2017 VCE Computing: Informatics examination report

General comments

The 2017 VCE Computing: Informatics examination was the second examination based on the *VCE Computing Study Design 2016–2019*. The 2017 examination contained three sections: Section A – Multiple-choice questions, Section B – Short-answer questions and Section C – Case study.

Section A was answered well. The first five questions of this section focused on a user flow diagram. This was challenging for some students. Areas that students performed well in related to validation, project management and disaster recovery plans.

In Section B students demonstrated that they understood primary and secondary data, including the coding of qualitative data, and many students provided well-thought-out answers to questions relating to this. Responses were also strong in the areas of ethical dilemmas, generating design ideas and security controls.

While students demonstrated some understanding of what design principles are, it was clear from their responses that many were confused between what a design principle is (Section C, Question 5) and what a convention is (Section B, Question 7). The design principles are clearly identified in the study design as useability, including robustness, flexibility and ease of use, and accessibility, including navigation and error tolerance, alignment, repetition, contrast, space and balance. Conventions relate to what is done to the data and are accepted techniques, for example, using two decimal points or right-aligning numbers. Students need to have a clear understanding of the difference between design principles and conventions if they are to do well on the examination.

Another area in which students need further practice is knowing what the three forms of table normalisation are (Section B, Question 3). Student responses clearly indicated that there is little understanding of what is required in each of the three forms.

Students also need to know what data integrity relates to (Section C, Question 1): timeliness, authenticity, accuracy and relevance. Many students could identify the criteria but could not correctly explain how the criteria support the integrity of data. Student responses clearly showed a lack of knowledge in this area.

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

Question	% A	% B	% C	% D	Comments
1	2	4	5	90	
2	52	3	23	21	Options B and D will not protect privacy. Option C will protect data only on the quick quote form (home page), not data entered on the review page.
3	6	15	23	56	Option A relates only to appearance; in Option B, 'alignment' also refers to appearance. Both Options C and D related only to functionality, but in this user flow diagram (UFD) there is no indication of 'ease of use'. However, it does deal with entry error (error tolerance), and the 'clicks' are all about navigation.
4	12	56	3	28	Phone numbers are not numbers for calculating; they can contain non-digit characters and may need leading zeroes – so Option A was incorrect. Option C was incorrect as a postcode would never be Boolean. To distinguish between Options B and D, the key word was 'any' versus 'only'. A person's name may contain non-alpha characters (e.g. hyphens, an apostrophe), so Option D was incorrect.
5	89	3	2	7	
6	94	4	1	1	
7	4	71	7	18	
8	8	73	7	13	
9	2	5	8	85	
10	84	5	8	3	
11	3	74	7	15	
12	11	3	81	5	
13	13	6	77	4	
14	15	14	21	49	Option B was incorrect because it related to the hypothesis, not the end solution. Options A and C were both past tense and about something that is up and running (that is, the solution, not the design idea).
15	8	16	45	31	After creating a page, the button should be clicked to check if the video plays (Option C). There is no point in doing any of the others if the video does not play on/in your development system in the first place.

Question	% A	% B	% C	% D	Comments
16	4	3	55	38	The Act deals with personal information, not health information, so Options A and B were incorrect. The Act deals with the Victorian public sector, not private companies, so Option C was correct.
17	10	25	34	31	The rule least applies to goal sets 2 and 4, and most directly applies to 1, 3 and 5 (Option B).
18	3	38	11	48	Cloud storage is not always available (e.g. connections can be lost, servers can be down), so Option B was incorrect.
19	1	85	10	4	
20	66	5	25	4	

Section B – Short-answer questions

Question 1

Marks	0	1	2	Average
%	42	30	29	**0.9**

The most common accepted response was: when a Likert scale response has been given, the respondent can be asked to supply a reason for that response in more detail.

Students could explain the difference between qualitative and quantitative data but they struggled to explain how qualitative data supported quantitative data.

Question 2a.

Marks	0	1	2	Average
%	21	43	37	**1.2**

The most common accepted response was: copyright and/or intellectual property laws may prevent you from using the data obtained by others and you may need permission to use the data but cannot get the permission.

Many students could identify what a legal issue was but struggled to explain how it could be a constraint on the acquisition and use of secondary data.

Question 2b.

Marks	0	1	2	Average
%	20	35	45	**1.3**

The most common accepted responses were: contact the owner/creator and request their written permission to use the secondary data and acknowledge the owner/creator using an appropriate referencing method, for example, APA or Harvard.

Question 3a.

Marks	0	1	Average
%	55	45	**0.5**

Students were asked to state why the data was not in first normal form. It was clear from students' responses that a large number did not know what first normal form is. Students who could identify that the CommonName or speciesName field had more than one value in it were awarded the mark.

Question 3b.

Marks	0	1	2	Average
%	74	17	9	0.4

Students who obtained full marks were able to state that the 'state' field is dependent on the 'postcode' field and that in third normal form, all fields must be dependent only on the primary key. Students who only indicated that fields needed to be dependent on the primary key, but could not state which ones were awarded one mark.

Question 4

Marks	0	1	2	3	4	Average
%	26	26	30	14	4	1.5

Students who obtained full marks were able to identify that Richard needed to create codes – for example, high, medium and low for the food, service or atmosphere – then translate the opinions into the codes; once in codes the data could then be graphed via a sum or a count formula.

Marks were awarded for suggesting to codify the data, manipulating the data from the codes, identifying the specific issues in the question (food, service or atmosphere) and suggesting what kind of pattern or trend the manipulations might find (graph).

In most cases, students who did not obtain full marks missed one or more of the four components.

Question 5

Marks	0	1	2	Average
%	37	27	36	1

To obtain full marks, students need to state: because the rocks have been there for millions of years, there is little chance of them moving, therefore they needed to know that the data was accurate and it would not matter as much if the data was not timely.

Many students argued that timely data was more important than accurate data; they received no marks for that response.

Question 6a.

Marks	0	1	Average
%	46	54	0.6

Students were asked to outline an ethical dilemma related to storing all staff details, including salaries and earnings from sales. Student responses that gained a mark mentioned that all staff have access to their colleagues' personal and sensitive data. To gain the mark, students needed to mention that there was some form of conflict present.

Students who mentioned that it was breaking the privacy laws or was illegal did not obtain any marks.

Question 6b.

Marks	0	1	Average
%	28	72	0.7

Students needed to link their answer to Question 6a. Common accepted responses were: assign permissions to different sections of the network depending on the role of the person in the organisation; ask people if they are happy to have their data viewed by others; password-protect the files.

Question 6c.

Marks	0	1	2	Average
%	33	44	23	0.9

Common accepted responses were: what to do if there is a loss of the internet and/or cloud services; how to get the infrastructure up and running again if damaged by a disaster (e.g. fire or flood); evacuation of staff in the case of an emergency; speed and cost of restoring data; the completeness of the data once restored.

Most students were able to identify aspects of a disaster recovery plan. Not all were able to satisfactorily outline two important aspects.

Question 7a.

Marks	0	1	2	3	4	Average
%	38	11	25	9	17	1.6

Students who obtained a high score for this question responded with answers such as: heading hierarchy – headings should be 'stronger' than the body text, larger size, different colour or font; hyperlinks need to be a different colour (usually blue) and/or underlined; body type should be the same size and style with the use of CSS.

A large proportion of students misunderstood what was being asked of them in this question. Students who scored low marks usually confused conventions with design principles or identified a convention that was outside of the area between A and B.

Question 7b.

Marks	0	1	2	3	4	Average
%	22	13	26	11	28	2.1

Accepted responses were: culturally inclusive; with a commonality of language; age appropriate.

Students who suggested the ability to change the language of the web page did not receive any marks.

In general, this question was answered well. A significant number of students were able to identify two characteristics, although many were not able to link them to educating worldwide audiences.

Question 7ci.

Marks	0	1	Average
%	43	57	**0.6**

Most students who answered this question received the full mark. Students who gained the full mark demonstrated knowledge of web page folder structures by indicating at least two folders, one for text (html) and one for images (pictures).

Question 7cii.

Marks	0	1	2	Average
%	49	31	20	**0.7**

Accepted responses included the following, with an explanation as to why each is helpful:

- all text files begin with txt and all image files begin with img, which allows for easy recognition of file type
- camel case
- no spaces between words
- YearMonthName of page.

Many students either did not know what a file-naming convention was or could not explain how the convention was helpful to finding files quickly.

Section C – Case study

Question 1a.

Marks	0	1	2	Average
%	49	19	32	**0.8**

Students were asked to identify one criterion that could be used to support accepting the offer. Acceptable answers were authenticity, accuracy or relevance.

Students who gained full marks suggested that the data was authentic, accurate or relevant because the data came from his university lecturer, the data should be accurate, so there is no need to question the integrity of the data.

Question 1b.

Marks	0	1	2	Average
%	65	22	13	**0.5**

The correct answer was relevance, as the data was from the 1980s and about pinball machines – that is, the data is from a long time ago and is about a different game.

Students who suggested timeliness did not receive any marks. Data that has not arrived in the right time frame is not relevant, as the data referred to in the question had been there a long time and whether it arrived on time or not is not relevant.

Question 2

Marks	0	1	2	3	Average
%	14	43	32	11	**1.4**

Students expected to discuss the legal implications for Anthony and the legal implications for his friend. Many students stated a legal implication for either Anthony or his friend, but not both.

Accepted responses included:

- the data is not his friend's to give away
- even if the data was his friend's to give away, there are privacy issues involved; if the data included personal health and/or medical information, then the *Privacy Act 1988* could be involved
- *Copyright Act 1968* may be contravened, as the data is the property of the university and may not be able to be used without permission.

Question 3

Marks	0	1	2	Average
%	28	41	31	**1.1**

Generally, students understood what was needed to answer this question. Students who could explain what data needed to be entered and how it should have been manipulated gained full marks.

Accepted responses suggested that the data should be codified using a range (for example, high/medium/low or 1–5) and entered into the spreadsheet for counting.

Question 4a.

Marks	0	1	Average
%	41	59	**0.6**

The most common accepted answers were brainstorming and mind maps.

Students who completed this question answered it well.

Question 4b.

Marks	0	1	2	Average
%	70	16	14	**0.5**

Accepted responses included:

- Will the online report clearly set out the conclusion and evidence?
- Does the idea communicate the message?
- Does the idea allow the user to interact with the solution?

Responses to this question indicated that students did not know what a criterion was.

Question 5

Marks	0	1	2	3	4	Average
%	22	4	21	11	42	**2.5**

This question asked students to identify two design principles relating to appearance and provide evidence of this. Students who gained full marks listed one of the correct design principles

(alignment, repetition, contrast, space or balance), with the most common response being alignment. Students were then able to discuss how that design principle related to the screenshot.

Possible responses included:

- alignment – left alignment of text; right alignment of image and text; top and bottom alignment
- repetition – repetition of fonts and colour in headings
- contrast – contrast between headings and body text; contrast between background and foreground (text)
- space – the grouping of sections into the four corners of the page creates space to clearly delineate each section
- balance – 'symmetrical' left–right, top–bottom balance around centre horizontal space (or the 'Read more!' and 'Listen to interviews' heading).

Responses relating to repetition were not strong; students needed to show that they knew what repetition means.

While many students gained full marks for this question, it was clear from student responses that they again confused design principles with formats and conventions.

Question 6

Marks	0	1	2	3	Average
%	13	40	39	9	**1.5**

This question asked students to outline a set of tests that should be performed.

Accepted responses included:

- click on the left and right buttons to see if a new picture loads
- click to the right until the last photo and then click one more time to make sure either photos wrap around or nothing happens
- test with a different browser
- test on different devices.

Responses that stated 'click on the left button to see if a new picture loads' and 'click on the right button to see if a new picture loads' as two different tests were awarded only one mark, as it is the same test.

Question 7

Marks	0	1	2	3	4	Average
%	12	19	31	27	10	**2.1**

Students were asked to explain what this portion of the Gantt chart showed about Anthony's progress at the time.

Anthony started the task three days behind schedule and finished one day after the planned completion. This means he missed a milestone; however, he did make up time because the original plan was that the task should take six days but he did it in four days.

Many students did not obtain full marks, as they did not discuss the milestone and/or that he made up time.

Question 8a.

Marks	0	1	2	3	Average
%	13	13	32	42	2

Three sets of controls were required to be drawn on the mock-up:

- 1. A text box, drop-down list or radio buttons – There should have been an indication of the 10 limit: the text box should have had a caption telling the user of the limit; the drop-down list should have included the limit in annotation or caption; the radio buttons needed to be 10 or give some indication that there will be 10
- 2. Two controls, both text boxes – the first for contact number and the second for email (indicating that is it optional for the customer to enter the email address)
- 3. A button with a caption indicating what it is

Students also needed to indicate that the number of people and contact number were required fields.

Most students who responded to this question did very well.

Question 8b.

Marks	0	1	2	Average
%	38	33	28	0.9

This question required students to refer to design principles relating to functionality (useability, including robustness, flexibility and ease of use, and accessibility, including navigation and error tolerance).

The most common correct responses were:

- Ease of use with the drop-down box, as only selected options are allowed and you don't need to type anything.
- Drop-down boxes and radio buttons reduce error tolerance because unlike a text box they only allow a particular option to be selected.

Many students incorrectly referred to navigation as an appropriate design principle. While it does relate to functionality, navigation was not appropriate in this circumstance.

Question 9a.

Marks	0	1	Average
%	40	60	0.6

Students clearly understood why the field ContactNumber should be a text field. Most students suggested that telephone numbers may contain alphanumeric characters or telephone numbers will not be used for calculations so therefore do not need to be an integer.

Question 9b.

Marks	0	1	Average
%	54	46	0.5

The most common correct response was numeric, because both fields will contain numbers that will be used in calculations.

Question 9c.

Marks	0	1	2	Average
%	65	10	25	**0.6**

The correct response was:

At X: Many

At Y: One

Question 9d.

Marks	0	1	2	3	Average
%	44	8	20	29	**1.4**

Students were asked to state the two fields that should be added as foreign keys and explain their purpose. Acceptable responses were the following (or vice versa):

Field 1: PlayerID, Field 2: GameID

Purpose: To provide the link between table PlayerStatistics and the other two tables/to show the relationship of each player to each game

Question 10a.

Marks	0	1	2	Average
%	55	27	18	**0.7**

It was clear from the responses that a significant number of students did not know how to correctly test a query. Many students just repeated the condition being tested that had already been included.

Many students indicated a condition being tested as 'player too young'. The query was asking only for students who were under 18, so no marks were awarded for this response.

The following is an example of a possible response.

Condition being tested	Data input	Expected result of query
player too old	PlayerID 12345 YearOfBirth 1998	PlayerID not included in output
player less than 18 years old	PlayerID 12345 YearOfBirth 2010 (or later than 1999)	PlayerID included in output
player equal to 18 years old	PlayerID 12345 YearOfBirth 1999	PlayerID not included in output

Question 10b.

Marks	0	1	2	Average
%	45	10	45	**1**

Students were asked to complete the process column in the IPO chart by showing what the query needed to do to obtain the required output.

The most common correct response was:

Input	Process	Output
PlayerID ZombiesZapped TimesEaten	Points = ZombiesZapped * 5 – TimesEaten * 10	PlayerID PlayerScoreForGame

Question 11a.

Marks	0	1	Average
%	33	67	0.7

The most common answer was lockable doors to the file server.

Most students were able to identify one physical security control.

Question 11b.

Marks	0	1	2	Average
%	42	13	45	1.1

Students were asked to identify one weakness in the physical security provided for Zombie Pursuit's information system and explain the threat it presents. The most common acceptable answers were:

- Windows onto laneway do not appear to have bars. Someone could break in through them and steal data or equipment.
- One of the desktop computers and its printer is in a public space, and it is always left logged in. If left unattended, private information could be seen on paper or screen or USB ports could be accessed.

Question 12a.

Marks	0	1	2	Average
%	32	37	32	1

Students were asked to identify one strength of Zombie Pursuit's backup procedure compared with Isha's and explain why it is a strength. In general, students were able to identify a strength but many struggled to compare it with Isha's backup procedure.

The most common acceptable response was: Zombie Pursuit makes a backup every night, while Isha makes only one a week. If something goes wrong, Zombie Pursuit will only lose one day's worth of data while Isha could lose a week's worth of data.

Other acceptable strengths were:

- backup stored on media
- quick to access in event of restoration required
- no DVD left around with easily retrievable data.

Students could not get full marks if they did not compare Zombie Pursuit's backup procedure to Isha's backup procedure.

Question 12b.

Marks	0	1	2	Average
%	27	40	33	1.1

Students were asked to identify one strength of Isha's backup procedure compared with Zombie Pursuit's and explain why it is a strength. Students struggled to compare Isha's strength with Zombie Pursuit's backup procedure.

The most common acceptable response was: Isha's backups are stored in the cloud while Zombie Pursuit's are stored on a DVD in the office. This means that if there is a disaster – for example, the businesses burn down – Isha's data will be safe, while Zombie Pursuit will lose theirs entirely.

Other acceptable strengths were:

- backup not stored onsite but in the cloud
- if site destroyed, data is not lost
- backup not left in PC all day.

Students could not get full marks if they did not compare Isha's backup procedure to Zombie Pursuit's backup procedure.

Question 13

Marks	0	1	2	3	4	Average
%	18	9	25	34	14	2.2

Students were asked to decide whether Zombie Pursuit or Isha had the more effective procedure and justify their answer with regard to disposal of data and protection from malware.

While a large number of students were able to indicate the right procedure, many were not able to justify why it was the more effective procedure. To gain full marks students had to identify who had the most effective procedure and in justifying why it was the most effective procedure give a statement including one of the following: integrity of data, security of data, ease of retrieval or currency of files.

Disposal of data

The most common acceptable response was: Isha's is the most effective procedure because data is deleted from the disk and even if that's not necessarily permanent the disk drive is not open to the public, therefore it is secure. Elena (at Zombie Pursuit) does not destroy the DVDs; just putting them into the bin means that they could be picked up by anybody and possibly private data could be released to the public.

Other acceptable reasons if choosing Isha's procedure were:

- data not deleted out of Zombie Pursuit's storage
- only the backup is disposed of. DVD destruction is not guaranteed.

Protection from malware

The most common acceptable response was: Zombie Pursuit's is the most effective procedure because a virus scan is run on any file before it is opened and a full scan is run every night. But this is only on the file server. The desktop computers are open to virus attack, especially through the USB ports. But if all of Zombie Pursuit's important data is on the file server it should be safe, compared with Isha's. All her important data is on a disk that gets scanned only once a week, leaving a great opportunity for a virus to gain access to the system (security of data) and if it does it could destroy important data.

Other acceptable reasons if choosing Zombie Pursuit's procedure were:

- file server is scanned daily on every file before opening
- updates performed daily; Isha doesn't do any updating of software, which could be high risk to data.