



CATHOLIC SECONDARY SCHOOLS  
ASSOCIATION OF NEW SOUTH WALES

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Centre Number

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Student Number

**2008**  
**TRIAL HIGHER SCHOOL CERTIFICATE**  
**EXAMINATION**

# Information Processes and Technology

Afternoon Session  
Friday, 8 August 2008

## General Instructions

- Reading time – 5 minutes
- Working time – 3 hours
- Write using blue or black pen
- Draw diagrams using pencil
- Write your Centre Number and Student Number on this page

**Total marks – 100**

### Section I

Pages 2–9

**20 marks**

- Attempt Questions 1–20
- Allow about 40 minutes for this section

### Section II

Pages 10–12

**40 marks**

- Attempt Questions 21–24
- Allow about 1 hour and 10 minutes for this section

### Section III

Pages 13–17

**40 marks**

- Attempt TWO questions from Questions 25–28
- Allow about 1 hour and 10 minutes for this section

## Disclaimer

Every effort has been made to prepare these 'Trial' Higher School Certificate Examinations in accordance with the Board of Studies documents, *Principles for Setting HSC Examinations in a Standards-Referenced Framework* (BOS Bulletin, Vol 8, No 9, Nov/Dec 1999), and *Principles for Developing Marking Guidelines Examinations in a Standards Referenced Framework* (BOS Bulletin, Vol 9, No 3, May 2000). No guarantee or warranty is made or implied that the 'Trial' Examination papers mirror in every respect the actual HSC Examination question paper in any or all courses to be examined. These papers do not constitute 'advice' nor can they be construed as authoritative interpretations of Board of Studies intentions. The CSSA accepts no liability for any reliance use or purpose related to these 'Trial' question papers. Advice on HSC examination issues is only to be obtained from the NSW Board of Studies.

**2601-1**

## Section I

20 marks

Attempt Questions 1-20

Allow about 40 minutes for this section

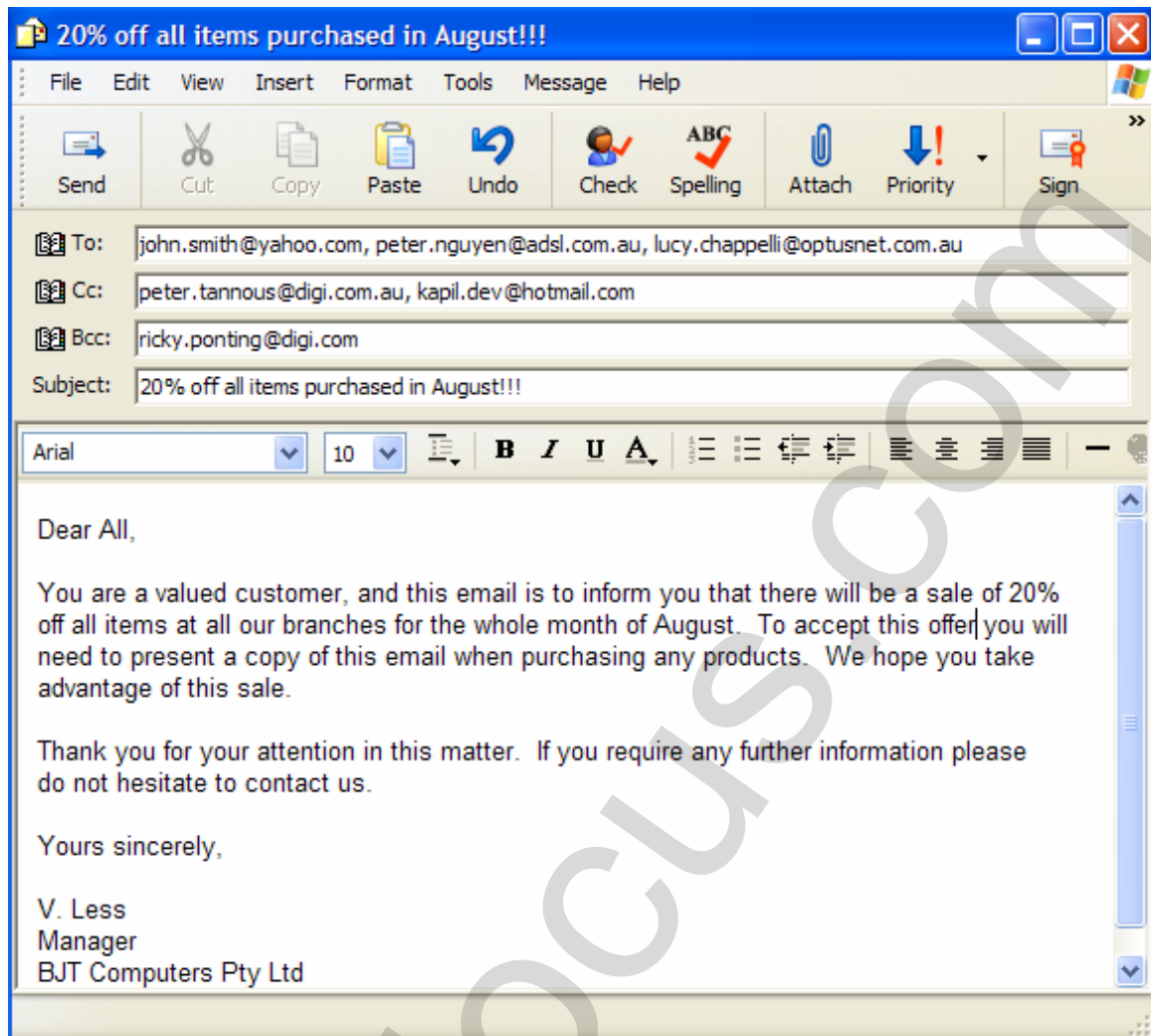
Use the Multiple Choice Answer Sheet provided

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- 1 Which of the following is the most accurate method of error detection when transmitting data?
  - (A) Retransmission error check
  - (B) Cycle redundancy check
  - (C) Parity check
  - (D) Checksum
  
- 2 The process in which characters in the data are systematically changed to render them unreadable by any who do not possess the key is called
  - (A) differential accessing
  - (B) sequential accessing
  - (C) encryption
  - (D) decryption
  
- 3 Which of the following is not a type of storyboard?
  - (A) Linear
  - (B) Non-Linear
  - (C) Hierarchical
  - (D) Non- Hierarchical
  
- 4 The process of routing and transferring data packets is called
  - (A) Packet routing
  - (B) Packet transfer
  - (C) Packet directing
  - (D) Packet switching

- 5 Which information system shown below would be used to make a recommendation?
- (A) Transaction Processing System
  - (B) Decision Support System
  - (C) Management Information System
  - (D) Office Automation System
- 6 Identify which characteristic and bandwidth represents a coaxial cable transmission media type.
- (A) High distortion and 10Mbps
  - (B) High speed transmission and >400Mbps
  - (C) Low distortion and 10Mbps
  - (D) Low speed transmission and >400Mbps

Use the diagram below to answer questions 7 and 8:



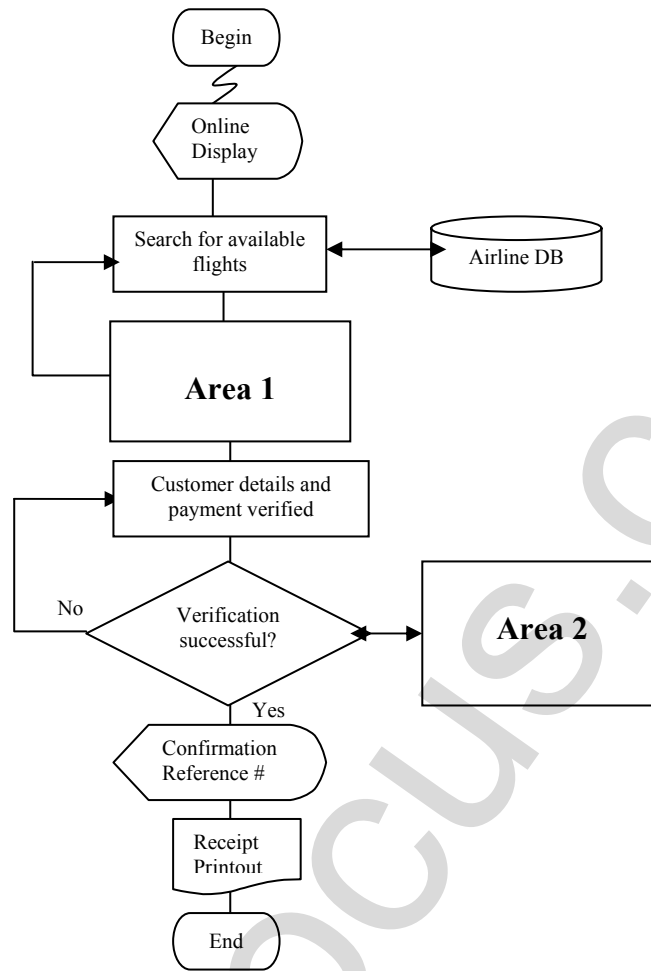
7 How many recipients are being sent this email?









- (A) 3
- (B) 5
- (C) 6
- (D) 7

8 What does the term **Bcc** refer to?

- (A) Blind computer communication
- (B) Basic computer communication
- (C) Basic carbon copy
- (D) Blind carbon copy

- 9 The system flowchart below outlines an online e-ticketing flight service system. Which symbols would be included in areas 1 and 2 respectively?



- (A)  
- (B)  
- (C)  
- (D)  

Use the database below to answer question 10.

An office keeps track of consumables in this database. Use the database below to answer question 10 and 11.

**Supplies**

Item_ID	Name	Qty	Price
101A	Paper	5	\$5.50
102B	Pens	12	\$1.50
103C	Folders	15	\$2.75
104D	Toner	5	\$260.00

After running a query, the following results were displayed.

Name
Folders
Paper
Pens

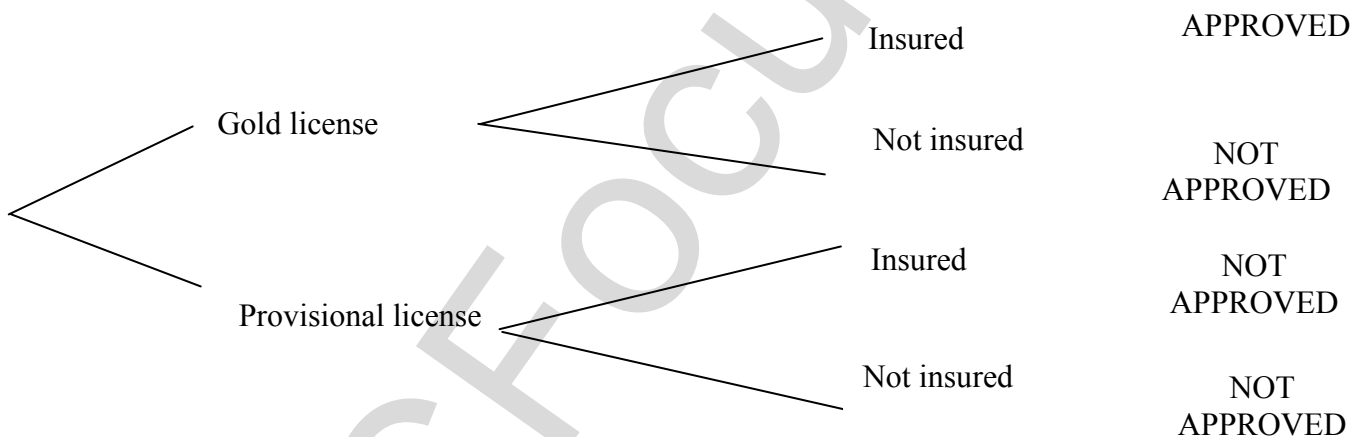
- 10 Which SQL statement below would generate the results shown above?
- (A) SELECT Name FROM Supplies WHERE Price < 6 ORDERBY Name asc
  - (B) SELECT Name FROM Supplies WHERE Price > 1 ORDERBY Price asc
  - (C) SELECT Name, Price FROM Supplies WHERE Price < 6 ORDERBY Name asc
  - (D) SELECT Name, Price FROM Supplies WHERE Price > 1 ORDERBY Name desc
- 11 Which field is most likely to be the primary key?
- (A) Item\_ID
  - (B) Item
  - (C) Qty
  - (D) Price
- 12 Which of the following is the main reason for normalising a database?
- (A) To increase readability
  - (B) To make thorough queries
  - (C) To eliminate redundant fields
  - (D) To link tables and create relationships

- 13** Which of the following most accurately explains a network operating system?
- (A) A network operating system is a software barrier around a network.
  - (B) A network operating system manages the network, its resources and users.
  - (C) A network operating system is a computer that stores and distributes web pages.
  - (D) A network operating system is a facility that gives users access to all data on the network.

- 14** Which of the following is NOT a reason for creating a prototype?

- (A) To identify the project resource needs
- (B) To show how an existing system works
- (C) To help identify the problems in a system
- (D) To demonstrate a proposed new system

Use the following diagram to answer questions 15 and 16.



- 15** This chart is known as a

- (A) system tree
- (B) decision tree
- (C) branching chart
- (D) hierarchy chart

16 Which of the following decision tables accurately reproduces the logic of the chart?

(A)

CONDITIONS	RULES			
Gold license	Y	N	Y	N
Insured	Y	Y	N	N
RESULT				
Approved	N	N	N	Y
Not approved	Y	Y	Y	N

(B)

CONDITIONS	RULES			
Gold license	Y	N	Y	N
Insured	Y	Y	N	N
RESULT				
Approved	Y	N	N	N
Not approved	N	Y	Y	Y

(C)

CONDITIONS	RULES			
Gold license	Y	N	Y	N
Insured	Y	Y	N	N
RESULT				
Approved	N	Y	Y	Y
Not approved	Y	N	N	N

(D)

CONDITIONS	RULES			
Gold license	Y	N	Y	N
Insured	Y	Y	N	N
RESULT				
Approved	Y	Y	Y	N
Not approved	N	N	N	Y



**17** Which of the following would you use to establish an Internet connection?

- (A) file server
- (B) print server
- (C) internet provider
- (D) communications server

Use this scenario to answer questions 18 and 19.

The Smart Bank would like to expand its Internet banking facilities by allowing its non-business customers to transfer funds and pay bills over the Internet. Data has been gathered on the existing system, the requirements of the new system determined and charts and diagrams have been created.

**18** The next stage of system development is

- (A) Understanding the problem
- (B) Making decisions
- (C) Designing solutions
- (D) Implementation

**19** The bank would like to implement the new Internet banking system on a small scale without too many changes initially to the existing system. Which method of conversion should the bank undertake?

- (A) direct conversion
- (B) pilot conversion
- (C) parallel conversion
- (D) phased conversion

**20** A database has been created to store personal details of customers, including addresses. One of the fields contains all postcodes and that field can only accept postcodes in NSW. A typist has entered 216T instead of 2164. Which checking method shown below would locate this error?

- (A) list check
- (B) type check
- (C) range check
- (D) check digit

## Section II

40 marks

Attempt Questions 21 – 24

Answer each section in a SEPARATE writing booklet.

If you include diagrams in your answer make sure they are clearly labelled.

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Marks

**Question 21** (10 marks) Use a SEPARATE writing booklet.

The use of e-TAGs on motorways is an example of an information system. Read the following information about “e-TAGs”.

All toll roads in Australia now offer the convenience of paying for your tolls electronically, without stopping at a cash booth. Some, like Lane Cove Tunnel, Falcon Street Gateway and Westlink M7, are fully electronic toll roads without any cash booths, so with an e-TAG installed you do not have to stop during your journey.

With your e-TAG in your vehicle you can pay for your tolls automatically on any toll road in Australia. The e-TAG (about the size of a credit card) is an electronic tag that you attach to the inside front windscreen of your vehicle. The tag transmits a signal to the computer at the toll sensors as you approach, and within a fraction of a second the toll is charged to your account.

Source: ExpressTag.com.au (2008)

Answer the following questions, based on the information above.

- (a) Relating to the e-TAG information system, describe the: 4
- (i) purpose of the system
  - (ii) data/information
  - (iii) participants
  - (iv) information technology (IT)
- (b) Describe the collecting, storing and retrieving, and transmitting and receiving of data when an e-tag is activated at a toll point on a motorway. 3
- (c) Discuss TWO potential issues relating to this information system that could impact on the participants involved. 3

**Question 22** (10 marks) Use a separate writing booklet

Alpha IT Pty Ltd has been employed by the ABC Bank to develop feasibility studies so as to implement a new Windows® based Bank database. The new database will enable bank staff to have a more user friendly database that will enable bank staff in 40 branches throughout NSW to manage, update, and view all customer accounts of the bank. This project should be completed within 6 months.

- (a) Identify FOUR criteria that are considered during a feasibility study. **2**
- (b) Create a Gantt chart that outlines the plan and timeframe of this project. **3**
- (c) Recommend and justify which conversion method would be most appropriate to implement this project. **2**
- (d) Based on the new database system. Create a dataflow diagram (DFD) that shows how a bank teller can process a customer withdrawal transaction at the bank. **3**

**Question 23** (10 marks) Use a separate writing booklet

DVDonDemand.com.au is a web based retailer that allows customers to purchase DVD's over the Internet. The company has decided to create a file that can store a large quantity of data pertaining to the DVD's such as title, a synopsis and a trailer, as well as the customers personal and payment details. The customers will be able to access specific functions of this information system through a web-based hypermedia interface.

- (a) Identify the Information Technology required to create and run this Information System. **3**
- (b) Contrast between a database and DBMS (Database Management System). **2**
- (c) Create an ERD (Entity Relationship Diagram) for DVDonDemand.com.au **5**

**Question 24** (10 marks) Use a separate writing booklet

*The Minds Eye* is a graphic design studio that is setting up a new office in Sydney. They have offices in London, New York, Los Angeles and Tokyo. In the organisation they have a range of designers utilising multiple applications. They design everything from still images to video editing to advertisements to web-based animations.

In their new Sydney office, 30 computers will be networked, sharing resources with each other and connecting to other offices around the globe through the Internet.

*The Minds Eye* has employed an IT consultant to design their new system and an administrator to ensure that all computers maintain their operational capabilities.

- (a) When setting up the network, the IT consultant must decide on what device would be most appropriate to connect the computers. Compare and contrast the use of a hub or a switch. **3**
- (b) Large storage requirements and the sharing of files mean that a number of servers will need to be utilised. Describe the servers required for this system and their purpose. **3**
- (c) With such a large multinational organisation, many issues arise. Describe social and ethical issues that the staff at *The Minds Eye* would need to take into consideration. **4**

### Section III

40 marks

Attempt TWO questions from Questions 25 – 28

Allow about 1 hour and 10 minutes for this section

Answer each section in a SEPARATE writing booklet.

If you include diagrams in your answer make sure they are clearly labelled.

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Marks

#### Question 25 – Transaction Processing Systems (20 marks)

Sunshine City Press, Aug 1<sup>st</sup> 2008

##### Electronic Ticketing Introduced in the Sunshine City

Today has seen the introduction of the new Sunshine City Transit Card, an electronic travel card that allows the user to travel on all city transportation systems without the need for cash.

The card will be accepted from today on every train and bus throughout the city. Commuters are able to set up an account by visiting their local Sunshine City Transit Office or via the internet or phone.

Participating commuters will receive an electronic card which they are able to swipe on entry and exit of their transport option.

Advantages of using the Sunshine City Transit Card include automatic debiting of the users bank account to “top up” the balance of the card, the commuter being charged for the exact distance of the trip travelled to the kilometre, which is assisted by GPS technology, and the convenience of using one card for all transport options.

Government officials are positive about the introduction of the system and hope that by introducing it in conjunction with current cash based systems, commuters will slowly become confident in using the technology.

- (a) Many systems use more than one type of transaction processing.
- (i) Using a clear example of each, describe both real time processing and batch processing within the Sunshine City Transportation Information System. **4**
  - (ii) Discuss ONE disadvantage of batch processing. **2**
- (b) Identify the information technology required for the collection of data in the Sunshine City Transportation Information System. **3**

Question 25 continues on page 14

Question 25 (continued)

- (c) Evaluate how data from the Sunshine City Transportation System could be used in a Management Information System or Decision Support System to streamline city transport. **3**
  
- (d) Suggest a backup system for the Sunshine City Transportation Information System. Justify your choices. **4**
  
- (e) Describe the implications for system participants with the introduction of the Sunshine City Transit Card. **4**

**End of Question 25**

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**Question 26 – Decision Support Systems (20 marks)**

- (a) Define each of the following terms: 2
- (i) Expert system
  - (ii) fuzzy logic
- (b) What is the difference between an intelligent and a non – intelligent robot? 2
- (c) An organization that holds a lot of confidential information needs to devise a security system to allow access to Scientists and researchers to enter a restricted area. Artificial vision or voice recognition has been suggested.
- (i) How have these technologies improved over time? Discuss the advantages of using technologies for security purposes. 4
  - (ii) Outline ONE reason why artificial vision may not work. 1
  - (iii) Outline ONE reason why voice recognition may not work. 1
  - (iv) Describe another security method that they could use. 2
- (d) Linda wants to go on a holiday and wants to use an expert system to help her decide where to go. She will only go on a holiday if her boss approves it, the plane ride can not exceed two hours, the weather is tropical and holiday destination has a 5 star hotel. Create a knowledge base using a set of IF..THEN rules for the expert system. 5
- (e) When using a Group Decision Support System (GDSS) in a business situation. The success of the business may rely on the results given. Analyse the ways in which a GDSS assists meetings, planning and decision making, to improve the overall functioning of a business. 3

**Question 27 – Automated Manufacturing Systems (20 marks)**

- (a) (i) Describe a computing numerical control (CNC) lathe system, give an example of how it could be used in an AMS. **3**
- (ii) Describe an automated manufacturing *discrete system*, and provide an example. **3**
- (b) (i) Identify and describe an actuator and sensor that could be used in a microprocessor controlled device to perform a task such as automatic painting, spot welding or computer embroidery. **4**
- (ii) Identify the type of data collected by a sensor. Identify the device that converts the data into a form that can be used in the system and explain how this device converts the signal. **4**
- (c) Nick's Warehouse is an automated warehouse that uses robotic devices, barcodes/bar code readers and human workers. The warehouse receives, stores, moves and dispatches products. A regular stock take of goods must be completed. **6**

Explain the reasons for automation of Nick's Warehouse. In your answer consider;

- Inventory Tracking
- Safety
- Cost
- Productivity



**Question 28 – Multi-media Systems (20 marks)**

(a) Define the following terms when used in relation to multimedia systems. **2**

- (i) hypertext
- (ii) interactivity

(b) One of the main media types used within multimedia is animation. **4**

With relation to this media, distinguish between the processes of:

- (i) cell-based animation and path-based animation
- (ii) tweening and morphing

(c) At Visual Arts High School, a class is learning to develop short animations and movies. **3**

Calculate the *file size*, in kilobytes (Kb), of a 90 minute movie, if:

- there are 24 fps,
- each frame is 2048 pixels by 872 pixels, and
- there are 32 bits per pixel.

Show ALL working out.

(d) One major area of multimedia use is *leisure and entertainment* which includes computer games.

(i) Outline the reasons why copyright is a relevant and important issue for programmers and designers when creating new interactive games for users. **2**

(ii) In the introductory menus for interactive games, hypertext is used extensively as a form of navigation. **6**

Describe THREE additional types of media that could be used within an interactive game.

(iii) Briefly discuss developments in hardware that have enabled users to engage with interactive games and to experience the realness of the interface. **3**

**End of paper**

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**EXAMINERS**

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