



# Information Technology: Software Development 2007–2010

## Written examination – End of year

### Examination specifications

The examination will be sat at a time and date to be set annually by the Victorian Curriculum and Assessment Authority.

There will be 15 minutes reading time and 2 hours writing time.

VCAA examination rules will apply. Details of these rules are published annually in the *VCE and VCAL Administrative Handbook*.

The examination will be marked by a panel appointed by the VCAA.

The examination will contribute 50% to the Study Score.

### Content

All outcomes in Units 3 and 4 will be examined. All of the key knowledge and skills that underpin the outcomes in Units 3 and 4 are examinable. Aspects of some outcomes that require the use of computers will not be examined; however, underpinning key knowledge associated with the practical aspects is examinable.

Both Units 3 and 4 will contribute approximately equally to the examination.

### Format

The examination will consist of three sections:

Section A	20 multiple-choice questions worth 1 mark each	20 marks
Section B	Short answer questions	20 marks
Section C	Case study worth 50–60 marks which can comprise a range of question types including short answer, multiple-part answer and extended answer	50–60 marks
	Total marks	90–100 marks

The examination paper may include questions which refer to stimulus material such as design briefs, case studies and visual images. All questions are compulsory.

The examination will be in the form of a question and answer book.

Answers to Section A will be recorded on a multiple-choice answer sheet.

Sections B and C are to be answered in the spaces provided in the question and answer book.

### Approved materials and equipment

- Normal stationery requirements (pens, pencils, highlighters, erasers, sharpeners and rulers)
- One scientific calculator.

**Advice**

During the 2007–2010 accreditation period for VCE Information Technology: Software Development, examinations will be prepared according to the examination specifications above. Each examination will be an interpretation of these specifications and will test a representative sample of the key knowledge and skills.

Teachers should refer to the *VCE Information Technology Assessment Handbook 2007–2010*, p.51, for the examination criteria.

The following sample questions are intended to demonstrate:

- the format of the new multiple-choice section
- types of questions which may be asked for new aspects of Units 3 and 4 of the revised study design.

They do not form a complete sample examination paper. Many items from previous VCE Information Systems examinations remain relevant when preparing for the VCE Software Development examination. Teachers and students should be aware that the terminology used in the examination will be in accordance with the definitions provided in the IT Glossary in the revised study design.

## Sample examination questions

### SECTION A – Multiple-choice questions

#### Instructions for Section A

Answer **all** questions in pencil on the answer sheet provided for multiple-choice questions.

Choose the response that is **correct** or that **best answers** the question.

A correct answer scores 1, an incorrect answer scores 0.

Marks will **not** be deducted for incorrect answers.

No marks will be given if more than one answer is completed for any question.

#### Question 1

WAP stands for

- A. Wireless Application Program.
- B. Wireless Application Protocol.
- C. Wireless Administration Protocol.
- D. Wireless Administration Program.

#### Question 2

Andrew wishes to design games for hand-held PCs and mobile phones.

Which combination of features below are the most important for Andrew to consider?

- A. screen size, weight and operating system
- B. screen resolution, device size and processor speed
- C. device size, device weight and processor speed
- D. screen resolution, processor speed and memory size

#### Question 3

Robert was hired to create a new purchasing system. He completed the project in the following order.

- analysed the existing system
- designed a new system
- wrote the code
- bought the hardware
- built the system

After testing he presented the new system to the client.

This methodology is an example of the use of

- A. prototyping.
- B. an agile model.
- C. the waterfall model.
- D. rapid application development.

**Question 4**

When performing a desk check on an algorithm, which type of error is being checked?

- A. logic
- B. syntax
- C. runtime
- D. programming

**Question 5**

You have purchased a new hand-held PC with the following specifications: 312 MHz processor, 128 MB memory, screen resolution  $320 \times 320$ , including Bluetooth and Infrared.

Bluetooth and Infrared are examples of which one of the following?

- A. data communication methods over long distances
- B. voice communication methods over long distances
- C. data communication methods over short distances
- D. voice communication methods over short distances

**Question 6**

*This software cannot operate by itself but must be activated by a user – usually the victim. Once active, it may carry out tasks such as sending out information about the computer, allowing remote access to the computer, or corrupting files on the hard disk.*

What kind of malicious program code is described above?

- A. spyware
- B. trojan
- C. virus
- D. worm

**Question 7**

The main disadvantage of using the waterfall model in managing the Systems Development Life Cycle (SDLC) is that

- A. it is difficult for software engineers to manage.
- B. no testing occurs until after analysis and design are complete.
- C. it is impossible to get one phase perfected before moving on to the next.
- D. it takes so long that the new system is out of date by the time it is complete.

**Question 8**

MyGift, a mail-order gift company, is setting up an online purchasing system. It will allow customers to access a catalogue via the Internet and place an order. The catalogue and customer order details will be stored in a database.

Which three security devices and/or procedures must be employed by MyGift to prevent the loss of some or all of its data?

- A. antivirus software, firewall, data encryption
- B. firewall, data encryption, backup procedures
- C. antivirus software, firewall, backup procedures
- D. antivirus software, data encryption, backup procedures

**Question 9**

Which one of the following is characteristic of a high quality user interface?

- A. places all functions in menus.
- B. uses a range of attractive fonts and colours.
- C. has all items grouped as closely together as possible.
- D. has consistent labelling, button placement and navigation.

**Question 10**

An important database requires a date of birth to be entered for all new records. Some input errors have been detected. For example an entry was 14/05/2991 when it should have been 14/05/1991.

Which one of the following validation techniques should have been used to prevent this data entry error?

- A. data type check
- B. existence check
- C. format check
- D. range check

**Question 11**

An architectural firm uses computers to create building plans which have an average file size of 500 KB each. There are currently 2000 of these files stored on its file server but the firm wishes to archive these files to a portable storage medium that will be kept in its safe.

How much data will need to be stored on the portable storage medium?

- A. 1 GB
- B. 1 MB
- C. 10 GB
- D. 10 000 000 KB

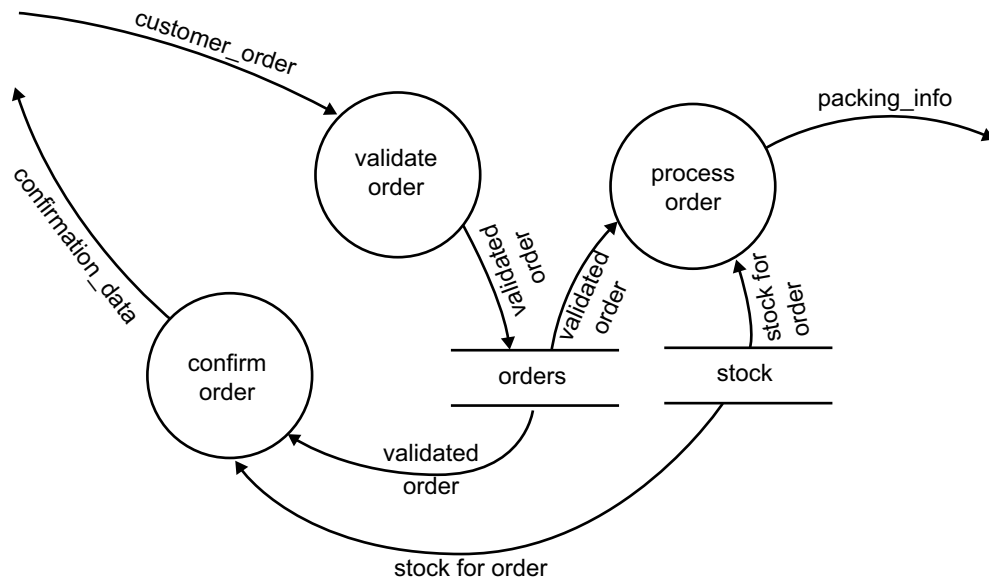
**Question 12**

A ← 6
B ← 6
FOR COUNT 1 TO 3
A ← A – COUNT
B ← B + A
OUTPUT A, B

For the Nassi-Schneidermann diagram above, what are the final values of A and B?

	<b>A</b>	<b>B</b>
<b>A.</b>	6	6
<b>B.</b>	6	12
<b>C.</b>	12	12
<b>D.</b>	0	14

**Question 13**



In the data flow diagram shown above, what do the symbols labelled **stock** and **orders** represent?

	<b>stock</b>	<b>orders</b>
A.	data store	stock orders
B.	data store	data store
C.	what is in stock	what is needed
D.	data flows	data flows

**Question 14**

In a data flow diagram, which one of the following shapes represents a process?

A.



B.



C.



D.



**Question 15**

This algorithm calculates the total cost of a group of products.

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BEGIN
  Total_Cost ← 0
  Code ← 0
  WHILE there are items to be processed
    INPUT Product_Cost [Code]
    Total_Cost ← Total_Cost + Product_Cost [Code]
    Code ← Code + 1
  ENDWHILE
  OUTPUT Total_Cost, Code
END

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In the above algorithm, which one of the following is an array?

- A. Code
- B. Product\_Cost[Code]
- C. Total\_Cost
- D. WHILE

**Question 16**

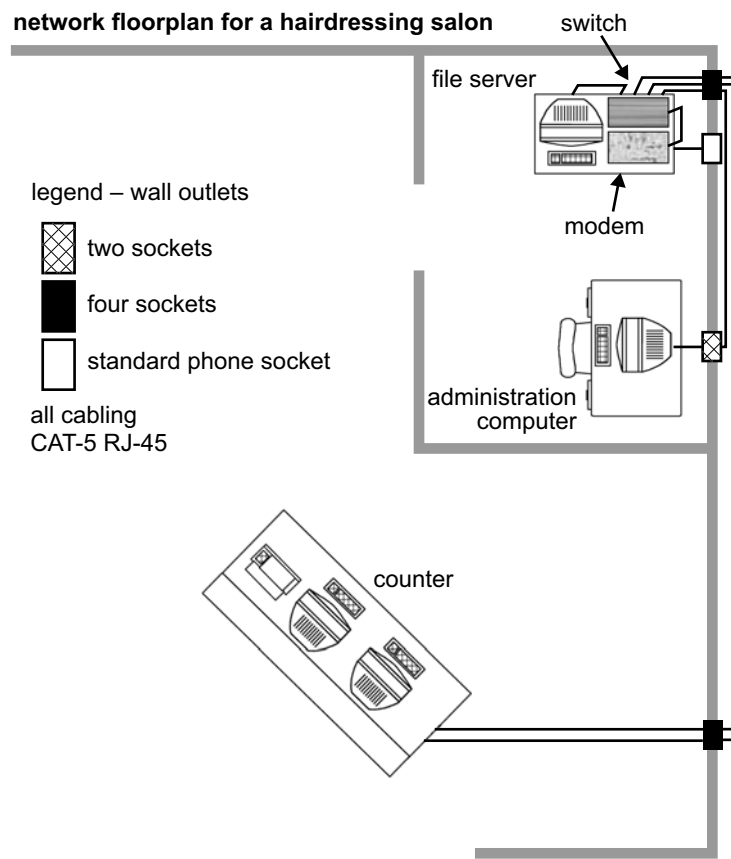
	<p><b>Buy Now</b></p> <p><b>TravelFriend Notebook</b></p> <p>Features include:          Celeron 2.5 Mhz, 256 Mb, 40 Gb,          DVD/CDRW, 56K, W/less LAN,          touchpad, MS XP Home</p>
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In the advertisement shown above, which hardware component does 2.5 Mhz refer to?

- A. CPU
- B. RAM
- C. screen
- D. hard drive

The following information relates to Questions 17 and 18.

Figure 1 shows the layout for a computer network used in a hairdressing salon.



**Question 17**

What is the topology of the network shown in Figure 1?

- A. bus
- B. star
- C. switch
- D. file server

**Question 18**

What type of network is represented in Figure 1?

- A. Business Area Network
- B. Large Area Network
- C. Local Area Network
- D. Wide Area Network

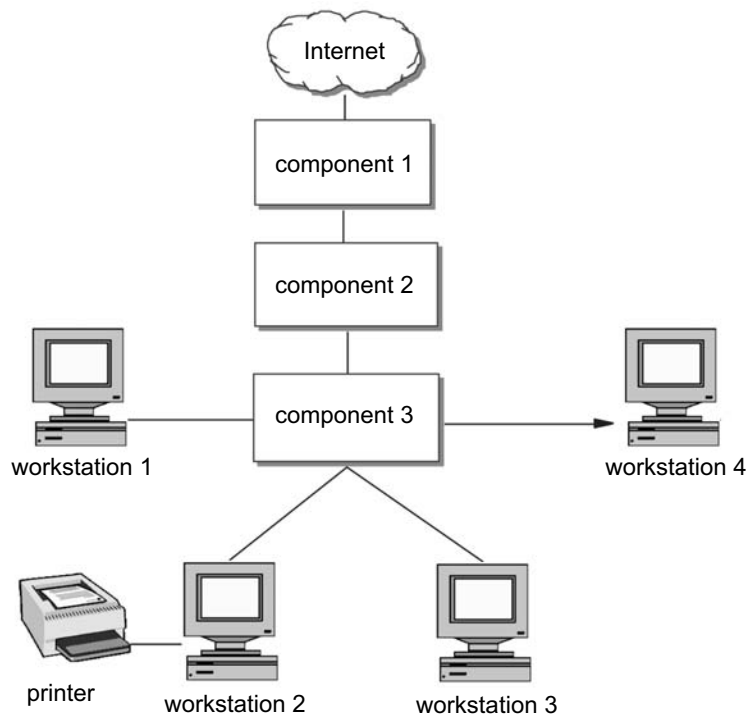


**Question 19**

Tools used to represent the physical design of a system include

- A. data flow diagrams and structure charts.
- B. system flow charts and context diagrams.
- C. data dictionaries and context diagrams.
- D. structure charts and system flow charts.

**Question 20**



What are the three missing components indicated on the diagram above?

	<b>Component 1</b>	<b>Component 2</b>	<b>Component 3</b>
<b>A.</b>	switch	server	firewall
<b>B.</b>	server	firewall	switch
<b>C.</b>	server	switch	firewall
<b>D.</b>	firewall	server	switch

**SECTION B**

The following questions are provided to demonstrate how new aspects of Units 3–4 may be examined. Many questions from Section A of previous VCE Information Systems examinations (2003–2006) remain relevant when preparing for the VCE Software Development examination. Section B will be worth 20 marks in total.

**Question 1**

Jamie used the Internet to access a website to download some screen savers. Shortly afterwards he noticed his computer was running slower than usual and, after some checking, found that the Internet was being accessed although he was not browsing.

Spyware could have been the cause of the problem. Explain how.

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3 marks

**Question 2**

Computer programs can employ many different types of data structure to improve processing efficiency.

Three simple types of data structure are arrays, records and linked lists.

For each of these three data structures, identify different types of data that they deal with and the way the data is organised.

	Type of data	Organisation of data
<b>Arrays</b>		
<b>Records</b>		
<b>Linked lists</b>		

6 marks

**Question 3**

Briefly explain the use of the Rapid Application Development (RAD) method when developing systems.

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2 marks

## SECTION C – Case study

This section will remain similar to past examinations. The sample material provided below relates to new aspects of Units 3–4 of the study design; it is based on the case study from the 2003 VCE Information Systems examination. Other case studies (Section B) of previous VCE Information Systems examinations (2003–2006) remain relevant. Section C will be worth 50–60 marks in total.

### World hockey federation system

#### The existing system

Hockey is a popular world sport and is managed by the World Hockey Federation (WHF). The WHF runs its Hockey World Cup competition every six years. As Australia is one of the leading hockey nations, the WHF have their headquarters in Melbourne.

The WHF hosts its own website. This has not been updated since the last World Cup.

The website is hosted on a server running at 400 MHz with a 2 GB hard drive and 32 MB RAM. It operates through a router and 64 K ISDN line. This was sufficient for the 1998 World Cup website as web pages were small and contained text and photos that only required a total storage space of 10 MB. It was not dynamic or interactive.

The host server is also used as the network file server at the WHF headquarters. The file server is part of the existing client-server network in Melbourne. This network is connected using an eight port non-switching hub with six workstations, one colour printer, one black and white printer and a scanner.

#### Proposed system

For the 2004 Hockey World Cup, the WHF will set up a temporary site in the host country's main stadium. A temporary server will collect data from all World Cup officials at each match and transmit it to the online web server in Melbourne.

For this event, the WHF will need to improve its website since it is expected that this website will receive about one million hits per day. It is planned that the new site will enable fans to search for information on teams, players and matches. This information will be kept in an interactive database. The website will also provide up-to-date statistics and photos. A real-time view of matches in progress will be provided by digital video cameras (web cams) set up at the main pitch.

#### Question 1

At the Hockey World Cup, officials will have wireless-enabled portable devices. These will be used to update results and statistics for the website. Maree, the system analyst, is undecided about whether to provide wireless enabled PDAs or mobile phones for the officials.

Which would you recommend? \_\_\_\_\_

Provide three reasons for your recommendation.

Reason 1 \_\_\_\_\_

Reason 2 \_\_\_\_\_

Reason 3 \_\_\_\_\_

3 marks

**Question 2**

The mobile phones and PDAs will be easier to misplace or steal than a notebook. Maree is concerned that if this happens then unauthorised persons will be able to change results and statistics on the website.

Describe three actions that would help to prevent this from happening.

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6 marks