



2012 Information Technology: IT Applications GA 3: Examination

GENERAL COMMENTS

Questions on the IT Applications 2012 examination paper were based on the key knowledge and key skills that are set out in the *VCE Information Technology Study Design* (2011–2014).

Generally, students who were able to apply their knowledge and understanding to the specific context of a question achieved higher marks than those who provided a more recall-type response. Similarly, students who could draw on their practical experiences of using relational database management systems (RDBMS) or spreadsheet software when answering the relevant questions scored well.

The positive influence of students' familiarity with online communities was very evident in the responses to the social media question (Section B, Question 6). Most students were able to develop a coherent argument to support their point of view about the relationship between users' needs and solutions. The responses to this question contained well-thought-out examples of functions and applications that are available on social media websites and their alignment with users' needs.

Similarly, many responses indicated that students understood the interpersonal aspects that complicated the ethics of accepting stolen printing credits (Section B, Question 8). Many students outlined three or four issues to be considered, stated that there was a need for a systematic response and identified a range of points of view.

Generally, students could identify the design elements used in a prototype website and explain how these influenced the appearance of the website (Section B, Question 7). They could also choose an appropriate design tool to represent the appearance of a website. Less well understood was the influence of design elements on the functionality of a website. Many students did not annotate the diagram as required.

Finally, teachers are reminded that questions usually ask students to 'state', 'explain', 'discuss' or 'justify' some feature that is described in a scenario and that each of these words is requesting a specific type of response. This is also the case where a 'procedure' or 'strategy' is mentioned in a scenario. It was very pleasing to see that many students understood that each of these words refers to a sequence of processes or set of actions.

Problem-solving methodology

The problem-solving methodology (*VCE Information Technology Study Design*, pp. 16–18) is fundamental to the IT Applications study, and it is critical that students have a sound understanding of the purpose of the methodology, the role of each stage and the nature of the activities undertaken in each of these. Generally, students performed poorly on the multiple-choice questions based on this methodology. It is pivotal to every Area of Study and as such will be addressed in a variety of ways in examinations.

SPECIFIC INFORMATION

Section A – Multiple-choice questions

The table below indicates the percentage of students who chose each option. The correct answer is indicated by shading.

Question	% A	% B	% C	% D	Comments
1	13	75	7	5	
2	11	12	74	3	
3	9	11	18	61	
4	19	9	60	12	
5	12	10	62	16	Option C (name: custPhNum, data type: text) is the most efficient name and correct data type because 'custPhNum' is more easily and quickly identified by users as the field name for the given phone numbers. A field name 'cusPn#' could be interpreted as a customer PIN field.

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Question	% A	% B	% C	% D	Comments
6	32	5	58	5	Option A (enter a lot of data to make sure the stock numbers are correct) occurs during development. Creating a set of evaluation criteria (Option C) occurs during design. Students need to take into account the problem-solving methodology and activities that are performed in each of the four stages.
7	1	5	82	12	
8	29	12	10	48	
9	6	64	16	13	
10	2	18	4	76	
11	5	88	3	4	
12	15	56	21	7	
13	18	66	9	7	Option C (send new entitlement information to the relevant employees' company mobile phones) is the quickest, easiest and cheapest way for a telecommunications company to communicate the information to the people affected. As all employees have been issued with a mobile phone, direct contact is assumed. Option A relies on relevant employees having access to the internet in order to receive their emails. A home page on an intranet (Option B) is not an appropriate place to store a large amount of personal information and there would not be enough space. Providing a written copy of entitlements (Option D) is not cheap.
14	15	16	15	55	
15	82	3	8	7	
16	28	47	23	2	
17	65	27	2	6	
18	2	12	84	1	
19	22	22	8	48	Option D (undertaking a risk assessment, and documenting and practising the procedures for managing risk to an organisation's data and employees) is complete because it involves undertaking risk assessment, and documenting and practising procedures for managing risk to an organisation's data and employees.
20	33	14	32	20	Conducting tests and recording results (option A) are part of developing a solution. Considering the constraints and conditions that need to be met (Option C) and determining what benefits the solution will bring to users (Option B) are both part of analysis. Students are reminded to refer to the problem-solving methodology and activities associated with each of the four stages.

Section B

Question 1a.

Marks	0	1	2	Average
%	45	16	39	0.9

Many correct responses identified well-known software, such as Dreamweaver or Notepad, to receive a mark. Explanations that gained a second mark included 'allowing users to create links using http' or 'helping users to create web pages that can be viewed or tested'. Students who named less well-known software and explained how it could be used to create a website also received full marks.

Question 1b.

Marks	0	1	2	Average
%	28	17	55	1.3

One mark was allocated to naming a hardware component and one mark for a description of its function. The most common student responses were 'web server' or 'hard disk' as the hardware component. Other accepted answers

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included any one of Network Interface Cards, modems or routers (network hardware). Acceptable descriptions of the functions for web servers, hard disks and network hardware included 'stores applications', 'stores data files' and 'provides communication to the network'.

Question 1c.

Marks	0	1	2	Average
%	21	47	32	1.1

Most responses to this question identified either 'privacy of client data as a legal obligation' or 'confidentiality of client data as part of ethical business practice'. Typically, these students argued that the website should be closed and accessed only by registered clients using a login identity and password. Students who argued for an open website and explained that they wanted to encourage more business or have more open discussion were also rewarded.

Question 2

Marks	0	1	2	3	Average
%	6	35	42	17	1.7

Students had to identify the possible consequences of a user's action. Responses that described possible scenarios and likely consequences for the company's information system received marks. For example, one effect is that anyone else in the office can access at least the network and possibly private client data. This means that the business has not met its legal obligations. Another effect is that incorrect shutdown or power-off can cause data loss because the most recent activity is not saved or client files are corrupted. Another effect is that changes to data might not show up because the intruder is wrongly identified as a legitimate user. As a consequence, the company could lose customer data and not know it has gone or been stolen, or not be able to identify who last accessed a file.

Question 3a.

Marks	0	1	Average
%	44	56	0.6

Students who chose RDBMS typically stated 'Sort Average field Z to A'. Students who chose spreadsheet software typically stated 'Sort the Average column Z to A'.

Question 3b.

Marks	0	1	2	Average
%	67	17	17	0.5

Many students struggled with this question. Correct responses included 'displaying in bold or red font with the label 'Average' and displaying 'as a graph so that parents can compare individual marks to the average'. Marks were also awarded to answers that focused on the number of decimal places appropriate for a report. Examples of student responses included

- there should be no decimal places because the data has no decimal places
- round the average to whole numbers because it makes it easier for parents to read
- round the average to two decimal places because people are used to reading this format.

Question 3c.

Marks	0	1	2	3	Average
%	29	17	24	30	1.5

Responses that covered the three steps in a testing procedure received full marks. These steps are: 'create test data', 'use a calculator or desk check' and 'compare manually calculated answers to software answers' or 'get another person to check manual answers'. Students handled this question reasonably well.

Question 4a.

Marks	0	1	Average
%	45	55	0.6

While more than half of the students received a mark for this question, the result indicated that many students do not understand that a particular design tool is chosen for a specific purpose. Lists of design tools for representing the appearance of a solution appear in the Glossary of the study design (page 13) and in the problem-solving methodology section on page 17. A range of answers was accepted, with the most commonly provided design tools being 'layout diagram', 'storyboard' or 'screen mock-up'. Other design tools used to represent the appearance of a website were also accepted.

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Question 4b.

Marks	0	1	2	Average
%	48	33	20	0.7

High-scoring responses included two steps. The first was to identify what would be measured and the second was a comparison over time. The most frequently accepted responses were

- number or duration of visits to the site in one month compared to those in a previous month
- trends in sales of online music
- check sales against criteria set during the design of the site.

Question 4c.

Marks	0	1	2	Average
%	32	17	51	1.2

There was a variety of accepted responses to this question. Those that were accompanied by a reasonable, plausible explanation of how the on-screen user documentation applied to new users purchasing music online achieved high marks. Typical examples were

- content-sensitive help automatically shows users how to solve a current problem when purchasing music
- FAQs provide answers to questions that are commonly asked by new users
- online tutorials provide step-by-step instructions for buying music online.

Question 4d.

Marks	0	1	Average
%	61	39	0.4

Students received a mark for stating the *Copyright Act 1968* or the *Privacy Act 1988*.

Question 5a.

Marks	0	1	Average
%	61	39	0.4

‘Online survey’ and ‘form’ were the most frequently accepted responses to this question. This question related directly to a key skill in Unit 3, Outcome 2, Task 2 (techniques for acquiring data via websites), and the key knowledge for this Area of Study specifically mentions ‘voting’ as a reason why individuals and organisations supply data via websites.

Question 5b.

Marks	0	1	2	Average
%	21	46	33	1.1

Most students answered this question well. A range of responses was accepted for this question, including

- allow voting only by users with usernames and passwords to ensure users vote only once
- to protect voters’ privacy, encrypt any data after it is acquired so that only authorised people can read it
- provide anonymity by removing names or aggregating data and only count totals.

Question 6

Marks	0	1	2	3	4	Average
%	8	12	27	25	28	2.5

Students had to identify a social media website and respond to a statement about the relationship between users and the website. The question was very well answered. Most frequently, students identified Facebook and then went on to describe situations in which users’ needs had resulted in a range of additional functions being added to the website. For example

- chat was originally for communication only between college students, but registration was opened to all when complaints indicated that users found this too restrictive
- users wanted to read other people’s profiles and share photos, so Facebook has, over time, created a space for personal profiles where you can publicly or privately share photos or post comments on your profile.

Some students referred to a ‘growing democratisation’ of the social media website and gave a range of examples to support this claim. For example

- it has responded to user criticism of changes to the privacy policy by allowing users to vote on whether proposed changes should be implemented

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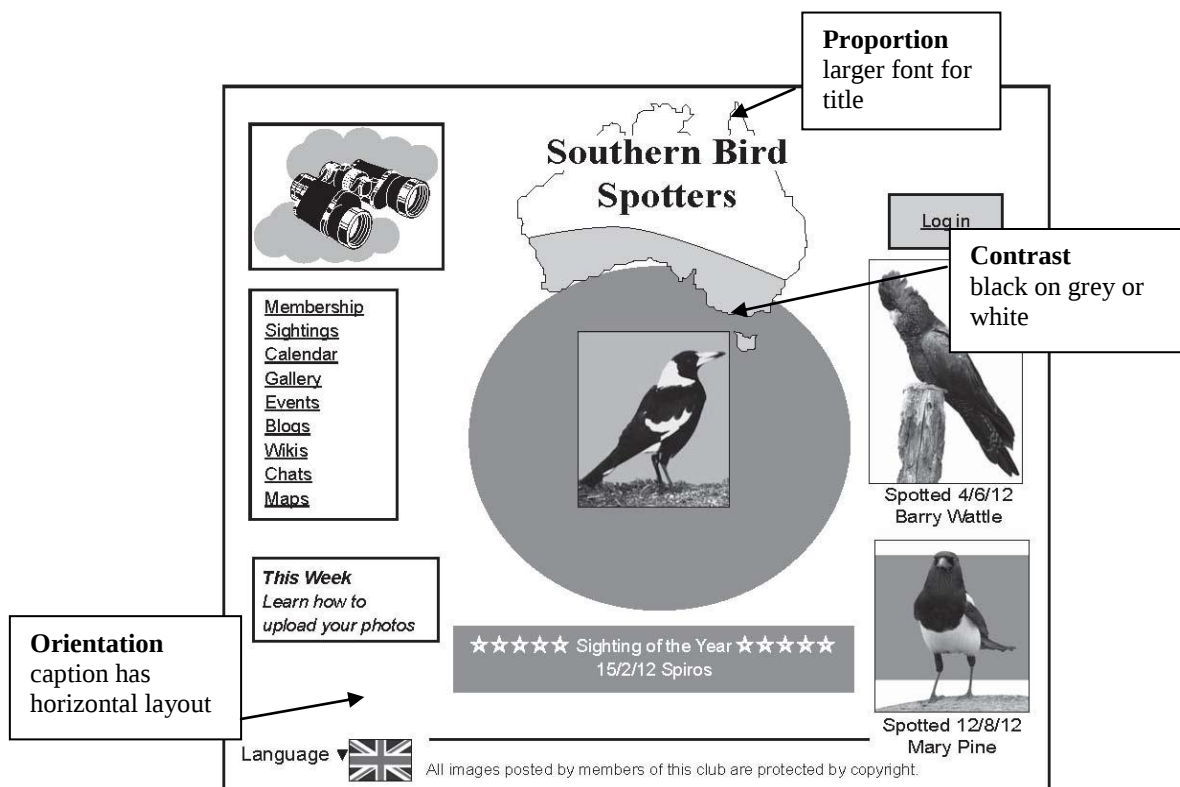


- users can choose the level of security they want and speak only to people they know
- users can invite new friends to join the conversation
- users can track the activity of existing friends.

The few students who argued that changes were brought about by commercial needs and who provided a coherent argument with examples to illustrate their claim also received marks.

Question 7a.

Marks	0	1	2	Average
%	29	7	63	1.4



The majority of students scored full marks on this question, though some did not annotate the mock-up. Those who correctly labelled any two of the many examples available received full marks. The mock-up above shows examples of correct answers.

Question 7b.

Marks	0	1	2	Average
%	16	29	55	1.4

Most students could describe features on the website to illustrate how two of the three design elements were used to enhance the appearance of the website. For example

- contrast – a white or grey background is used with black text or a black background with white text so that images and words stand out and appear more vibrant
- orientation – the shape containing the links is in portrait format because it is a list and the citing of the year is in landscape format because the caption text is on two longer lines
- proportion – font and image sizes have been used to create a hierarchy, where larger elements, such as the title, are more important.

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Question 7c.

Marks	0	1	2	3	4	Average
%	8	9	24	25	34	2.7

Most students chose to explain how navigation and relevance had been used to enhance the functionality of the website. Typical responses include

- navigation – major links are underlined or are in a box on the left; the login link is in a prominent position. Together, these let members access the login screen and then choose what they want from the link list.
- relevance – images are of birds found in the region shaded in the map or indicated in the club's name. This is what the club is about – birds sighted in the southern parts of Australia.

Very few students chose to explain how appropriateness influenced the functionality of the website. Those who did suggested that the club takes birds and knowledge about birds seriously. Typical responses include

- the images are all of birds and are of good quality
- there is no bad language, no jokes and no images of dead birds.

Question 7d.

Marks	0	1	2	3	4	Average
%	12	12	39	22	15	2.2

Students were required to address the two aims stated in this question to receive full marks.

With regard to the first aim, many students identified features that would allow members to share and exchange information. For example

- users can share knowledge by clicking on links to blogs, wikis, chats, a photo gallery and an events calendar
- members can discuss birds and find out where some species are located
- new users can find out how to become members.

Fewer students were able to address the second aim – share a collective identity. Typically, appropriate student responses referred to members 'identifying with the logo', 'using the image of binoculars' or 'using a map' to encourage a collective identity.

Question 8

Marks	0	1	2	3	Average
%	8	22	40	30	1.9

This question was well answered. Many students framed questions that Ally might ask herself. For example

- is it fair to use other students' money?
- is her loyalty to Jack more important than to other students or to the school?
- how would I feel if it was my money that is being used by someone else?

High-scoring responses typically started with an introductory statement about Ally's problem, identified a likely consequence and recommended an option for action. For example

- Ally needs to realise Jack is stealing ... ask herself if the school's reputation will suffer ... she should talk to Jack and ask him to stop
- Ally needs to decide if her friendship with Jack is more important than ... doing the right thing ... she should help Jack to think about others.

Question 9

Marks	0	1	2	3	4	5	6	Average
%	38	15	16	13	10	7	2	1.7

Few students gave complete responses to this question. Many were able to correctly normalise the data but did not attempt to explain how each normal form contributes to data being stored efficiently and redundancy or repetition being avoided.

Some responses comprised drawings of tables that were accompanied by explanations. Other responses consisted of explanations with references to examples of changes to the fields shown in the original table. Both types of responses were acceptable.

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With regard to the first normal form, students either stated that a field should contain only a single item of data and provided an example or they prepared a new table in which the 'Address' field was separated into three new fields of 'StreetNumber', 'StreetName' and 'Suburb'. An explanation of the reason for this adjustment was also required. The most frequent explanation for separating the 'Suburb' from the 'StreetName' or the 'FirstName' from the 'LastName' is it allows for greater accuracy and more detailed searches. For example, 'drivers can be grouped by suburb and then assigned to jobs so that driving time is reduced' and 'names can be sorted alphabetically by LastName so that browsing a list is faster'.

With regard to the second normal form, students either stated that the fields should be grouped into two separate tables of 'Member' and 'Driver' so that each field could relate to a unique identifier or primary key for that field, and provided an example, or they prepared the two tables and explained the need for the primary key fields of 'MemberID' and 'DriverID'. Other accepted explanations included 'creating relationships' and problems associated with 'deleting and updating records'.

With regard to the third normal form, students either stated that one field should not rely on another field or indicated with a diagram that the 'TotalFee' should be calculated in a query or report by multiplying the data from the 'YearsWorked' and 'CarRate' fields. The most frequent explanations were that this was more efficient because 'data was not repeated' and calculations were 'processed only when needed'.

Question 10a.

Marks	0	1	Average
%	49	51	0.5

Question 10b.

Marks	0	1	2	Average
%	47	18	35	0.9

Question 10c.

Marks	0	1	2	3	Average
%	36	28	27	9	1.1

Students who chose spreadsheet software generally used a filter function and 'IF' statement in their response to this question. High-scoring responses used names and headings from the question. Examples of accepted responses include

- use a filter function on the 'TrainingDay' column and select 'Mon'
- use a filter function on the 'Coach' column and select James **and** use the filter function on the 'AgeGroup' column and select 'Junior'
- use the 'IF' statement in a new labelled column to list seniors from the 'AgeGroup' column **and** applied the 'Count' function multiplied by 450.

Responses that applied the 'CountIF' function to the correct column and explained how the result should be displayed and labelled also received marks.

Students who chose RDBMS software generally used queries, filters and 'Sum' or 'Total' in their responses. Examples of accepted responses include

- use a filter TrainingDay = 'Mon'
- use a filter 'Coach= James' **and** AgeGroup= 'Junior'
- use a filter AgeGroup = 'Senior' and a query called 'SeniorFeeTotal to sum the 'FeePaid' field.

Responses that used 'Count*450' on the filtered 'AgeGroup' field were also awarded marks.

Question 11a.

Marks	0	1	2	Average
%	17	36	47	1.3

This question was very well answered, with most students providing appropriate examples to support their recommendations and strategies.

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The most frequently accepted response to this question was ‘encrypt the Apps-R-Us files so that they are unreadable to anyone who does not have the encryption key’. Responses that suggested a firewall and clearly described how it protected the apps stored online from external threats were also awarded marks.

Question 11b.

Marks	0	1	2	Average
%	36	31	33	1.0

Successful testing strategies involved comparing two versions of a file. Some students suggested uploading a file twice and comparing the two. Others suggested checking that all of the coding is present in both copies of the file.

Question 11c.

Marks	0	1	2	Average
%	23	28	49	1.3

There was a variety of accepted responses to this question. The most common response was that backup and retrieval depends on the internet functioning. Other acceptable responses included

- security depends on procedures being followed correctly at a remote location
- processes are managed by people you do not know
- the cloud company could steal your data or go bankrupt.

Question 12

Marks	0	1	2	3	4	5	6	7	8	9	Average
%	22	8	11	12	11	9	11	7	4	4	3.4

The responses to this question were frequently well framed and coherent. Most students set out their response under the three main headings: review the sales trends, drop the two models and reward sales staff. Under each heading they then described the data required for processing, a function used and the test data required.

Students who selected spreadsheet software included an introductory description or drawing of the column structure in their response. For example, ‘Set up a spreadsheet with ‘Staff’, ‘Bicycles’ and ‘Sales’ worksheets. Use columns for ‘StaffID’, ‘BicycleModel’ and ‘QuantitySold’ in the ‘Sales’ worksheet to record each sale. Then ‘At the end of three months the Manager would’

Review the sales trends

- Select the ‘BicycleModel’ and ‘QuantitySold’ columns to create a column graph to show monthly sales during the three-month period. This will give the manager a visual indication of sales trends for each model.
- An accepted response for testing the functionality of the solution was ‘use various quantities sold for some models each month and check against the expected graph’.

Drop the two models

- Use a ‘SUM’ formula to record the total of ‘QuantitySold’ for each model and ‘SORT function A to Z’ to identify the two lowest-selling models.
- An accepted response for testing the functionality of the solution was ‘create equal quantities sold for some models and compare to the expected output’.

Reward sales staff

- Use an ‘IF QuantitySold is greater than 20’ statement to create an alert in a column called ‘Bonus’.
- An accepted response for testing the functionality of the IF function was ‘QuantitySold is 19, 20 and 21 and compare to the expected alert’.

Students who selected RDBMS software included an introductory description or drawing of the tables and fields. For example, ‘Create database tables ‘Staff’, ‘Bicycles’ and ‘Sales’ with the fields ‘StaffID’ and ‘BicycleModelID’, and ‘SaleID’ and ‘QuantitySold’ in the ‘Sales’ table. Then ‘At the end of three months the Manager would ...’

Review the sales trends

- Create a report with a graph using the ‘QuantitySold’ field to show trends in monthly sales or give the manager a picture of sales trends for each model with a summary table.
- An accepted response for testing the functionality of the solution was ‘change quantities sold for the two models each month and check the actual graph’.

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Drop the two models

- Create a report using the 'SUM for each Bicycle Model' and display the list sorted A to Z. Identify the two lowest-selling models.
- An accepted response for testing the functionality of the solution was 'use equal quantities sold for some models and check the actual minimums'.

Reward sales staff

- Create a query using 'QuantitySold is greater than 20' to list all 'StaffID who get a bonus'.
- An accepted response for testing the functionality of the 'Bonus' list was 'QuantitySold is 19, 20 and 21 and check the actual outcome'.