |
|---|-----------|
| People do not like to line up and wait to book in. | Social |
| The hotel often has desk staff waiting with little to do until a rush comes. | Economic |
| The current system has been known to cause double bookings and reject bookings when space is available. | Technical |
| Many hours need to be spent each day processing bookings and admissions. | Economic |

Most students obtained marks in this question, with many getting three or more factors correct. Teachers should try and include this type of question in assessment tasks throughout the year.

Question 2

| Marks | 0 | 1 | 2 | 3 | 4 | 5 | Average |
|-------|----|----|----|----|----|----|---------|
| % | 19 | 16 | 20 | 18 | 12 | 15 | 2.4 |

2a.

Make reservation

2b.

Room

2c.

Accom_data

2d.

- Data flow: e_request or e_confirm
- Entity: Guests

Unlike previous years, this year's paper asked students to interpret a data flow diagram rather than construct parts of a context or dataflow diagram. Only a small percentage was able to complete all sections correctly. Many students were able to correctly answer parts a–c.; however, many found part d. difficult and were unable to link the data flows from the context diagram to the data flow diagram. Students should practise drawing as well as interpreting dataflow diagrams.

Question 3

| Marks | 0 | 1 | 2 | 3 | 4 | Average |
|-------|----|----|----|----|----|---------|
| % | 30 | 14 | 23 | 19 | 14 | 1.8 |

To receive full marks students should have selected A (main memory from 512 MB to 1024 MB) as the hardware component and then proceeded to justify their selection.

It was disappointing to see that 30% of students scored zero for this question. The justification should have included why the other two components were not required (for example, the server could not take advantage of a 64-bit processor as it only had a 32-bit operating system, and a 3-D video card has little relevance to the situation) and should have linked to the case study. The simplest way to do this was to indicate that the increase in memory would allow **faster processing of guest registrations**. Instead, many students wrote that it would allow faster data processing. Many students lost marks here as there was no link to the case study.

Question 4

| Marks | 0 | 1 | 2 | Average |
|-------|----|----|----|---------|
| % | 11 | 57 | 32 | 1.2 |

Students should have talked about what a firewall does: it does not stop viruses and that once a virus is within the (hotel) system there would be no way to eradicate it.

Students were generally able to explain why the use of a firewall alone was not a good decision; however, many did not link their response to the case study—there was no mention of the hotel and/or it processes as part of the answer.

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Question 5

| Marks | 0 | 1 | 2 | 3 | 4 | Average |
|-------|----|----|----|----|----|---------|
| % | 25 | 23 | 27 | 14 | 11 | 1.6 |

This question asked students to select cable or wireless for the hotel's registration booths in the foyer, and then to consider two technical characteristics that would need to be considered. Many students were unable to identify technical characteristics; for example, many responded incorrectly with simply a word such as 'cost', 'speed' or 'security'. Due to a lack of detail these answers were not given marks. Appropriate technical characteristics included: speed of data transfer, electrical interference, reliability of transmission, etc. It was also important that the comparison clearly linked to the case study, which many students did not do.

Question 6

6a.

| Marks | 0 | 1 | 2 | Average |
|-------|----|---|----|---------|
| % | 28 | 4 | 68 | 1.4 |

ai.

All text is in English.

aii.

The German and Chinese buttons should be in their respective languages.

6b.

| Marks | 0 | 1 | 2 | Average |
|-------|----|---|----|---------|
| % | 31 | 4 | 65 | 1.4 |

bi.

A lack of captioning for the two data entry boxes.

bii.

Captions should be included under or next the boxes to indicate where a customer's first and surname should be entered.

6c.

| Marks | 0 | 1 | 2 | Average |
|-------|----|---|----|---------|
| % | 15 | 8 | 78 | 1.6 |

The error message has insufficient explanation to help the hotel guests understand what they have done wrong or how to correct it.

The content of Question 6 had not appeared in this fashion on any previous written examination. A majority of students handled it with ease and were able to identify design errors and indicate appropriate corrections.

Question 7

| Marks | 0 | 1 | 2 | Average |
|-------|----|----|----|---------|
| % | 58 | 27 | 14 | 0.6 |

7a.

The poster is good for guests with limited computer knowledge who are trying to register.

7b.

It is easier to alter if changes are made to the hotel system in the future.

Students needed to provide advantages for a poster on the wall and for online help. Again, many students did not relate their responses to the case study, and simply wrote an advantage such as, 'the poster is good for people who are not computer literate'. The suggested responses above would have received full marks.

Question 8

| Marks | 0 | 1 | 2 | Average |
|-------|----|----|---|---------|
| % | 52 | 39 | 9 | 0.6 |

8a.

A bus carries data from one part of a computer to another.

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It was surprising to see that many students thought they should be describing a bus network; however, the picture indicates that this is clearly incorrect and that they should be describing the main purpose of an internal bus.

8b.

The function needed to relate to the case study, so 'process registrations' or 'process guest invoice data' were correct responses, but 'process data' was not.

Only a very small percentage of students answered both parts of this question correctly. Teachers need to ensure that computer architecture is covered throughout the year and as part of any exam revision program.

Question 9

| Marks | 0 | 1 | 2 | 3 | 4 | Average |
|-------|----|----|----|---|---|---------|
| % | 26 | 28 | 32 | 8 | 6 | 1.4 |

Any two of:

- the program will not be large, so there is no need for the hotel to go to the expense of a hard drive
- ROM should make logging in faster for guests as there is no need to access any secondary storage and the hotel wants to offer a speedy service for its guests
- as ROM is read only, data cannot be edited or deleted by guests registering at the booths.

The small percentage of students that received full marks indicates that a majority of students provided generic responses that were not linked to the case study; however, a non-linked response would have received some marks in this question. It was also surprising to see that many students confused a computer ROM with a CD-ROM. This and other similar questions indicated that more time throughout the year may need to be spent covering hardware components and their function and capabilities.

Question 10

| Marks | 0 | 1 | 2 | 3 | Average |
|-------|----|----|---|---|---------|
| % | 62 | 24 | 9 | 5 | 0.6 |

The most appropriate input device for the registration booths would have been a touch screen.

Appropriate reasons could be:

- a touch screen is more secure, as it would be harder to steal or break and this will be important for the hotel as the registration booth is in the exposed area of the foyer of the hotel
- a touch screen is easier to use, especially for the disabled, and as the hotel is a service provider to the public it should be seen to be catering for everyone
- a touch screen more easily accommodates non-English characters (such as Arabic or Chinese).

Students should have provided three reasons related to the case study to support their choice. It was again clear that a majority of students were either unable to provide adequate justification or had no link to the case study in their responses, as only just under five percent received full marks.

Question 11

| Marks | 0 | 1 | 2 | 3 | 4 | 5 | Average |
|-------|---|---|----|----|----|----|---------|
| % | 3 | 8 | 17 | 17 | 34 | 21 | 3.4 |

| Criteria descriptions | Term |
|--|-----------------|
| The hotel staff must be able to add extra room categories and change pricing. | maintainability |
| The system must not cause a wait of more than 3 seconds to answer any request from the booths. | efficiency |
| Each booth must not be unusable for more than 3 hours per month. | reliability |
| 95% of all guests must be able to use the booth without help. | usability |
| The speed of a guest booking into the hotel must be reduced by 30% on average. | efficiency |

Most students were able to gain some marks on this question; however, a number still confused efficiency and effectiveness.

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Question 12

| Marks | 0 | 1 | 2 | 3 | 4 | 5 | 6 | Average |
|-------|----|----|----|----|----|---|---|---------|
| % | 10 | 18 | 18 | 35 | 10 | 4 | 4 | 2.5 |

Either of:

- router, server, switch
- modem, server, router.

It was disappointing to see that many students were unable to correctly identify all three components and provide functions that linked to the case study. A number of students confused the 'Room Management System' computer with the file server for the Hotel. It also appeared as if students wrote the three components in any order, rather than following the diagram provided. Students should use the stimulus material available to them, as the numbering in the diagram corresponded to the numbering in the answers.

With regard to the components it was clear that students knew about each of the components required; however, rarely did they link that function to the case study. For example, a common answer was, 'Component 1: modem, Function: to modulate or demodulate signals between a phone line and a computer to provide a connection to the Internet'. This answer would not have received a mark for the function. In order to gain the mark, the function had to be written along the lines of, 'Function: to modulate or demodulate signals between a phone line and the hotel's router to provide a connection for the hotel's information system to the Internet'.

Question 13

13a.

| Marks | 0 | 1 | 2 | 3 | 4 | Average |
|-------|----|----|----|---|---|---------|
| % | 43 | 21 | 21 | 9 | 6 | 1.2 |

| Test | Room Type | Arrival Date | Departure Date | No People | Season | Expected Printout | What is Printed |
|------|-----------|--------------|----------------|-----------|----------|-------------------|-----------------|
| 1 | 1 | 21/01/2005 | 22/01/2005 | 4 | Normal | 120 | Nil |
| 2 | 2 | 14/01/2005 | 16/01/2005 | 2 | Off Peak | 360 | 540 |

Over 40% of students did not get any answers correct in the testing table.

13b-c.

| Marks | 0 | 1 | 2 | 3 | 4 | Average |
|-------|----|---|----|---|----|---------|
| % | 60 | 5 | 22 | 1 | 12 | 1.0 |

13b.

bi.

Until Cust_Date > Departure_Date

bii.

Change the '>' to '>=' or '='. This will then stop the calculation at the correct number of days instead of having to do the calculation once more to increase the date to more than is listed.

13c.

ci.

Print Total_Cost

End If

This only prints the total cost if the season is off peak, as the print command is inside the if statement.

cii.

End If

Print Total_Cost

The End If should appear in the algorithm before the Print Total_Cost so that it gets printed whether the if statement is carried out or not.

Over 60% of students did not get any marks for parts b. or c. Software development is a major part of the internal assessment of this course, and students should be creating test tables before developing an algorithm, and then testing that algorithm prior to using it as the design for their software.

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13d.

| Marks | 0 | 1 | 2 | 3 | 4 | Average |
|-------|----|----|----|---|---|---------|
| % | 32 | 30 | 27 | 9 | 2 | 1.2 |

| Variable Name | Type of variable |
|---------------|-----------------------|
| Total_Cost | Numeric/Real/Currency |
| Arrival_Date | Date |
| Room_Cost | Array |
| Season | String |

In part d. again only a small percentage of students was able to correctly complete the table. As students complete a range of programs for internal assessment that include numeric, string and array type variables it was disappointing to see that many were not able to transfer this knowledge to an examination situation.

Question 13 contained the traditional algorithm that needed to be bench tested using the values provided to locate the errors. Even though this style of question has appeared on the written examination for many years, it was clear that many students still struggled with the concept of actually bench testing an algorithm in preference to making assumptions about the algorithm logic. Teachers need to continue to practise this type of question throughout the year, and students should document their bench testing for algorithms produced for assessment.

Question 14

| Marks | 0 | 1 | 2 | 3 | Average |
|-------|----|----|----|----|---------|
| % | 16 | 25 | 33 | 26 | 1.7 |

A majority of students were able to gain two or more marks for this question. Students had to discuss the conflict indicated. The easiest way was to provide both sides of the issue, including arguments for and against, or give both advantages and disadvantages of a particular solution. For this issue it would also have been appropriate to indicate the legal standing of both parties. Students found it easier in this question to link it to the case study as they had to talk about Polly and the hotel when discussing the conflict.

Question 15

| Marks | 0 | 1 | 2 | 3 | 4 | Average |
|-------|----|----|----|----|----|---------|
| % | 13 | 16 | 40 | 16 | 14 | 2.0 |

The relevant factors included:

- the method of obtaining data via the Internet – the data should be encrypted
- the security of guest data – as guests provide personal details, including their credit card numbers, the hotel must be able to guarantee that it is not being accessed by others

Most students were able to identify factors, but many did not discuss those factors with regard to the hotel.

Question 16

| Marks | 0 | 1 | 2 | 3 | 4 | 5 | 6 | Average |
|-------|---|----|----|----|----|----|----|---------|
| % | 9 | 14 | 21 | 18 | 17 | 11 | 10 | 3.0 |

16i.

Employee: programmer (Polly)

Reason: as the hotel program is causing problems, lines of code need to be rewritten.

16ii.

Employee: technicians

Reason: technicians are responsible for fixing equipment used in the registration booths.

16iii.

Employee: system designer (Basil)

Reason: as there is a network design problem with the registration booths, the system designer is the appropriate person to fix the problem.

This question required students to identify from the list provided who would be responsible for fixing the identified problems. A majority of students were able to provide the correct employees; however, again many found it difficult to provide responses that were related to the case study.

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Question 17

| Marks | 0 | 1 | 2 | 3 | Average |
|-------|----|----|---|---|---------|
| % | 75 | 11 | 8 | 6 | 0.5 |

Only 25% of students received marks on this question. The remaining 75% either did not answer the question or wrote a response that was about testing the system (that is, purposefully crashing) in preference to evaluating the system. Evaluation occurs after implementation, at a set time frame (for example, six months, 12 months) and involves reviewing the system's performance to see that it is meeting the system objectives and the needs of the organisation. Its performance should be compared to estimates and criteria indicated in the analysis, design and implementation stages and the social and economic effects of the system. For example, one part of a strategy might be to review the hotel's system logs to see recorded down times.