



KADINA HIGH SCHOOL

**HIGHER SCHOOL CERTIFICATE
HALF-YEARLY EXAMINATION**

2001

INFORMATION PROCESSES AND TECHNOLOGY

*Time allowed—One and one half hours
(Includes reading time)*

General Instructions

- Write your NAME in space provided at the bottom of this page.
- Write using blue or black pen.

SECTION I. (20 marks)

- Attempt Questions 1 - 20.
- Allow about 30 minutes for this section.

SECTION II. (40 marks)

- Attempt Questions 21 - 24.
- Allow about 1 hour for this section.

Name:

2001

INFORMATION PROCESSES AND TECHNOLOGY
HIGHER SCHOOL CERTIFICATE
HALF-YEARLY EXAMINATION

Section I. Multiple Choice Answer Sheet.

Select the alternative A, B, C or D that best answers the question.

Fill in the response box completely.

Question	a	b	c	d
1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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9	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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11	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SECTION I

(20 marks)

Attempt Questions 1 – 20.

Allow about 30 minutes for this section.

Use the multiple-choice answer sheet.

1. The uniform resource locator used to find the home page for Kadina High School's homepage is: <http://www.kadina-h.schools.nsw.edu.au/welcome.htm>. The segment www.kadina-h.schools.nsw.edu.au is the
 - (a) Domain name of the server containing the resource.
 - (b) Hypertext transfer protocol.
 - (c) Name of the resource file.
 - (d) URL.
2. What is the best way for a high school to organise data about students and the courses in which they are enrolled?
 - (a) As hypermedia.
 - (b) In a flat-file database.
 - (c) In a relational database.
 - (d) On a course website.
3. The main reason data is compressed before transmission is:
 - (a) To allow transmission over phone lines.
 - (b) To increase the speed of transmission of the file.
 - (c) To maintain security during transmission.
 - (d) To reduce costs of transmission.
4. A school's library circulation desk computer has a password to protect confidential student details from unauthorised retrieval. A second password, used only by the librarian, allows access to information about Internet sites visited by students and teachers. What does this set-up involve?
 - (a) Data security, ethics and privacy.
 - (b) Ethics, computer crime and copyright.
 - (c) The changing nature of work, power and control, and ethics.
 - (d) The changing nature of work, power and control, and privacy.

5. The formatted output from a database query or table containing selected and/or sorted fields is called a:
- (a) Data dictionary.
 - (b) Form.
 - (c) Report.
 - (d) Screen.
6. A computer is used to control access to the laser printer from a network of user computers. What is this computer called?
- (a) Client Server.
 - (b) File Server.
 - (c) Printer Server.
 - (d) Printer Sharer.
7. The mode of communication which allows both participants to transmit and receive at the same time is known as:
- (a) Half-duplex.
 - (b) Half-simplex.
 - (c) Full-duplex.
 - (d) Full-simplex.
8. Internet Service Providers gather client's credit card details across the Internet and store these details. They protect these details by creating a file server that:
- (a) Allows both uploading and downloading across the Internet.
 - (b) Does not allow Internet access.
 - (c) Only allows downloading across the Internet.
 - (d) Only allows uploading across the Internet.
9. Which set of variables must be compatible before two connected computers can transmit to each other?
- (a) Baud rate, parity and number of data bits.
 - (b) Communication software package, computer platforms and baud rate.
 - (c) Parity, baud rate and communication software package.
 - (d) Parity, number of data bits and computer platforms.

10. The layout of a local area network is known as it's:
- (a) Node.
 - (b) Topology.
 - (c) Picture.
 - (d) Star.
11. A company purchases a word processing package for its employees to use at work. One employee borrows the word processing package and installs this software on their home computer. The issue that relates to this activity is:
- (a) Copyright.
 - (b) Equity.
 - (c) Ethics.
 - (d) Privacy.
12. The main advantage of a computer-based database compared to a paper filing system for retrieving information is that the:
- (a) Data can be searched more efficiently.
 - (b) Data is very accurate.
 - (c) Storage medium is a hard disk.
 - (d) Data is organised into data structures.
13. The baud rate is the:
- (a) Number of bits that can be transmitted in one second.
 - (b) Transmission of data at the same rate.
 - (c) Maximum number of data symbols or electrical signals that can be transmitted in one second
 - (d) Number of bauds that can be transmitted in one second.
14. Electronic mail is:
- (a) Only used on the information superhighway.
 - (b) Sending, receiving and storage of messages via facsimile.
 - (c) Sending, receiving and storage of messages via telecommunication.
 - (d) The postal service using machines to electronically sort mail.

15. A unit of data in a database, such as 'Surname', is called a:
- (a) Character
 - (b) Field
 - (c) File
 - (d) Record
16. Which of the following terms describes the action of reorganising database records into alphabetical order on a given field:
- (a) Matching
 - (b) Searching
 - (c) Selecting
 - (d) Sorting
17. A school database contains data about students, including what year they are in, and their selected subjects. The query to find all students in Year 12 who selected both Physics and Chemistry would be:
- (a) Year = 12 AND Subject = "Physics" AND Subject = "Chemistry"
 - (b) Year = 12 AND Subject = "Physics" OR Subject = "Chemistry"
 - (c) Year = 12 OR Subject = "Physics" AND Subject = "Chemistry"
 - (d) Year = 12 OR Subject = "Physics" OR Subject = "Chemistry"
18. A field that uniquely identifies a record is called a:
- (a) Character field
 - (b) Key field
 - (c) Number field
 - (d) Record field
19. The basic requirements for any communication to occur between two parties are:
- (a) A message, a medium, a method of receiving the message, a sender, a receiver.
 - (b) A message, a method of transmitting and receiving the message, a medium, a sender, a receiver.
 - (c) A message, a method of transmitting the message, a receiver.
 - (d) A message, a method of receiving the message, a sender.

20. What name is given to the device used to allow the transfer of data between two LANs operating under the same protocol?

- (a) Bridge
- (b) Converter
- (c) Gateway
- (d) Server

SECTION II

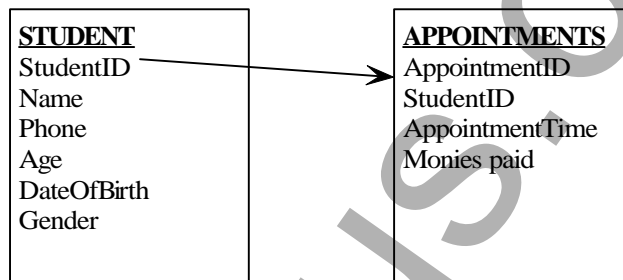
(40 Marks)

Attempt Questions 21 - 24.

Allow about 1 hour for this section.

21. (10 marks) Jenny is a piano teacher who conducts lessons for a number of different students of varying ages and with varying skills. She wishes to use a database information system to keep track of her students and appointments for each lesson. She also needs to track receipt of monies paid for lessons, as some students pay each lesson, and others pay in biweekly or monthly instalments.

Initially the database relationship structure is constructed with the following tables:



- (a) (1 mark) Name a field which is not required. Explain why this field is unnecessary.

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- (b) (1 mark) Name a field which could be separated into two fields. Describe any advantages for this separation.

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- (c) (4 marks) Jenny requires a report detailing total monies paid in the past financial year for taxation purposes. Describe a query and report design that would provide this information.

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- (d) (4 marks) Redesign the database tables and relationships to improve the information system so that:

- (i) the field problems raised in (a) and (b) above are resolved;
- (ii) a separate transactions table can be used to track the monies paid by each student.

22. (10 marks) The Roads and Traffic Authority (RTA) is an organization that uses a database information system. Its purposes are to ensure vehicles are safe and to provide individuals with a driver's licence. The RTA performs a set of information processes that requires participants, data/information and information technology.

When the owner of a vehicle needs to renew the registration, he or she requires a pink slip¹ and a green slip². These forms are presented to the RTA staff along with the old Certificate of Registration. Computer terminals are used to update the data, and a central database is automatically updated with the details of the vehicle, such as plate number, model and engine number. The owner pays the registration. Updated details are then printed on a new Certificate of Registration, which is issued to the owner.

(a) (2 marks) The RTA database information system uses many of the seven information processes. Describe two from the following categories:

(i) Collecting:

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(ii) Transmitting and receiving:

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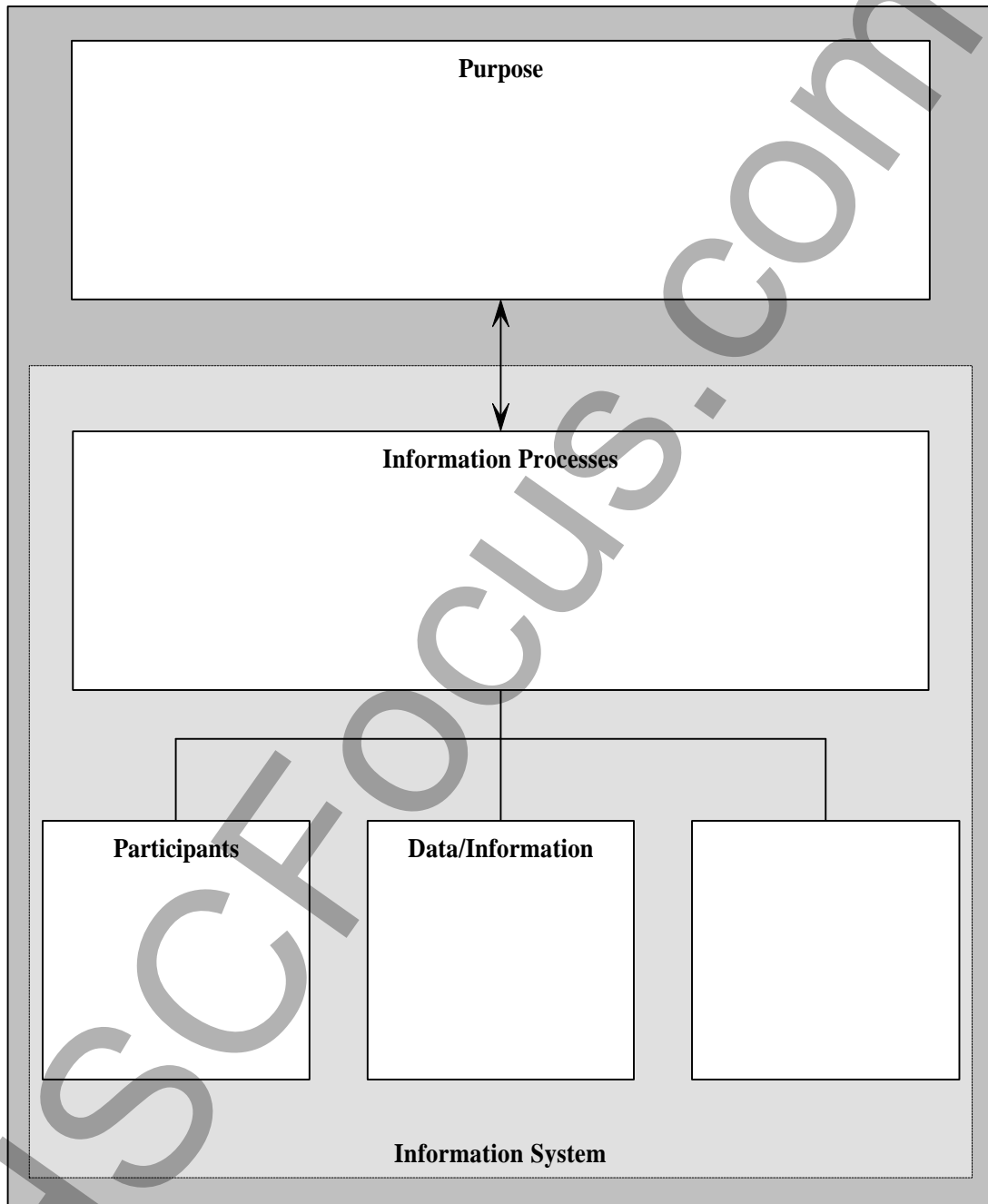
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¹ Safety Inspection Report.

² Compulsory Third Party Personal Injury Insurance Policy.

- (b) (4 marks) Complete the following diagram representing the RTA information system in context.

RTA Database Information System



- (c) (4 marks) Draw a data flow diagram representing the process of renewing a vehicle's registration.

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23. (10 marks) 'qMoney' is an online bank which allows its customers secure Internet access to their accounts. Customers can transfer funds between authorised accounts, make bill payments and apply for loans online. Personal computers allow customers access to their 'qMoney' account via a login name and password.

(a) (1 marks) Identify the transmission medium that this communication system uses.

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(b) (4 marks) List and describe 3 pieces of information technology required to support communication between the participants of this system. Use a diagram to represent the relationship between the technologies.

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(ii)
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(iii)
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(iv)

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24. (10 marks) Use the Appendix article entitled “Content-Filtering Firm Exits Deal To Mine Student Data” to complete the parts of this question.

(a) (2 marks) What social issues is this article discussing?

(i)

(ii)

(b) (3 marks) Why do you think “The American Civil Liberties Union (ACLU) and the American Library Association (ALA) have promised to fight the new law in court.”

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(c) (5 marks) Discuss the social and technological merits and problems of introducing content-filtering software such as ‘Class Clicks’ into educational institutions.

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Content-Filtering Firm Exits Deal To Mine Student Data

Saturday 24 February 10:11 AM

N2H2 Inc., the Internet content-filtering company that last month drew criticism for its plan to sell aggregated Web surfing data gleaned from the thousands of US schools that use the company's filtering software, says it will stop collecting the data.

At issue is a program called "Class Clicks," a contract N2H2 entered into with Web research and marketing firm Roper Starch Worldwide to sell aggregated data on the Web surfing habits of school kids, whose schools use N2H2's content filtering software.

"We looked at this as a distraction from our primary focus of developing our filtering technologies," said Alan Goldblatt, director of corporate communications for N2H2. "Our business is built upon protecting kids online, and there is no way we ever, or would have ever jeopardized their privacy."

The issue came to a head in January when the Electronic Privacy Information Center (EPIC) learned that the US Department of Defense had contracted with the two companies to learn more about click-through rates to DoD [Department of Defence] Web sites and to assist its own advertising and recruitment efforts.

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Gary Ruskin, director of the Washington, DC-based Commercial Alert, said he recently received a response to a letter he sent to Defense Secretary Donald Rumsfeld requesting an end to the collaboration between the DoD and N2H2.

"Prior to the news articles that were recently published, we believed that Class Clicks was a commonly used market research service," wrote W.S. Sellman, director of policy for the assistant secretary of defense. "Upon further investigation, we realized that it is a new concept. At this point, we are delaying our decision about participating in the Class Clicks project, indefinitely."

N2H2 stirred public protest not long ago when it introduced its "Best Partners," program, a service that offered schools free Web filtering technology in exchange for serving banner ads on school computers. The company pulled the plug on that program soon after it began, and is slated to have phased it out completely by June 2001.

The issue of student Internet privacy takes on added urgency in the face of a law passed late last year, which requires schools receiving federal funding for Internet access to install content filters on all computers.

The new law was enacted last year as an addendum to a massive congressional spending package that funds the departments of Labor and Health and Human Services. It states that schools and libraries offering access to the Internet must install content filters before receiving e-rate funds. The "E-rate" program provides subsidies to help connect poor and rural public schools and libraries to the Internet.

The American Civil Liberties Union (ACLU) and the American Library Association (ALA) have promised to fight the new law in court, although neither group has yet taken formal legal action.

Ruskin said while N2H2's decision to end its "student-snooping" program was certainly the right thing to do, the new law will likely pose a much bigger challenge.

"I do think that when trying to decide whether or not put filters in schools we ought not to allow occasion of protecting kids from porn to open them up to other corporate predators who wish to harvest market research from them," Ruskin said.

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