

2019 VCE Computing: Informatics examination report

General Comments

The 2019 VCE Computing: Informatics examination applied to the final year of the VCE Computing 2016–2019 study design. The examination contained three sections: Section A (Multiple-choice questions), Section B (Short-answer questions) and Section C (Case study).

The multiple-choice questions were answered well. Areas in which students performed well were folder structure, design principles and security. Students had some difficulty with questions on project management and protocols.

It was evident in student responses to the short-answer questions that students understood conventions with regards to icons, testing techniques, statements required in a privacy policy and security. Responses were also strong for questions on project management, data types and the supply of data.

One area for improvement is students' understanding of the aspects of data integrity. While students could identify these aspects, too many used the wrong definition in their answers. For example, many thought that timeliness refers to when the data was first created/gathered, rather than when data is gathered in relation to the current project,. Students need to be familiar with the terminology used within the study.

Another area for improvement is the writing of evaluation criteria (Section C, Question 7c.). While an evaluation criterion does not have to be in the form of a question, it may assist students who struggle with the concept to formulate one. Evaluation criteria must be measurable; however, a large number of students made criteria statements that were not measurable, and therefore could not be awarded marks.

Table normalisation (Section C, Question 6b.) is a significant part of the Informatics course and it is important for students to know how to normalise data to its third form (3NF).

Two further areas that students need to address are:

- When answering a question that requires students to justify a selection or action identified, the response must explain the basis of the selection or action to gain full marks. It was clear that students did not understand this requirement and many lost marks as a result.
- When quoting from legislation, students must include the full name of the Act and the correct year.

Students are advised to remove the detachable insert during reading time. Students may find it easier to refer to the Case study when it is separate from the question and answer book.

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	7	89	1	2	
2	2	0	74	24	Option C is the only structure that includes all the required files.
3	85	9	2	4	
4	0	0	8	91	
5	76	7	8	9	
6	8	5	8	78	
7	1	93	3	3	
8	6	80	12	2	
9	5	2	87	5	
10	1	5	13	81	
11	2	2	4	92	
12	37	54	7	1	Option B is not correct as the solution is not evaluated before launching the MMOS. Option A has all the tasks in the correct order; options C and D do not.
13	1	19	5	75	
14	20	8	67	4	Option A is not correct as internet protocols do not protect the data, security protocols do (option C).
15	79	9	11	1	
16	3	84	9	4	
17	2	15	81	2	
18	18	77	2	3	
19	9	2	72	17	Option C is correct as it is the only answer relevant to the online experience.
20	88	2	7	3	

Section B

Question 1a.

Marks	0	1	Average
%	17	83	0.9

Students who obtained the mark had to both mention a specific icon and explain that it would have caused confusion because it was not a conventional icon.

Question 1b.

Marks	0	1	2	3	Average
%	22	44	29	5	1.2

For students to gain full marks they needed to mention the impact on the users of the convention not being followed (one mark) and reference two relevant points explaining the impact on the user (two marks).

Possible answers could have included:

- look at other popular worldwide recognised symbols before designing his
- there could easily be confusion as it is not a common icon
- ask typical users what they would like or expect
- common icons will achieve the purpose quicker than the non-common icons.

Question 2

Marks	0	1	2	Average
%	61	26	13	0.5

Students who could identify any one relevant characteristic of MMOS effectiveness (completeness, readability, attractiveness, clarity, accuracy, accessibility, timeliness, communication of message, relevance or usability) gained one mark. To obtain the second mark, students needed to have selected the correct characteristic – accessibility or attractive – and made a clear link to the design choice.

A suggested response could be as follows.

Accessibility is important as Connie's findings will be published on her MMOS and every one across the world will have access to it.

Question 3a.

Marks	0	1	2	3	Average
%	63	22	12	3	0.6

Students were asked to identify one reason why Trinh should code the data she collected and suggest two techniques that Trinh could use to code the data.

Responses that gained full marks explained why the data needed to be coded, for example, to make non-numeric data easily chartable/measurable, easy to graph or to identify trends. They also suggested two techniques that Trish could use, such as counting the number of trees (living or dead) in each photograph or counting the number of tree type/health in each photograph.

Students who suggested one technique only did not gain full marks.

The following is an example of a possible high-scoring response.

The data needs to be coded so that it is converted to numbers, which are easier to chart. Trinh could use the captions on each photograph to count the number of different types of trees and tree type/health in each photograph.

Question 3b.

Marks	0	1	2	3	Average
%	37	29	29	5	1.1

To gain full marks students needed to describe how Trinh could manipulate this coded data to identify patterns over the last 20 years and explain why this would be clearer than showing people the original photographs.

Responses that obtained marks mentioned:

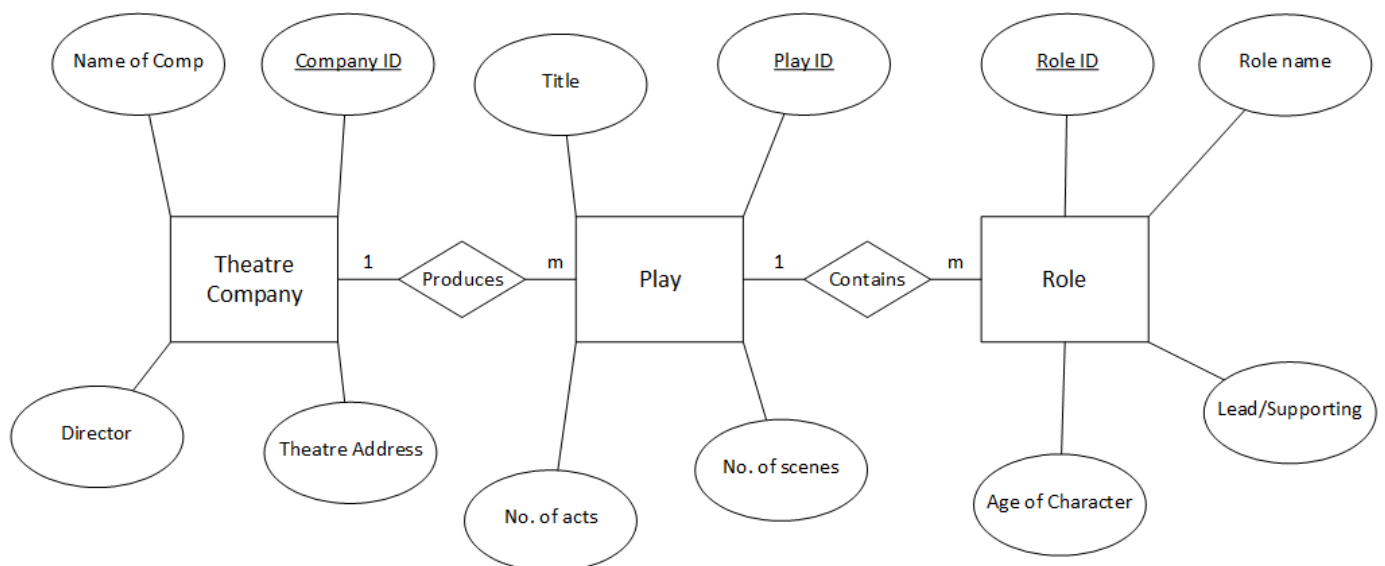
- creating a chart/graph/data visualisation using software
- following appropriate conventions for graphs/charts/data visualisation
- it is easy to quickly see pattern in a line/bar graph in comparison to photo
- counting of the trees.

The following is an example of a possible high-scoring response.

Trinh should create a chart/graph using a spreadsheet with two axes to compare the year to the number of trees in each photograph. This is better than only having the photographs as any decline in tree numbers or their health would be immediately obvious through trend lines.

Question 4

Marks	0	1	2	3	4	Average
%	54	20	13	7	6	0.9



One mark was allocated for each of the following:

- correct format of ERD, with logical entities' names and clear relationships
- logical attributes: accepted variations of the attribute had to be used; ID included
- indications of correct Primary Keys needed to be clear, by underlining or adding an asterisk (*)
- correct cardinality (for Theatre Company to Play, both M to M and 1 to M were accepted).

Question 5a.

Marks	0	1	2	Average
%	20	65	15	1.0

Students were asked to complete a partial testing table. One mark was given for each action. All three boxes of the action had to be answered correctly to obtain the mark.

	What was tested	How it was tested	Expected result
Action 1	Contact link/button from home page Response must mention button or link.	Click the contact link on the home page.	Opens the contact page.
Action 2	Contact form/submit button on contact details webpage Response must mention button.	Complete contact form details such as: 'Name', 'Message', and 'Contact information' and click 'Submit' button. Will accept clicking Submit button and variations of test data.	Send email information to HR department with details of contact data.

Question 5b.

Marks	0	1	Average
%	49	51	0.5

Responses that gained the mark included these reasons:

- to make sure that the solution performs as intended
- to test for browser and device compatibility.

Question 6a.

Marks	0	1	2	Average
%	31	52	17	0.9

The most common responses that gained marks were:

- that is was a legal requirement
- gave confidence to the customer that the organisation is doing the right thing
- explained clearly how the organisation is storing the customer data.

Many students were confused about what a privacy policy is. Students who stated that the privacy policy is needed for customers to know their rights received no marks. A privacy policy states how the organisation is going to deal with the collected data, not what the rights of the customer are.

Question 6b.

Marks	0	1	2	Average
%	24	50	26	1.0

Students gained marks for statements that included:

- what data is being gathered
- how the data is going to be used
- the disclosure of data
- the security of the data.

One mark was given for each statement. To obtain two marks the statements had to relate specifically to the question; generic statements received only one mark in total.

Many students were confused about the difference between a privacy policy and a consent form. Statements that referred to getting permission to have data collected received no marks.

Question 7

Marks	0	1	2	3	Average
%	19	37	38	6	1.3

Students needed to reference one of the Australian Privacy Principles (one mark) and explain two issues (one mark each) that related to that Australian Privacy Principle. They did not need to reference the number of the principle.

Answers could have included issues such as:

- the tablet can be stolen
- the tablet has no password
- access to the data is not reasonably secured
- the data may be used by unauthorised persons
- the data may be used in ways that the owners did not agree to
- unauthorised access
- no consent was given.

Question 8a.

Marks	0	1	2	Average
%	37	37	26	0.9

Students were asked to explain how the integrity of the data and information on the external hard drive had been compromised by an unauthorised access.

One mark was given for naming the correct data integrity term (accuracy or authenticity) and one mark for explaining how this term affected the integrity of the data and information.

A suggested response could be as follows.

Data integrity of the game statistics has been compromised as some files have been altered and deleted. The accuracy of the data was affected.

Question 8b.

Marks	0	1	2	Average
%	25	48	27	1.0

Students needed to outline two ways that Jarman could have prevented this unauthorised access.

Any two of the following gained a mark each.

- Protect each file with a password so that data cannot be modified or deleted.
- Do not use an external hard drive that can be easily accessed by anyone.
- Don't have work experience students handling the files that are sensitive to the business.
- Access hierarchy/use permissions, so only the correct person can get access to the files.
- Encrypt the file or folder.
- Remove external hard drive to a safe place.

Responses that suggested usernames and password for logging onto the network or computer gained no marks.

Section C

Question 1a.

Marks	0	1	2	Average
%	51	40	9	0.6

Students were asked to write a hypothesis outlining a prediction that can be tested using the data Pranesh and Carolyn collect from the survey. One mark was gained for writing a hypothesis as a statement not as a question, and one mark for the hypothesis presented in the format 'more of x leads to more of y due to z'.

A suggested response could be as follows.

Hypothesis: If awareness of dental health is increased there will be more people visiting the dentist due to a greater concern for dental health.

Responses that presented the hypothesis in reverse (negative) but met all the requirements still gained marks; for example, 'A lack of awareness about the importance of good dental hygiene results in less visits to the dentist as the people are unaware of the importance of going to the dentist'.

Question 1b.

Marks	0	1	2	Average
%	48	47	5	0.6

Variable 1: dental health awareness

Variable 2: visiting dentist

No marks were given for responses for Variable 2 which included 'number of'.

Question 2

Marks	0	1	2	3	4	Average
%	29	25	17	11	18	1.7

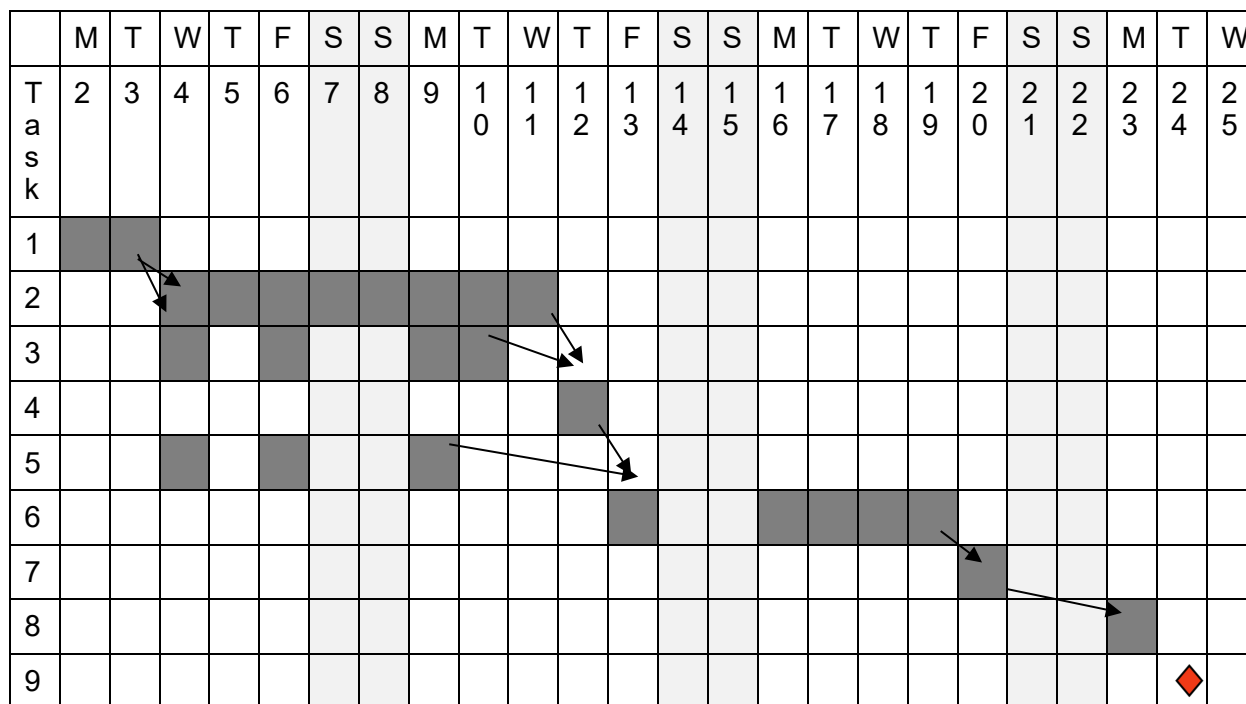
Students were asked to complete a Gantt chart, including task durations, dependencies and any milestones, and taking into account the constraints listed.

One mark each was awarded for:

- correct shading of task durations – pattern intact (online survey can go over weekends and holiday), dependent tasks cannot run during predecessors. Task five can be any time in the durations of the task before task six, but not including Saturdays
- weekends are left clear apart from the online survey
- correct dependencies, no extra ones
- milestone on or before December 24.

Many students did not include the dependencies or the milestones and were unable to obtain full marks.

The following is an example of a possible high-scoring response.



Question 3a.

Marks	0	1	2	3	Average
%	16	24	33	27	1.7

Students were asked to complete a table by giving one example of each type of data that will be collected, and to support each example by explaining why it is needed or how it can be used. To gain marks students had to use a different example for each response, and each explanation had to be relevant to the scenario. Types of data, with examples, could have included the following.

Marks	Details
1	Secondary data Any one of: • dental research online/website • previous studies
1	Quantitative data Such as: • number of fillings

	• age • frequency of dentist visits • reasonable and relevant data that is numeric
1	Qualitative data Such as: • current health of teeth • current general health • interviews • surveys • reasonable and relevant data that is text-based.

Question 3b.

Marks	0	1	2	3	Average
%	70	17	7	6	0.5

Students were asked to name the characteristic of data integrity that would cause the greatest problems for the dentists if they used this list and explain why this characteristic is a concern.

One mark was awarded for naming accuracy as the relevant characteristic of data integrity. This was the only acceptable response. Many students incorrectly selected timeliness and did not receive a mark. Two marks were allocated for the explanation, which had to have two relevant points to gain full marks; for example, 'Wrong addresses means they won't find those people living there, people may have moved house, left town or not be contactable at all'.

Question 4a.

Marks	0	1	2	Average
%	39	31	30	0.9

Students were asked to use an example to describe a naming convention that could be used when naming tables fields. One mark was awarded for a valid naming convention and one mark for a relevant example.

Acceptable naming conventions were:

- Hungarian notation
- camelCase
- no spaces/use of underscores
- descriptive names

The example needed to relate to a database field, for example, use of field names such as 'FirstName' or 'Tooth_Colour'.

Question 4b.

Marks	0	1	2	3	4	Average
%	33	8	18	12	29	2.0

Students needed to describe two different electronic validation techniques (one mark each) and provide an explanation for each technique (one mark each).

Acceptable techniques were:

- existence check
- data type check
- range check
- input mask
- list/combo box.

Acceptable responses were:

- existence check: required field to ensure the field is not accidentally omitted
- data type check to limit entries of the wrong type
- range check to reject unreasonable entries
- input mask to restrict entries to the exact sequence of letters/numbers required
- combo/list box to reduce data entry.

Question 5a.

Marks	0	1	Average
%	51	49	0.5

Students were asked to state one reason why respondents might supply data online to the dentists. A number of students did not relate the reason to the dentist and were awarded no marks.

Responses that gained a mark included:

- chance of a free whitening service
- wanting to help with public health/dentist research
- convenience
- anything else relevant to the case study
- entering your own data for the dentist.

Question 5b.

Marks	0	1	Average
%	45	55	0.6

Students were required to outline another reason people might supply their personal data to other organisations.

Common acceptable responses were:

- greater variety of product/services choice
- 24/7 access
- better/cheaper deals
- access to loyalty programs
- mailing list
- follow up or mark an enquiry
- signing up for membership.

Question 6a.

Marks	0	1	2	3	Average
%	9	31	40	21	1.7

Students needed to complete the following data dictionary by providing the best choice for each empty cell. One mark was awarded for each response (acceptable answers are shown in bold).

Field	Data Type	Description
GivenName	Text	Stores the customer's given name
Surname	Text	Stores the customer's surname name
Address	Text	Stores house number, street name
Town	Text	Stores the town name
Postcode	Text (or string) (number/numeric not acceptable)	Stores postcode of the customer's town
NumFillings	Numeric/integer (number not accepted)	Stores the reported number of fillings the respondent has

Question 6b.

Marks	0	1	2	3	4	Average
%	53	26	14	7	1	0.8

Students were required to normalise the data from first normal form (1NF) into third normal form (3NF). Common errors were: not including Participation ID in both tables, including Age, not including all fields, not indicating the primary key, including generic field names.

The following is an example of an acceptable response.

tblParticipant Participant ID → GivenName Surname Address Postcode PhoneNo DateBirth <i>(Note that Age is removed)</i>		tblDental Participant ID → NumFillings TeethHealth GenHealth NumYearlyCheckups Photo BrushFrequency FlossFrequency NumAches	
Marks	Details		
1	Correct fields in correct tables (<i>Age could be included for this mark</i>); no additional fields		
1	Reasonable table names		
1	Same primary key for both tables (1:1 relationship indication not needed)		
1	Age field removed		

Question 7a.

Marks	0	1	2	Average
%	47	16	37	0.9

The most common acceptable responses for describing one technique that could be used to help the team generate some design ideas were:

- brainstorming – to get lots of ideas on paper, working together to generate ideas
- mind mapping – grouping ideas or breaking ideas into smaller steps
- looking at other sites – to see what does or does not work.

One mark was awarded for identifying the technique and one mark for the correct description of the technique.

Question 7b.

Marks	0	1	2	Average
%	38	40	22	0.9

Students were required to explain why the team should spend time discussing their design ideas with some of the residents. Students needed to explain two clear points.

Acceptable responses included:

- any issues may be picked up before the solution is developed
- typical users may have some other ideas
- users might not like what is being proposed
- any concerns about the data or how it is presented could be dealt with straight away.

Question 7c.

Marks	0	1	2	3	4	5	6	Average
%	31	14	24	10	13	3	4	1.9

Students were required to complete the table provided.

Three marks were awarded for each evaluation criterion:

- One mark for each criterion that directly mentions accessibility in relation to other language options and poor language, ease of use, readability, useability/use of navigation, attractiveness. These can be sentences or questions.
- Two marks for the justification. The justification for the choice had to relate back to the information listed and compare both designs.

No marks were awarded for the judgment section, nor for a one-word criterion or for saying 'quicker' or 'less effort'.

The following is an example of a possible high-scoring response.

- Criterion 1 – Access for non-English speakers
Justification: Design B is better as it has language options, Design A has no clear language options.
- Criterion 2 – Easy navigation
Justification: Design A has icons to show the links rather than the heavy text in Design B.

Question 8a.

Marks	0	1	Average
%	30	70	0.7

Students needed to identify one benefit of preparing a disaster recovery plan. The majority of students answered this question well.

Common acceptable responses were:

- having another copy of the data in case something goes wrong
- keeping the data somewhere else
- sense of security
- provides a clear set of steps to follow if the data is lost/damaged
- keeping people safe
- can recover the data easily if lost
- minimises data loss.

Question 8b.

Marks	0	1	2	3	Average
%	15	26	36	23	1.7

There is no right or wrong answer to this question, but students needed to clearly indicate which backup plan they had chosen. Students then needed to make a statement that justified their decision by stating why they had chosen the backup plan and not the other one.

The majority of responses that gained marks selected Christo's backup plan; for example:

Christos' suggestion is more appropriate, with a weekly full back up and a daily incremental back up. If a disaster happens in the week days, for example, Wednesday, the data can be retrieved from the previous weeks' data. If data is backed up monthly as Carolyn suggested, when the disaster occurs all the stored data from the start of the month will be lost.

Question 9a.

Marks	0	1	Average
%	77	23	0.3

The legislation that has been breached is the *Health Records Act 2001*.

Marks were not awarded if the students did not include the year.

Question 9b.

Marks	0	1	Average
%	42	58	0.6

Students were required to explain how the legislation is being breached.

Common responses that gained a mark were similar to 'The Health Records Act is being breached because survey results have been published identifying individuals with their medical and dental details'.

Students who did not mention medical data in their answer did not receive a mark.

Question 9c.

Marks	0	1	2	Average
%	14	25	61	1.5

Students were asked to give two possible consequences as a result of the breach. The question was answered well.

Responses could have included:

- legal issues
- fines
- being sued
- losing dental licenses
- loss of reputation
- loss of clientele due to trust
- death of the business.

Question 10

Marks	0	1	2	3	Average
%	48	30	17	5	0.8

Students needed to identify the ethical dilemma that Christos faces and recommend a strategy that Pranesh and Carolyn could use to resolve the issue with Martha.

Responses were awarded one mark for identifying the dilemma, one mark for stating that Pranesh and Carolyn needed to decide on the strategy and one mark for the strategy. To receive full marks the strategy must relate to the scenario.

The most common misconception with this question was that students did not realise that it was Pranesh and Carolyn who needed to make the decision. Many students suggested that Christos should do something about the dilemma. These students didn't receive marks for this part of the question.

The following is an example of a possible high-scoring response.

Christos needs to decide whether to tell Martha and/or the dentists what he has found out. Pranesh and Carolyn could make a list of pros and cons to help them decide what the right thing to do is. They could talk with Martha and help her to decide to tell them that she has been dishonest. They could then come to a compromise together to reduce her working hours so that she can still have spa trips.