

2015 VCE Information Technology: IT Applications examination report

General comments

The 2015 Information Technology: IT Applications examination was the final paper based on the four learning outcomes and associated key knowledge and skills in the *VCE Information Technology Study Design*.

Students were able to design screens for online transactions, taking into account the particular needs described in a given scenario. Responses demonstrated that students were aware of a wide range of layout conventions and design elements. They were able to explain, in brief annotations, how these enhanced the effectiveness (clarity) of communication. In Question 5 annotations were added to screen designs to explain how, for example, the central placement and hierarchy of text helped to establish the identity of the company, encourage users to participate in T-shirt design activities and buy products.

Students demonstrated some understanding of the purpose and process of normalisation. When presented with a flat file data table, most students provided partial solutions consistent with the third normal form (3NF); however, many students did not score any marks for this question.

Responses that focused on the specific requirements stated in the question and that provided examples appropriate to the given scenarios were awarded high marks. It is worth noting that questions couched in terms of efficiency or effectiveness require responses that address one or more of the components of these two qualities. To address efficiency, for example, a response needs to include an example of time, cost or effort. To address effectiveness, a response needs an example of improved accuracy, timeliness, completeness, readability, attractiveness, accessibility, relevance, usability or clarity of message.

It was clear that students understood the roles of various procedures and equipment used to protect data and information within security and backup strategies of an information system. However, many students confused evaluation with testing.

Students drew on their experience with their chosen software application to solve problems. In Question 10, for example, some students created a wide variety of innovative and thoughtful RDBMS and spreadsheet designs to solve the problem of storing and manipulating data shown on a mobile phone screen.

Specific information

This report provides sample answers or an indication of what answers may have included. Unless otherwise stated, these are not intended to be exemplary or complete responses.

The statistics in this report may be subject to rounding resulting in a total more or less than 100 per cent.

Section A – Multiple-choice questions

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

Question	% A	% B	% C	% D	Comments
1	13	7	16	65	A proxy server is an intermediary server that provides access to online resources from other servers. Unique IP addresses are allocated by the Internet Assigned Numbers Authority (IANA).
2	3	7	87	2	
3	71	22	6	1	Managers need both an overview of the new system and experience in using the new forms associated with all stages of the input-process-output cycle. A tutorial will meet both needs.
4	10	6	10	74	
5	21	61	8	9	
6	34	2	9	56	
7	11	24	64	2	
8	17	5	22	55	
9	6	2	91	1	
10	89	3	5	3	
11	3	4	7	87	
12	7	6	55	31	
13	14	55	14	16	
14	10	30	43	17	The committee is planning the schedule for 2016 and beyond. A strategic decision will apply for more than a year.
15	23	61	9	7	The study design states that design involves 'identifying what specific data is required' (page 17).
16	14	43	8	34	The Attendance data is numeric and is right aligned. The Time heading is text and is left aligned. These are the most appropriate conventions for the data.
17	20	31	35	14	Storyboards provide a visual representation of individual web pages and site maps show the relationships between those web pages in the whole website. Together they provide detail and an overview.
18	60	17	2	21	
19	82	7	5	6	
20	4	11	44	41	Disposal of players' data by overwriting it with new data means the application software and system software remain. If the disk is reformatted all data and software are removed, not just one player's record. As part of a management strategy to dispose of players' data, overwriting is more practical than deleting and reformatting the hard disk.

Section B

Question 1

Marks	0	1	Average
%	18	82	0.8

Most students stated one reason for a sports club to have a closed section on its website. Correct responses stated that if the website is closed, private or match information is only seen by other members or stated that this allows members to chat safely among themselves.

Question 2

Marks	0	1	2	3	4	5	6	Average
%	8	8	14	17	21	16	16	3.5

Responses to this question indicated that students understood the difference between full and incremental backup strategies. Most students gave one reason for the use of a strategy, either in terms of the location and timing or the choice of storage medium. Students who explained each strategy in terms of location, timing and media received high marks. Examples of responses that received marks are shown in the table below.

Storage	Description of storage strategy	Explanation of reason for storage strategy
weekly full backup	<ul style="list-style-type: none"> All client records are saved to an on-site tape at the end of each week. All client records are updated/saved on Saturday or Sunday night. 	<ul style="list-style-type: none"> A full backup to tape is slow. At the weekend, records are unlikely to change while backup is happening. A full backup to tape stored on-site means that records are available quickly if the internet is down and the system needs to be restored.
nightly incremental backup	Only those records that have changed during the day are backed up to the cloud each night.	<ul style="list-style-type: none"> An incremental backup keeps the records up-to-date daily. It is as easy as a click to save to the cloud. Saving only those records that have changed is faster than saving all records. This ensures that the records are accurate at the end of each day and saving to the cloud means they are easily recovered if needed.

Question 3a.

Marks	0	1	Average
%	27	73	0.8

Responses that identified an advantage of online shopping directly for the ViteHealth business received a mark. Students who described an advantage for the customers of ViteHealth and who then explained the subsequent benefit for ViteHealth also received a mark. Students did not score

a mark if they only described an advantage to the customer. Examples of correct answers included:

- access to a global market leads to increased customers and sales
- it is easier for a customer to place an order and this leads to increased sales
- lower overhead costs than a shop, hence a potential increase in profit.

Question 3b.

Marks	0	1	2	3	4	Average
%	10	5	31	10	44	2.8

Many students satisfactorily recommended and justified two techniques that ViteHealth should use to protect the rights of customers supplying data online.

With regard to the security techniques, the majority of responses suggested login and password using HTTPS. Justifications included:

- the need to secure private financial data from hackers and spyware
- to prevent bogus customers from placing orders.

Responses associated with customers' rights included:

- a privacy policy that explains how data will be used
- a shipping and returns policy that explains delivery procedures and costs along with warranties
- a means of tracking an order that provides contact details for complaints.

Most commonly, the justification provided was that the business is required by law to explain why data is collected. Other justifications included:

- good customer relations leads to a good reputation
- good data helps to keep the business running efficiently
- good security stops hackers from destroying the business's reputation.

Question 4a.

Marks	0	1	2	Average
%	7	12	81	1.8

Most students selected the 60KB File B in JPG format. They justified their choice by explaining that the smaller file loaded faster than the larger file, or that the JPG format is widely used on websites whereas the BMP format will not load on all browsers. A small number of students noted that the BMP format would provide a better quality image. These also received a mark.

Question 4b.

Marks	0	1	2	Average
%	21	31	48	1.3

Responses that described a plan to compare the load times of each image received marks. High-scoring responses included: '*Michael could use each image in his website and compare how quickly each loads*' and '*Michael could see if each loads*'.

Question 5a.

Marks	0	1	2	3	4	5	6	7	8	9	Average
%	3	1	2	5	10	12	16	19	19	12	6.1

Responses that represented the required features listed in the design brief and that also annotated a layout convention, a link convention and a navigation design element, received marks.

The features most frequently shown/drawn in responses and accepted were:

- business name
- login/password
- secure purchase from range of existing T-shirt designs
- track order link
- secure chat link
- design your own link
- privacy statement
- language option drop list.

The most frequently accepted annotations were:

- layout convention – centrally placed business name
- link convention – underlined text proceed to checkout
- navigation design element – a side menu listing links or a single row table across the home page.

Question 5b.

Marks	0	1	2	Average
%	38	29	33	1

Students were asked to explain how the layout convention they annotated in part a. met the needs of Choices@T-shirts. The answer shown below is typical of a response that received full marks. Many other conventions and associated explanations also received marks.

Convention	Explanation
Business name text is top and centre of the home page.	The business name gives the website its identity and needs to be at the top and centre of the opening screen so it is the first text seen when the website opens.

Question 6

Marks	0	1	2	3	4	Average
%	42	15	17	18	7	1.4

Most students received a mark for grouping the data into tables for: Books, Buyers, Authors and Orders. Further marks were awarded for reducing the fields to contain single elements of data and adding appropriately named primary keys. The response most frequently awarded full marks is shown below. Other answers that complied with third normal form (3NF) were also awarded marks.

Table 1

Table: Books
BookID
BookTitle
UnitPrice

Table 2

Table: Buyers
BuyerID
LName
FName
ContactEmail

Table 3

Table: Orders
OrderID
Quantity

Table 4

Table: Authors
AuthorID
LName
FirstName/Initial
SecondName/Initial

Question 7a.

Marks	0	1	Average
%	17	83	0.9

Most students correctly read the graph and used the rating scale key to identify network security controls as the security category considered 'very effective' by the greatest percentage of companies.

Question 7b.

Marks	0	1	Average
%	16	84	0.9

Most students identified a software security measure to protect files on a network. Answers included encryption to prevent hackers from reading data, firewalls to prevent unauthorised access to the network, and login and password software to check the access rights of those using files.

Question 7c.

Marks	0	1	2	Average
%	34	21	45	1.1

Responses that described a procedure followed by users to secure data communicated on a network received marks. Login strategies that include regular changes to passwords or graphic indication of password strength; for example, help to prevent hackers from finding passwords by trial and error or by guessing. Other strategies that received marks included logging out before leaving a terminal, password-protecting or write-protecting files and not sending an encryption key in the same email as an encrypted file. Students needed to describe a procedure and identify a characteristic of effectiveness to gain full marks.

Question 8a.

Marks	0	1	2	Average
%	21	29	51	1.3

Responses included ethical dilemmas affecting the friendship between Kim and Gerry, and the commercial relationships between:

- HipDezigns and all its customers
- HipDezigns and Kim
- HipDezigns and Gerry.

The most frequently stated dilemmas were expressed in terms of HipDezigns' relationship with customers; for example: '*HipDezigns uses deceptive marketing to encourage purchasing and to make a profit when there is no shortage in stock*' and '*tracking by number of visits is not illegal but is being used to support an unethical sales practice*'.

Question 8b.

Marks	0	1	2	3	4	Average
%	12	8	24	16	40	2.6

Most students found it easier to find a positive for Kim who was not being cheated and a negative for Gerry who was being cheated.

Responses that addressed the effects on Kim included:

- Positive: not being manipulated into making an impulsive purchase; she is being presented with the actual product information and being treated with respect.
- Negative: feeling left out when she finds out Gerry is getting special treatment.

Responses that addressed the effects on Gerry included:

- Positive: being encouraged to make a decision about buying instead of procrastinating
- Negative: being manipulated and feeling cheated when he talks to his friend Kim and finds out it was not really the last item.

Question 8c.

Marks	0	1	2	Average
%	19	28	52	1.3

Strategies for resolving the ethical dilemma explained in part a. reflected the general nature of those earlier responses. Examples include:

- if HipDezigns want to keep the monitoring and marketing function they should use the data to identify items in which customers have shown an interest
- promote those items honestly
- stop cheating some customers
- show real-time stock levels to all customers
- treat all customers in the same way.

Question 9a.

Marks	0	1	2	Average
%	27	10	63	1.4

Most students suggested text as the data type for Field3 and stated that the recommendation was appropriate because data elements in that field were a combination of text and numeric types.

Question 9b.

Marks	0	1	2	Average
%	5	26	70	1.7

Students were asked to recommend effective names for each of four fields of a data table that represented paint tins stored in a shop. The most frequent response awarded full marks listed Paint_Colour, Cost_Per_Tin, Paint_ID and Quantity. Responses suggesting alternative names such as Quantity_Available and Paint_Code also received full marks. A significant number of students transposed Field2 and Field3 but were not awarded full marks.

Question 9c.

Marks	0	1	2	Average
%	16	38	46	1.3

Most students clearly explained the importance of using naming conventions in an RDBMS. Typically, they stated that it helps users to quickly understand the meaning of data they are reading, or it prevents confusion when users are creating queries within tables or relationships between tables. For example, a field name 'Paint_Colour' gives users a better idea of what the data represents than a fieldname such as 'Field1'. Others described the process of joining two descriptive words, each starting with a capital letter, to create user-friendly field names. Many otherwise correct responses failed to include an example of a user-friendly fieldname or naming convention.

Question 10a.

Marks	0	1	2	3	4	5	6	Average
%	29	12	17	18	13	8	4	2.2

Students were asked to design a spreadsheet or database to store data about incoming and outgoing calls displayed on a mobile phone screen so that the total cost of calls could be calculated. Many students used Boolean (Yes/No) data types in their designs to distinguish between calls coming in and calls going out, and between voice calls and text messages. Most responses used a numeric (integer) data type for call duration. A frequently accepted correct response is shown below. Other designs and naming formats that solved the problem were also accepted.

Column or field names	Column or field data types
CallTime	Time
CallDate	Date
CallTypeIn	Yes/No (Boolean)
CallNumber	Text/Number
CallType	Text (Message) Voice (phone) Yes/No (Boolean)
CallDuration	Number

A few students used call start-time and call end-time columns/fields with data type Date and Time. In these responses call duration was often calculated in the formula/query created to the answer in part c. These and other innovative designs were also awarded marks.

Question 10b.

Marks	0	1	2	Average
%	46	41	13	0.7

Students were asked to describe how they could use their design to identify the most frequently called number in one month once the data had been developed. Students were required to constrain the call date to the last 28–31 days and the call type to out. Then they needed to count how many times each call number met both criteria and identify the call number associated with the maximum count. Responses that named reasonable fields, data types, functions and conditions to solve the problem received marks. For example:

RDBMS:

Create a query with conditions on the call date and call type fields `CallDate < Now-28` and `CallTypeIn=No` (out). Count the `CallNumbers` where the conditions are met. Use the `Max` or `Sort` function to list the associated `CallNumber`.

Spreadsheet:

Create a formula in a new column called `CountIfIn=No` with a condition on the call date `CallDate < Now-28` and `CallTypeIn=No`. Apply the `Max` or `Sort` or `Mode` function to the range of cells in this column and highlight the associated `CallNumber`.

Question 10c.

Marks	0	1	2	3	Average
%	27	36	29	7	1.2

Students were asked to explain how they could use their solution to calculate and display the total cost of outgoing calls if they were charged at \$0.08 per minute. They were required to constrain the call type to out, total the durations of those calls and multiply the total time by 0.08. They were also required to display the total cost. Responses that named reasonable fields, data types, functions, a condition and a display label to solve the problem received marks. For example:

RDBMS:

- Label a report `CostCallsOut`.
- Set a condition on the call type field `CallTypeIn=No`. Total the `CallDuration` and multiply by 0.08.

Spreadsheet:

- Label a cell `Cost of Callouts $` and return the answer to the adjacent column.
- Identify the callouts with an `IF CallTypeIn=No` formula.
- Use `Sum` for the durations of the callouts and multiply by 0.08.

Question 10d.

Marks	0	1	2	Average
%	78	13	10	0.3

Students were asked to recommend a strategy to evaluate the effectiveness of their solution. A solution is evaluated after it has been implemented. Many students mistakenly recommended a strategy for testing their solution; that is, during the development stage. Marks were given for responses that stated that the strategy would apply after the solution had been up and running, and that through a survey or a complaints log the accuracy/timeliness/completeness or user-friendliness of records could be checked. Examples included:

Track the number of complaints about inaccurate bills over a six-month period

Have an online survey for customers after months. Ask if bills are accurate. Ask if their bill is easy to understand.

Question 11a.

Marks	0	1	2	Average
%	30	9	61	1.3

Most students correctly recommended Yes/No (Boolean) as the data type for the field that collects data on the acceptance of club rules, stating that it ensures users can only enter one or the other of two options. A number of students recommended controls such as radio buttons. If they justified this as for a Yes/No (Boolean) data type they received a mark.

Question 11b.

Marks	0	1	2	3	Average
%	23	21	29	27	1.6

Responses that described an input mask or similar designed to accept 10 digits spaced into correct groupings and with an appropriate error message received marks. Justifications included: it gives an error message if the length is wrong, and the spaces make it easy for users to read the number and check it as they enter it. Responses that suggested restricting the number of digits to 10 also received a mark.

Question 11c.

Marks	0	1	2	3	Average
%	33	23	23	20	1.3

Testing strategies that advised the developer to follow three or four appropriate steps generally received full marks. Typically, the steps were:

- create a table with dummy data and expected results
- enter the dummy data into the solution and record the actual results
- check that expected results and actual results are the same and correct any errors.