Information, Processes and Technology
HSC Half-yearly Examination

Section I
Total Marks: 20
- Attempt Questions 1 –20
- Allow about 40 minutes for this section

Section II
Total Marks: 40
- Attempt Questions 21 – 24
- Allow about 1 hour and 10 minutes for this section

General Instructions
- Reading time – 5 minutes
- Working time – 1 hour and 50 minutes
- Write using blue or black pen

Section I

Total marks: 20
Attempt Questions 1 – 20
Allow about 40 minutes for this section
Use the multiple-choice answer sheet provided.

1. At what stage in the development of a project would a prototype be **first** used?

    A. Developing the project plan.
    B. Implementation of the project.
    C. Understanding the problem.
    D. The feasibility study.

2. An Internet based telephone directory is an example of an Information System. A participant within this system would be;

    A. A person involved in creating and / or maintaining the system.
    B. Hardware or software that enables the system to function.
    C. Someone accessing the site to obtain a telephone number.
    D. The person whose details were returned as a result of a search.

3. The following is a tool often used in designing a system.

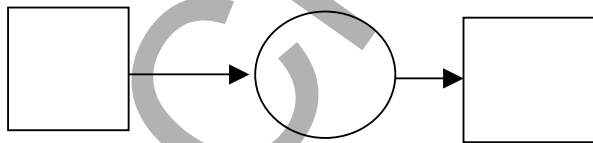 | Data Item | Description | Example |
    |-----------|-------------|---------|
    | Address | Number, Street and Suburb | 9 Rose Av. |
    | Postcode | Four digit number | 2145 |
    | Surname | Last name of client | Tran |
    | Last | Date of last contact (dd/mm/yyyy) | 02/03/2001 |

    What is the name of this type of tool?

    A. Decision table
    B. Context table
    C. Gantt Chart
    D. Data dictionary

4. Quick Edit is a video editing company specialising in digital video effects. The company was hoping to allow it's graphic artists to work from home by remotely access the companies computers over a standard telephone line. A feasibility study found that data transfer rates over standard telephone lines were too slow for this to be practical. This project is therefore unfeasible because;

    A. It can not be implemented in the available time.
    B. It is not technically feasible.
    C. It does not fit the objectives of the company.
    D. It is not supported by the participants.

5.   What protocol is used to download data from a remote site?

        A.   Data loading protocol
        B.   File transfer protocol
        C.   Handshaking protocol
        D   File conversion protocol

6.   Which of the following best describes a gateway?

        A.   A device that provides a central point for a network.
        B.   A device that accepts a signal from a transmission medium.
        C.   A device that connects two LANs using the same protocol.
        D.   A combination of hardware and software that connects networks that use different
                protocols.

7.   Which list contains only network topologies?

        A.   Ethernet, ring, bus
        B.   Token ring, bus, star
        C.   Ring, bus, star
        D.   Ethernet, token ring, star

8.   Recently in the news it was revealed that some doctors were selling their patient records to
        large medical companies without their knowledge.

        What social and ethical issues are involved with this practice?

        A.   The changing nature of work, copyright, privacy
        B.   The changing nature of work, ethics, computer crime
        C.   Ethics, data security and privacy
        D.   Ethics, data security and copyright

9.   Ensuring that information conforms to the data dictionary descriptions is known as:

        A.   data integrity
        B.   data security
        C.   data validation
        D.   data verification

10   In designing a database, which of the following need to be defined in a data dictionary?

   A.   name of each record, length of each record, type of data to be stored in each record, number of decimal places to be stored in numeric records

   B.   name of each field, length of each field, type of data to be stored in each field, number of decimal places to be stored in numeric fields

   C.   numbers of records to be used, number of fields in each record, type of data to be stored in each record in each field, number of decimal places to be stored in numeric fields

   D.   length of each field, type of data to be stored in each field, number of characters in an alphabetic field, length of the database file

11.   A department store has an Information Desk where customers requiring information about the location of products can ask the attendant at the desk for help. The store wishes to replace the Information Desk with a computer based system consisting of numerous touch screen terminals located throughout the store. Initially both systems operated together then, after some months, the help desk was removed.

   What name is given to this type of conversion method?

   A.   Pilot.
   B.   Direct.
   C.   Parallel.
   D.   Phased.

12.   In the data flow diagram shown below which of the following meanings could be assigned to the circular symbol.
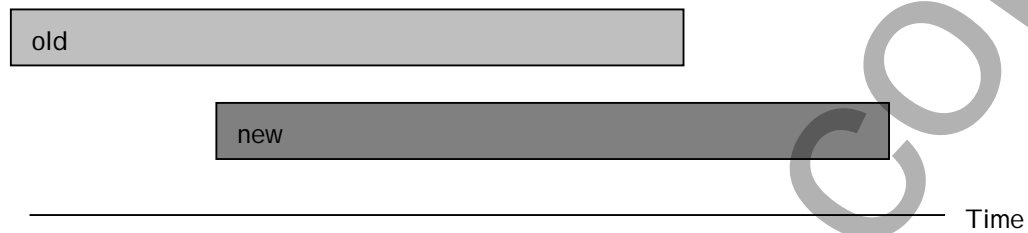

   A.   Sales person.
   B.   Stock database.
   C.   Barcode.
   D.   Calculate price.

13. Before two connected computers can communicate, the following set of variables MUST be compatible.

    A. Baud rate, parity, data bits
    B. Data bits, parity, computer platforms
    C Parity, baud rate, communications software package
    D Communications software package, computer platforms, baud rate

14. Application software accessed by many terminals across a network requires a

    A. file server.
    B mail server.
    C print server.
    D communication server.

15. What is the best way for a high school to organise data about students and the subjects they study at school.

    A. on the school website
    B. in a relational database
    C. in a flat-file database
    D. as hypermedia

16. Cyclic redundancy check is an error detection method that:

    A. uses a division process
    B. counts the number of bits in a data packet
    C. checks for redundant data
    D. performs a check in cycles

17. Which of the following is an example of metadata in a relational database?

    A. the result of a query
    B. a database record
    C. data unnecessarily duplicated
    D. a schema showing relationship between files

18. The term that describes the moral principles that should be considered when using information is:

    A. ethics
    B. privacy
    C. security
    D. copyright

19. The process where business search and analyse vast quantities of data to establish trends or patterns is called:

   A. data manipulation
   B. data mining
   C. data validation
   D. reporting

20. Consider the following diagram.

old	

	new	

Time

This diagram is a description of:

   A. phased system conversion
   B. parallel system conversion
   C. pilot system conversion
   D. direct system conversion

Section II

Total Marks (40)
Attempt Questions 21 – 24
Allow about 1 hour and 40 minutes for this section

Answer each question on a SEPARATE sheet of paper. If you include diagrams in your answer, ensure that they are clearly labelled.

Question 21   (10 marks)   Start a NEW page   Marks

Heather and Helen are going to Canberra for a holiday and are looking for accommodation for themselves. While they are in Canberra, they want to visit the art gallery and do some shopping. They have looked at the various types of accommodation available and have produced the following list.

The following information is a sample of data from THE ACCOMMODATION FILE database at Canberra Tourism.

Name	Type	Facilities	Room Type	Room rate	Notes
Rydges	Hotel	Shower	Twin	178	Near Art Gallery. Room rate includes breakfast.
Northbourne Lodge	Bed and breakfast	Shower	Twin	65	5km from City centre and shops.
City Walk	Back packer	Shared	Twin	47	In centre of City, near shops.
Parklands	Apartments	Bath	2 bed room	140	Close to Parliament House and Art Gallery.
White Ibis	Holiday Park	Shower	2 bed room cabin	90	Close to miniature village. Tennis courts and BBQ area.
Canberra Retreat	Holiday Park	Spa bath	2 bed room Villa	130	Swimming pool, tennis courts, BBQ area. 10km from City centre.
Waldorf	Apartment	Spa bath	2 bed room	150	Close to Art Gallery
Parkside	Hotel	Bath	Twin	190	Swimming pool, gym. Near gardens and shops.
Acacia	Motel	Shower	Twin	81	Large rooms, includes light breakfast. Close to City centre and shops.

(a)   i.   Sort the table in ascending order of cost. What is the name of the third   2
              accommodation listed after sorting?

ii.   Write down the result of the following query

        SELECT Name, Room Type
        FROM Accommodation file
        WHERE Room Rate >="120" and Type ="Hotel"

(b)   A touch screen information desk is to be provided in the Canberra Tourism site.   4
        Would a database management system (DBSM) approach or a hypermedia approach
        be more feasible for this purpose? Justified your recommendation.

(c)   A local high school is using a relational database management system to store the following
        information about its students: Roll Class, Surname, First Name, Guardian's Name, Address,
        Student's Date of Birth, Gender, Sport House, Emergency-contact telephone Number, Mailing
        Name, List of Subjects offered, and subjects in which students are enrolled.

        Describe the problems that may arise for the way in which data is stored in the   4
        relational-database management system, and normalise the data structures into
        multiple tables that will overcome any potential problems. Show the fields in each
        of the tables.

Question 22   10 Marks   Start a NEW page.

The Roads and Traffic Authority (RTA) is a large organisation that uses a database information systems. Its purposes are to ensure vehicle safety and provide individuals with a driver's Licence once they have met the necessary requirements.
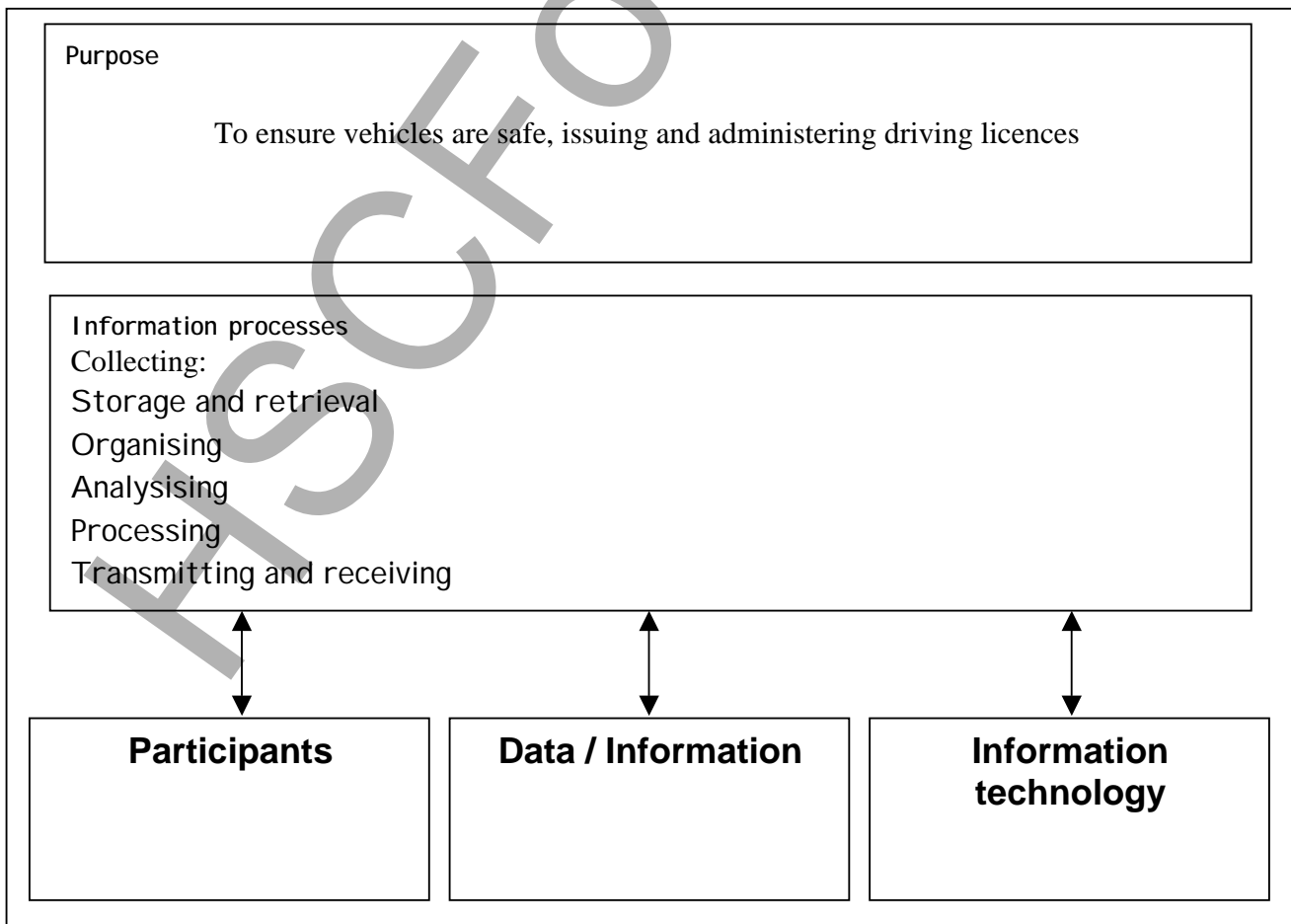
The environment of the Roads and Traffic Authority is throughout its offices in New South Wales and its interactions with other organisations such as the police department, insurance companies and motoring authorities.

Each RTA office has a direct link to a central database that is used to store the details of each vehicle, such as plate, model and engine numbers. An entity also exists to store information about holders of driver's licences, such as the licence number, name, address and expiry date.
One important operation that is performed is the issuing of licence and vehicle registration renewals.

When transactions take place the data is entered into the computer at that RTA office. This data is automatically updated using offline storage. There is also a real-time transaction processing system in place to cater for people paying with credit and debit cards. At the end of the day, the data from each RTA office is transferred to the central database.

The Roads and Traffic Authority provides and maintains a Web site containing information for the public that is generated from the central database.

The diagram summarises some aspects of this information system.

Purpose
To ensure vehicles are safe, issuing and administering driving licences

Information processes
Collecting:
Storage and retrieval
Organising
Analysising
Processing
Transmitting and receiving

Participants	Data / Information	Information technology

(a)   Identify the participants of the system and explain how the information system   2
        meets their needs.

(b).   Detail the information technology that would be used by the Roads and Traffic   2
        Authority and discuss how they are used to process data in this system.

(c)   Outline the different ways data may be displayed in this system.   3

d).   Discuss some of the social and ethical issues that the Roads and Traffic Authority   3
        would face if it was allowed to sell the contents of their database to other
        organisations.

Question 23 (10 marks) Start a NEW page Marks

World School is a virtual organisation that conducts its business entirely over the Internet. A screenshot of the site is taken below.

(a) World School is described as a homework-help site. 1

    i. List ONE advantage that this site would have over a conventional homework centre.

    ii. Outline TWO security issues that could be encountered whilst using this site and how they would be overcome. 2

(b) Two computers are sending data on a LAN at the same time. Contrast the method used by the token ring protocol with that taken by the Ethernet protocol. 2

(c) A software company is using an FTP protocol to distribute its software from a website. Many of the customers trying to download the software are reporting slow download times and errors in the transmitted data. A software analyst is hired to investigate the problem and suggests that there could be two separate areas:

- Speed of data transfer
- Error checking

    i. Evaluate EACH of the three types of error checking methods and suggest the best method to solve the above problem JUSTIFY your selection. 4

    ii. Outline HOW the baud rate settings on the customers computer may be affecting the bits per second downloading speed. 1

Question 24   **10 Marks**   Star a NEW page

(a)   When developing a project management plan it is essential that there is adequate communication between the development team and the participants of the system. To achieve this various communication strategies are employed. Describe the following strategies,

   i.   Active listening   2
   ii.   Team building

b)   A prototype is tool used in developing information systems.

   i.   Describe what is a prototype   4
   ii.   Explain three roles of a prototype within the development process.

c)   The introduction of a computer based system within a work place can often generate   4
        fear and non-acceptance amongst participants. Describe two issues that might
        contribute to the participants fears and steps that could be taken to minimize them.

Marking Guidelines for Information Processes and Technology

Question 21

In your answer you will be assessed on how well you:

- Sort and search a database
- Understand the difference between a relational database management system and hypermedia and be able to justify you answer.
- Identify problems when storing data using a relation database management system.
- Construct multiple tables to store the data.

Question 22

In your answer you will assess on how well you:

- Identify the participants of the information system
- Explain the needs of these participants
- Identify the information technology used in the information system.
- Discuss how the information technology used to process the data within this system
- Identify methods used to display the data/information within the system.
- Describe the social and ethical issues involved when selling a database to other organisations.

Question 23

In your answer you will be assessed on how well you:

- Understand the difference between virtual and non-virtual organisations
- Outline communication security issues
- Contrast two different LAN protocols
- Evaluate error checking methods
- Outline how baud rate can affect bits per second data transfer

Question 24

a)i)	An interview technique that reflects back the responses of the subject. Non-judgmental, encouraging.	1
a)ii)	A method of increasing cooperation amongst group members and encouraging the adoption of roles.	1

b) i	A limited working model of an information system	1
b) ii	A prototype is used when the problem is not easily understood. Prototypes help clarify participant's understanding of the system. Used in an ongoing cycle of feedback and modification.	3
	Only two roles of prototypes are outlined.	2
	Only one role is outlined	1

c)	Two social or ethical issues are described along with two suggested management strategies that relate to each issue.	4
	Two social or ethical issues are described along with two suggested strategies where one or both are only loosely related to the issues.	3
	Two social or ethical issues are described but no strategy for dealing with them is suggested.	2
	One social or ethical issue is described along with a related management strategy.	2
	One social or ethical issue is described but no strategy for dealing with it is suggested.	1