



CATHOLIC SECONDARY SCHOOLS
ASSOCIATION OF NEW SOUTH WALES

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Centre Number

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Student Number

2009
TRIAL HIGHER SCHOOL CERTIFICATE
EXAMINATION

Information Processes and Technology

Afternoon Session
Friday, 14 August 2009

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 3–7

20 marks

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

Section II

Pages 8–11

40 marks

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

Section III

Pages 12–15

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.

3200-1

EXAMINERS

Zoe Petrovich (Convenor)
Heather Jesuadian
Vanessa Less
Brian Johnston
Dr Maree Skillen
David McMinn

All Saints Catholic Senior College, Casula
Aquinas College, Menai
La Salle Catholic College, Bankstown
Queenwood School for Girls, Mosman
Arden Anglican College, Epping
St Pauls Catholic College, Greystanes

Section I

20 marks

Attempt Questions 1 – 20

Allow about 40 minutes for this section

Use the multiple-choice answer sheet for Questions 1–20.

- 1 Data flow diagrams are a graphical method of representing:
 - (A) both the flow of data and the logic of a system
 - (B) all possible combinations of inputs and outputs
 - (C) a system that uses only a single process together with inputs and outputs
 - (D) a system that uses a number of processes together with inputs, outputs and storage
- 2 A URL is the address of a file or resource on the Web. Which of the following is an example of a correctly formatted URL?
 - (A) `http://www.ac.edu.au/index.html`
 - (B) `http://www.ac.edu.au/html.index`
 - (C) `http: //www.edu.ac.au/index.html`
 - (D) `http: //ww.au.edu.ac /index.htm`
- 3 Which of the following best describes the role of a technician?
 - (A) Solve hardware and software problems
 - (B) Create a set of test data for the system
 - (C) Prepare input data for the system
 - (D) Resolve conflicts among staff
- 4 In a relational database, a schema is used to define which of the following?
 - (A) fields, records and entities
 - (B) fields, attributes and entities
 - (C) attributes, relationships and entities
 - (D) attributes, relationships and records

- 5 Tom is creating a presentation. During his presentation he needs to show examples of various web pages. The best way to do this is to:
- (A) create hypertext
 - (B) create hyperlinks
 - (C) copy and paste
 - (D) copy and use paste special
- 6 Microwave transmission stations require repeaters to be placed on tall buildings and mountains because microwave signals need to be boosted and amplified over long distances. They also need to be:
- (A) placed between one and two kilometres apart
 - (B) attached to phone lines because microwaves travel in analogue form
 - (C) placed within the line of sight of each other because microwaves travel in straight lines
 - (D) able to travel through space because microwaves are low frequency radio waves
- 7 Why does a computer require a Network interface card?
- (A) To allow the user to access their work station
 - (B) To allow the linking of two similar networks
 - (C) To allow the user to customise their interface
 - (D) To allow the device to be connected to the network
- 8 Fred is a programmer, who needs to see the project leader to discuss staff training days for the new application he had written. Which of the following replies would suggest that the project leader is an active listener?
- (A) "Go and interview the staff and see how they feel about using the new application"
 - (B) "When will your programme be ready for testing and debugging purposes?"
 - (C) "You are interested in adding times and dates to our schedule for staff training"
 - (D) "Staff training will occur after we have completed all stages of the system development cycle"

- 9 Acquiring services and personnel from another business rather than using your own is called
- (A) Hiring
 - (B) Supplying
 - (C) Purchasing
 - (D) Outsourcing
- 10 A Network card is usually placed into which slot on the computer?
- (A) USB
 - (B) Expansion
 - (C) Card reader
 - (D) NIC port
- 11 A new computer system is to be fully trialled in one store to completely test it and to fully train staff before it is released to 150 other stores.
- This type of implementation is known as:
- (A) Pilot
 - (B) Direct
 - (C) Phased
 - (D) Parallel
- 12 A database records details of each model and make of cars made in Australia since 1948. Which of the following QBE search criteria would find all models of Commodores made after 1990?
- (A) Year>1990 AND Make = "Commodore"
 - (B) Year>1990 OR Make = "Commodore"
 - (C) Year>=1990 AND Make = "Commodore"
 - (D) Year>=1990 OR Make = "Commodore"

13 **http**: is a common communications protocol. What level protocol is **http**:?

- (A) Addressing
- (B) Application
- (C) Transmission
- (D) Communications control

14 In a relational database a row can be referred to as a :

- (A) tuple
- (B) entity
- (C) record
- (D) attribute

15 SMTP is a communications setting for Email. What does it stand for ?

- (A) Single Mail Transfer Protocol
- (B) Single Mail Transfer Parameter
- (C) Simple Mail Transfer Protocol
- (D) Simple Mail Transfer Parameter

16 Why would a systems analyst build a requirements prototype?

- (A) to show a working model of the entire information system
- (B) in order to understand the needs of the system
- (C) for participants and open for suggestions
- (D) to show the layout of the new system

- 17** The architecture of a client server network may consist of thin clients. Which of the following statements best describes a thin client?
- (A) It depends on the server for processing activities, it is mainly used for conveying input between the node and remote server
 - (B) It depends on the server for processing activities, it is mainly used for conveying input and output between the user and remote server
 - (C) It performs as much processing as possible and passes data for storage and communications needs to the server.
 - (D) It performs as much processing as possible and passes data for input, output, storage and communications needs to the server
- 18** Telecommuting is a system that relies on communication technology. What is it used for?
- (A) Communicating and discussing business ventures over the internet
 - (B) Attending conferences and business meetings over the internet
 - (C) Buying and selling of goods and services over the internet
 - (D) Allowing people to work from home
- 19** At which stage of the system development cycle is the feasibility study conducted?
- (A) Understanding the problem
 - (B) Planning
 - (C) Designing
 - (D) Implementation
- 20** Wendy was creating a database, she types in a clients details and types Dar5en instead of Darren. What type of data validation check would pick up this error?
- (A) Range check
 - (B) List check
 - (C) Type check
 - (D) Check digit

Section II

40 marks

Attempt Questions 21 – 24

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.

Marks

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

The Doona chain is an organisation that has 30 Bed and Breakfast's around NSW. Each Bed and Breakfast has a similar set up and appearance, and they all run the same type of booking system, utilising the traditional pen and paper "reservation book". The owners of the Doona chain are investigating upgrading their current reservation system to a computerised method.

- (a) Identify and outline the FOUR areas of feasibility that would need to be considered before embarking on this upgrade. **2**
- (b) Feeling they do not have the skills to complete the upgrade themselves, the owners of the Doona chain hire a systems analyst. Describe TWO communication skills required by the systems analyst? **4**
- (c) After designing a basic computerised reservation system, the systems analyst must decide on the most appropriate conversion method. Outline the FOUR conversion methods from which he may choose. Select an appropriate conversation method and justify your selection. **4**

Question 22 (10 marks) Use a separate writing booklet

Toni's Rentals currently utilises a flat-file database for keeping track of their cars. Current information stored includes the cars' number plate, the model of the car, the car's age, the number of kilometres the car has travelled in this trip, the customer's details including the name of who hired the car and the date it was hired.

- (a) The staff at Toni's Rentals have been experiencing some difficulties with the accuracy of their data. Outline why this might have occurred. **2**
- (b) One method that may allow Toni's Rentals to overcome these problems involves creating a relational database. Create a schema for a relational database for Toni's Rentals. **5**
- (c) To ensure there is no data redundancy, it is important to normalise the database. With reference to the relational database you created on part (b), describe TWO actions that you have undertaken in the schema to ensure data redundancy was reduced. **3**

Question 23 (10 marks) Use a separate writing booklet

The diagram below shows the entities and attributes of an electronic library database. Use this diagram to answer the questions below.

Entity	Attribute
Borrowers	Borrower ID
	FirstName
	Surname
	Address
	Suburb
	PostCode
	PhoneNumber
Resources	Overdue
	CallNumber
	Title
	Author
	MediaType
	Section

- (a) Create a data dictionary, adding TWO more attributes for the Resources Entity. 3
- (b) Design a form view of the library database that would show ONE record from the Borrowers Entity. 2
- (c) Describe TWO types of security methods that could be used to protect this database against any potential security threats. 2
- (d) Stocktaking of the library is occurring with the Fiction section first being actioned. Write an SQL query that could search the database for borrowers (in alphabetical order) who have any overdue resources in the Fiction Section. 3

Question 24 (10 marks) Use a separate writing booklet

- (a) Internet trading and e-commerce have significantly increased rapidly in recent times, especially in the retail industry. Businesses of virtually all types are capitalising from trading online.
- (i) Identify and describe THREE advantages for businesses that use e-commerce or internet trading. 3
 - (ii) Discuss TWO issues relating to the use of e-commerce that may impact on society. 2
- (b) An Australian Credit Union (BJT Credit Union Inc.) spans across the country throughout 15 branches. BJT Credit Union has a network consisting of numerous users accessing thousands of nodes, such as basic terminals and PCs, servers, printers, etc.
- (i) Networks deal with multiple users wanting to use a network at the same time via numerous methods. Outline ONE network access method (protocol) that can be used when multiple users within the BJT Credit Union access the company's network simultaneously. 2
 - (ii) A new branch will be opening up soon in Darwin. This branch should have the capacity for 20 computers to share resources within the local branch and connect to the other branches throughout Australia. Recommend and justify which network topology would be most suitable for the new branch. The network topology must be quick and easy to set-up and still operational if a node is down. 3

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.

	Marks
Question 25 – Transaction Processing Systems (20 marks)	
(a) Explain each of the terms below referring to Transaction processing systems	
(i) Data validation	2
(ii) Transaction file	2
(b) You have been appointed as the Head Librarian at Education High School, a co-educational high school with students from Years 7-12. You are developing a proposal to present to the Principal of the school to allow a technology upgrade in the library to include the use of RFID technology on all resources. This will assist you and your staff with loans and returns, reserves, shelf management, stocktakes and other daily tasks. As part of your proposal;	
(i) Describe RFID technology, and include TWO characteristics of the technology.	3
(ii) Discuss the use of RFID technology in the library.	3
(c) Analyse the social and ethical issues:	
(i) that may impact the staff of the library.	3
(ii) that may arise from the actions of participants.	3
(d) Evaluate the use of OLAP (Online Analytical Processing) in a business environment.	4

Question 26 – Decision Support Systems (20 marks)

- (a) Define each of the following terms: **3**
- (i) Heuristics
 - (ii) Data warehouse
 - (iii) Inference engine
- (b) Identify and describe the THREE categories of decision making. **3**
- (c) Explain how a problem can be solved using an intelligent robot. **2**
- (d) When using the process of data mining, erroneous inferences can occur. What are erroneous inferences? **2**
- (e) A medical decision support program is being created to assist a Vet in diagnosis and treatments of injured animals. It must be able to give details on recommended treatments.
- (i) Compare the use of an expert system and a neural network in relation to the scenario. **3**
 - (ii) Clearly identify which of the TWO systems would be suitable for a diagnosis and treatment system. Justify your selection. **3**
 - (iii) Describe issues that would need to be addressed when treating animals with this system. **4**

Question 27 – Automated Manufacturing Systems (20 marks)

- (a) (i) Define the term *noise* and explain ONE method of reducing noise in an automated manufacturing systems. **3**
- (ii) Identify a type of actuator and describe how it could be used in an automated manufacturing system. **3**
- (b) Nick's Water Company, filters water. The water is then automatically filled into bottles. The bottles then move along a conveyor belt to a location where they are packed into crates for distribution, by a robotic arm. The crates are then loaded onto a pallet. An RFID tag is placed onto each pallet.
- Aaron has a job of checking visually the filled water bottles and driving a forklift to move the pallets to the warehouse for storage and performing routine maintenance on the robotic arm.
- (i) Describe the operation of Radio-frequency identification (RFID) tags and how they can assist in inventory tracking at Nick's Water company. **4**
- (ii) Draw a Block Diagram of the automated bottle filling and packing system at Nick's Water Company. On your diagram clearly indicate machine-centred or human-centred tasks, including; **4**
- filling bottles
 - checking bottles
 - packing filled bottles
- (c) Describe the positive and negative impacts of working in a semi automated industry at Nick's Water Company **6**

In your answer consider;

- Safety
- the reliability and quality of performing repetitive tasks
- the advantages of semi-automation by utilising skills of people

Question 28 – Multi-media Systems (20 marks)

- (a) Discuss THREE differences between printed and digital multimedia versions of information with similar content. **3**
- (b) Particular demands are placed on hardware by multimedia systems. These include: secondary and primary storage requirements, processing and display devices. Define the following terms when used in relation to multimedia systems.
- (i) bit depth **1**
 - (ii) sampling rates for audio data **1**
 - (iii) frame rate **1**
 - (iv) resolution **1**
- (c) Multimedia systems are often used for *education and training*.
- (i) Describe the information technologies that could be used to develop a support product to be used with Year 10 students completing an online course for the NSW Board of Studies, “All My Own Work (AMOW)” program. **3**
 - (ii) Suggest TWO suitable criteria that would assist in evaluating the support product. **2**
- (d) Students going on a Geography field trip are required to keep a ‘blog’ which will detail their experiences. A ‘blog’ is a form of online journal that is published to the Internet and can be read by a broad audience.
- (i) This form of communication involves different characteristics of multimedia systems including *text* and *hyperlinks*. **2**

Discuss how each of these characteristics are used by students when making entries to their ‘blog’ and the importance of each when involving the reader.
 - (ii) Identify and describe TWO factors that must be considered when uploading graphical images and video to the ‘blog’. Include an example for each factor. **4**
 - (iii) In relation to copyright, discuss the importance of evaluating and acknowledging all source data that is included within the ‘blog’ entries. **2**

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