

BOARD OF STUDIES
NEW SOUTH WALES

2001 HSC Specimen Paper

**Information Processes
and Technology**

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Information Processes and Technology

Introduction

This booklet contains the specimen examination paper for the 2001 Higher School Certificate examination in Information Processes and Technology. A mapping grid is also included, showing how each question in the examination relates to the syllabus outcomes and content, and to the performance bands.

The specimen paper shows the format of the New HSC examination. It has been printed on A4 paper and side-stapled to make it convenient for use in schools. Actual examination papers will be produced as A4 booklets. All New HSC papers will be printed on white paper.

The 2001 HSC specimen papers have been produced in accordance with the Board's *Principles for Setting HSC Examinations in a Standards-Referenced Framework*, published in Board Bulletin Volume 8 Number 9 (Nov/Dec 99). Questions are closely related to the outcomes of the course, and the paper as a whole is structured to allow for appropriate differentiation of student performance at all levels on the performance scale.

The papers have been designed so that students have a clear understanding of what they are required to do in each question and in working through the paper. Instructions have been standardised, and the demands of the questions have been made explicit. Key words in questions, such as 'discuss', 'analyse', and 'explain', have been used consistently in accordance with the glossary published in the Board's *Assessment Support Document*.

This specimen paper is an example of the type of examination that could be prepared within the examination specifications in the Information Processes and Technology syllabus. Examinations will be based on the syllabus, and will test a representative sample of syllabus outcomes. Therefore, the range and balance of outcomes tested in HSC examinations in 2001 and subsequent years may differ from those addressed in the specimen paper.

The mapping grid is an important feature of the development of the examination. It aids in ensuring that the examination as a whole samples a range of content and outcomes, and allows all students the opportunity to demonstrate their level of achievement. Where courses have components in the examination other than written papers, the grid indicates the wider range of outcomes that are assessed by including these other components.

There are a number of points to note in considering the Information Processes and Technology specimen paper:

- The number of parts to the questions has been kept to a minimum. The questions now require more integrated answers, giving students the opportunity to show higher-order thinking skills.

- The inclusion and order of questions on particular topics in Sections I and II is not prescriptive and may vary from year to year.
- The number of question parts and sub-parts in the questions in Sections II and III may vary both from question to question and from year to year.

Information Processes and Technology

HSC Specimen Examination Mapping Grid

For each item in the examination, the grid shows the marks allocated, the syllabus content and syllabus outcomes it relates to, and the bands on the performance scale it is targeting. The range of bands shown indicates the performance candidates may be able to demonstrate in their responses. That is, if an item is shown as targeting Bands 3 – 5, it indicates that candidates who demonstrate performance equivalent to the Band 3 descriptions should be able to score some marks on the item, while those who perform at Band 5 or above could reasonably be expected to gain high marks. In the case of one-mark items, candidates who demonstrate performance at or above the bands shown generally could be expected to answer the item correctly.

Question	Marks	Content	Syllabus outcomes	Targeted performance bands
1	1	Project Work – making decisions	H5.1	3 – 4
2	1	Project Work – making decisions	H6.2	3 – 4
3	1	Project Work – project management	H7.2	2 – 3
4	1	Project Work – implementing	H6.2	2 – 3
5	1	Information Systems and Databases – organisation methods	H1.1	3 – 4
6	1	Information Systems and Databases – organisation methods	H2.2	3 – 4
7	1	Project Work – understanding the problem	H5.1	2 – 3
8	1	Communication Systems – examples of	H1.1	3 – 4
9	1	Information Systems and Databases – organisation methods	H1.2	3 – 4
10	1	Information Systems and Databases – issues related to	H5.2	4 – 5
11	1	Information Systems and Databases – organisation methods	H1.1	3 – 4
12	1	Information Systems and Databases – information systems	H1.1	4 – 5
13	1	Information Systems and Databases – issues related to	H3.1	2 – 3
14	1	Project Work – designing solutions	H6.2	3 – 4
15	1	Communication Systems – transmitting and receiving in	H1.1	2 – 3
16	1	Communication Systems – transmitting and receiving in	H1.1	4 – 5
17	1	Communication Systems – issues related to	H3.1, H5.2	4 – 5
18	1	Communication Systems – issues related to	H5.2	5 – 6
19	1	Communication Systems – characteristics of	H1.1	4 – 5
20	1	Communication Systems – characteristics of	H1.1	5 – 6
21(a)	1	Information Systems and Databases – storage and retrieval	H1.1, H2.2	2 – 3
21(b)	4	Information Systems and Databases – storage and retrieval	H2.1, H4.1	2 – 5
21(c)	5	Information Systems and Databases – organisation methods	H1.1, H2.2	3 – 6
22(a)	2	Information Systems and Databases – examples of database information systems	H1.1, H1.2, H2.1	2 – 3
22(b)	4	Information Systems and Databases – other information processes for database information systems	H1.1, H1.2, H2.1	2 – 4

Question	Marks	Content	Syllabus outcomes	Targeted performance bands
22(c)	4	Information Systems and databases – issues related to information systems and databases	H2.1, H3.1, H5.2	2 – 5
23(a)	1	Communication Systems – transmitting and receiving	H1.1, H1.2, H2.1	2 – 3
23(b)	4	Communication Systems – examples of communication systems	H1.1, H1.2, H2.1, H2.2	2 – 5
23(c)	5	Communication Systems – issues related to communication systems	H1.1, H1.2, H3.1, H5.2	2 – 6
24(a)	3	Project Work – understanding the problem	H1.1, H1.2, H7.2	2 – 4
24(b)	4	Project Work – designing solutions	H2.2, H3.1, H3.2, H7.2	2 – 5
24(c)	3	Project Work – implementing	H2.2, H3.1, H4.1, H6.2, H7.2	3 – 6
25(a)(i)	2	Transaction Processing Systems	H1.1, H2.1	2 – 4
25(a)(ii)	2	Transaction Processing Systems	H1.2, H2.2	2 – 3
25(b)(i)	3	Transaction Processing Systems	H1.1, H1.2, H2.1	2 – 5
25(b)(ii)	4	Transaction Processing Systems	H2.1, H2.2	4 – 6
25(b)(iii)	4	Transaction Processing Systems	H6.1	4 – 5
25(c)	5	Transaction Processing Systems	H1.1, H2.1, H2.2	3 – 6
26(a)(i)	4	Decision Support Systems	H1.1, H1.2	3 – 5
26(a)(ii)	4	Decision Support Systems	H1.1, H1.2	3 – 6
26(b)	4	Decision Support Systems	H1.1, H1.2, H2.1	3 – 5
26(c)	8	Decision Support Systems	H1.1, H1.2, H2.1, H2.2, H4.1	2 – 6
27(a)(i)	2	Automated Manufacturing Systems	H3.1	2 – 4
27(a)(ii)	5	Automated Manufacturing Systems	H1.1, H1.2, H2.1	3 – 6
27(b)(i)	3	Automated Manufacturing Systems	H1.1, H1.2	3 – 5
27(b)(ii)	2	Automated Manufacturing Systems	H1.1, H1.2	4 – 6
27(c)(i)	3	Automated Manufacturing Systems	H2.1	3 – 4
27(c)(ii)	5	Automated Manufacturing Systems	H1.1, H1.2, H2.1, H2.2	2 – 6
28(a)(i)	3	Multimedia Systems	H1.1, H2.2	3 – 4
28(a)(ii)	2	Multimedia Systems	H1.1, H3.1, H3.2, H5.2	4 – 5
28(b)(i)	3	Multimedia Systems	H1.1, H2.1, H2.2	3 – 5
28(b)(ii)	4	Multimedia Systems	H1.1, H3.1, H4.1, H5.2	2 – 6
28(c)	8	Multimedia Systems	H1.1, H1.2, H2.2, H3.1, H4.1, H5.2	2 – 6



Sample marking guidelines for Information Processes and Technology

The following marking guidelines have been developed for selected questions from the 2001 HSC Specimen Examination in Information Processes and Technology. These guidelines indicate the approach that would be taken to marking questions.

For each question, the following are typically included:

1. The syllabus outcomes that are targeted by the question.
2. The assessment rubric from the specimen paper, where there is one, listing the set of general criteria that are used to assess responses.
3. The marking guidelines, which show the criteria to be applied to responses along with the marks to be awarded in line with the quality of the responses. For extended-response questions, performance is described at a number of levels of performance, each covering a range of marks.
4. A sample answer or some points that answers might include. Sample answers indicate the scope and depth of treatment expected, and are not intended to be prescriptive. Similarly, the points that could be included in answers are not intended to be an exhaustive list, but rather an indication of the considerations that students could include in their responses.

Marking guidelines will generally require some refinement at the Marking Centre to take account of unanticipated responses that students present. For essay-type questions, the standard described at each mark range will be made clear during pilot-marking by the selection of sample scripts.

In a standards-referenced framework, examination questions are closely linked to syllabus content and outcomes. Expectations of the question are to be clear in the wording of the question. Marking guidelines will be developed at the same time as the examination questions, by examination committees. The development of marking guidelines will be guided by the Board's *Principles for Developing Marking Guidelines Examinations in a Standards-Referenced Framework*, published in Board Bulletin Volume 9 Number 3 (May 2000).

Sample Marking Guidelines – Information Processes and Technology

Question 23 (10 marks)

Marks

Net Returns is an accounting company that specialises in individual and small-business tax returns. The accountants employed by Net Returns do not work in an office. Each accountant carries a laptop and accesses the Internet using a mobile phone. Tax returns are lodged electronically to the taxation office using the Internet.

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

Outcomes assessed: H1.1, H1.2, H2.1

MARKING GUIDELINES

Criteria	Marks
<ul style="list-style-type: none"> • Identifies an appropriate example of a wireless transmission medium that this communication system may use, such as radio or microwave 	1

- (b) Identify the participants in this system and describe the information technology required to support communication between them. You may use a diagram. 4

Outcomes assessed: H1.1, H1.2, H2.1, H2.2

MARKING GUIDELINES

Criteria	Marks
<ul style="list-style-type: none"> • Identifies the main participants • Describes at least three relevant information technologies, providing characteristics or features of each and interrelationships between technologies 	4
<ul style="list-style-type: none"> • Identifies the main participants • Describes two relevant information technologies, providing some characteristics or features of each <p>OR</p> <ul style="list-style-type: none"> • Describes at least three relevant information technologies, providing characteristics or features of each and interrelationships between technologies 	3
<ul style="list-style-type: none"> • Identifies the main participants • Describes a relevant technology, providing some characteristics or features <p>OR</p> <ul style="list-style-type: none"> • Describes two relevant information technologies, providing some characteristics or features of each <p>OR</p> <ul style="list-style-type: none"> • Identifies the main participants • Identifies at least three information technologies 	2

Criteria	Marks
<ul style="list-style-type: none"> Identifies the main participants OR <ul style="list-style-type: none"> Identifies at least three information technologies 	1

Answers may include:

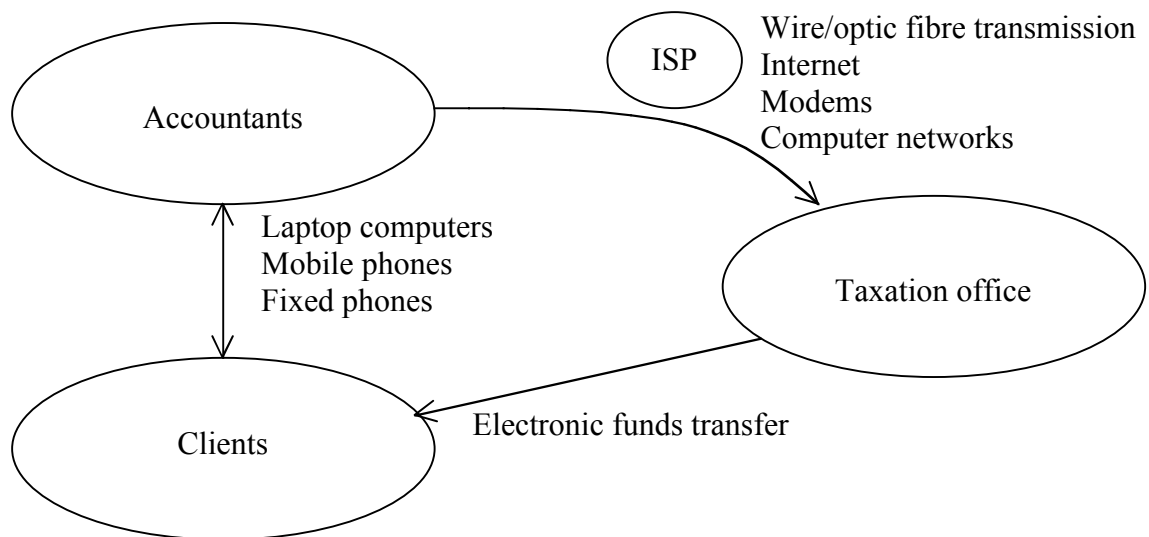
Main participants

- Accountants
- Taxation office

Information technologies *and some characteristics/features/interrelationships*

- Laptop computers, *connects to internet through modem, mobile phone*
- Mobile phones, *connects participants, participants to internet, transmits data, connects wireless and wire transmission mediums, gives mobility to communication system*
- Fixed phones, *connects participants, supports internet, fax machines and mobile phone network*
- Modems, *connect laptops/desktops to internet, requires phone system and computers*
- The internet/networks, *makes connections between computers within organisations and worldwide, internet needs phone system and modems*
- Electronic funds transfer, *money can be accessed by this communication system, uses wire/optic fibre transmission*
- Wire/optic fibre transmission, *back-bone of EFT, internet/networks*

Diagrammatic answers may contain:



Marks

- (c) Explain how this information technology may impact on the accountants employed by Net Returns.

5

Outcome assessed: H1.1, H1.2, H3.1, H5.2

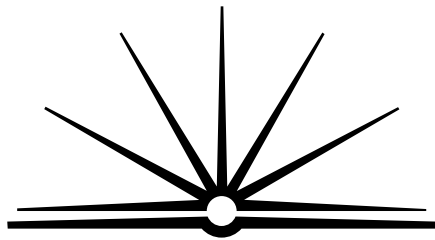
MARKING GUIDELINES

Criteria	Marks
<ul style="list-style-type: none"> • Explains how use of the information technology may bring about several main areas of change • Connects these changes and their effects to the use of the information technology 	4 – 5
<ul style="list-style-type: none"> • Explains two significant ways in which the information technology may impact on accountants • Limited connection between these changes and the use of the information technology 	2 – 3
<ul style="list-style-type: none"> • States one way in which the information technology may impact on accountants. No explanation given. 	1

Answers may include:

Main categories of change: professional, social issues, altered working day, administration factors and ethical issues.

- Removal of professional contacts and support, as accountants may not see or speak to each other from day to day
- The use of this information technology enables an itinerant work style, with accountants travelling from home to clients, and then home, and this may change the length of the working day for accountants (longer or shorter), and may impact on exercise, diet, safety and social interactions
- Lack of a central office may mean that many administrative tasks would need to be done at the accountant's home, transferring many of the site costs that accompany a central office to the accountant's domestic residence
- Alienation or lack of identification of the accountants with 'net returns' as an entity
- Greater possibility of unethical professional behaviour, such as revealing client details, as there would be less supervision



B O A R D O F S T U D I E S
NEW SOUTH WALES

2001
HIGHER SCHOOL CERTIFICATE
SPECIMEN EXAMINATION

Information Processes and Technology

General Instructions

- Reading time – 5 minutes
- Working time – 3 hours
- Write using blue or black pen

Section I Pages 2 – 10

Total marks **(20)**

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

Section II Pages 11 – 13

Total marks **(40)**

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

Section III Pages 14 – 18

Total marks **(40)**

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

Section I

Total marks (20)

Attempt Questions 1 – 20

Allow about 40 minutes for this section

Use the multiple-choice answer sheet.

Select the alternative A, B, C or D that best answers the question. Fill in the response oval completely.

Sample $2 + 4 =$ (A) 2 (B) 6 (C) 8 (D) 9
 A B C D

If you think you have made a mistake, put a cross through the incorrect answer and fill in the new answer.

A B C D

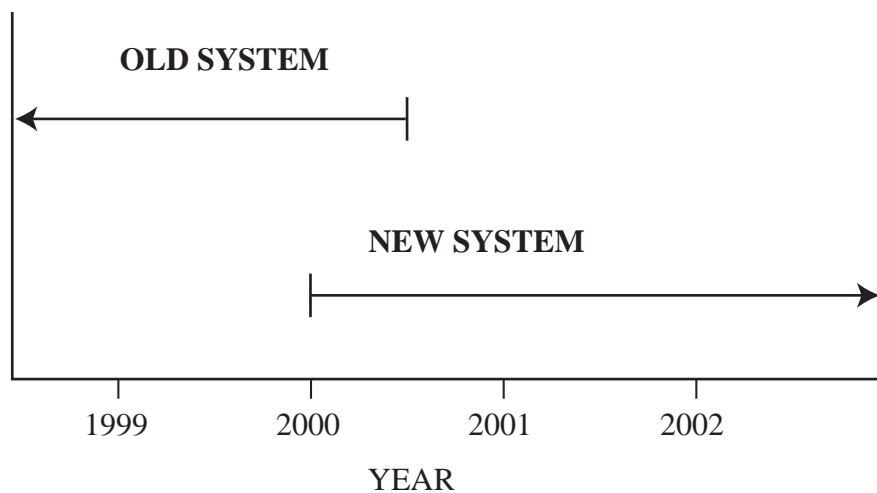
If you change your mind and have crossed out what you consider to be the correct answer, then indicate this by writing the word *correct* and drawing an arrow as follows:

A B ^{*correct*} C D

- 1 A Web-based mail-order company is investigating the most appropriate way for employees to conduct internal communication.

What is the most likely reason for the company to reject a paper-based system?

- (A) It is not economically feasible.
 - (B) It is not technically feasible.
 - (C) It does not fit the company's objectives.
 - (D) It is not a feasible solution in the available time frame.
- 2 At what point in the development of a project would the details of the time frame, and the identification of participants and data be first considered?
- (A) Feasibility study
 - (B) Operation manual
 - (C) Project plan
 - (D) Project prototype
- 3 As part of a project, a student has included the following diagram that illustrates the conversion of an old system to a new system.



What is this type of diagram called?

- (A) Decision table
- (B) Gantt chart
- (C) Schematic diagram
- (D) System flowchart

- 4 An organisation has decided to systematically replace each employee's desk-top computer with a laptop computer over a three-year period. When each desk-top reaches a certain age, it is replaced with a new laptop.

What name is given to this type of conversion method?

- (A) Pilot
- (B) Direct
- (C) Parallel
- (D) Phased

- 5 The uniform resource locator used to find the syllabus for this course is

http://www.boardofstudies.nsw.edu.au/syllabus99/infoprotech_syl.pdf

The segment '*www.boardofstudies.nsw.edu.au*' is the

- (A) URL.
- (B) hypertext transfer protocol.
- (C) name of the resource file.
- (D) domain name of the server containing the resource.

- 6 What is the best way for a university to organise data about students and the courses in which they are enrolled?

- (A) On a course website
- (B) In a relational database
- (C) In a flat-file database
- (D) As hypermedia

- 7 A company has decided that its information system is inadequate for its future needs. The participants in the system are uncertain of their requirements for the new system.

What would be the best approach to help solve this problem?

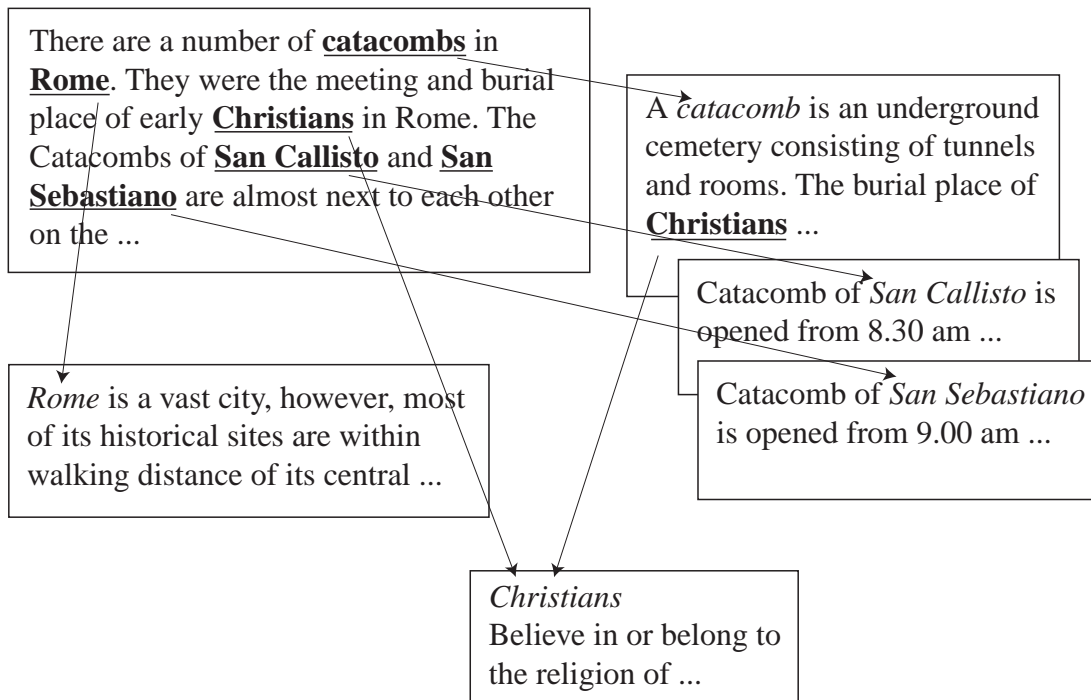
- (A) Construct a project plan for developing the new system.
- (B) Tell the participants what their requirements are.
- (C) Construct a prototype of an improved information system.
- (D) Interview the participants, using active listening skills.

- 8** Where does electronic mail reside when a web-based mail package is used?
- (A) On the sender's computer
 - (B) On the receiver's computer
 - (C) On an intermediate computer
 - (D) On the Internet service provider's computer
- 9** Which of the following is an example of metadata in a relational database system?
- (A) The result of a query
 - (B) A database record
 - (C) Data unnecessarily duplicated
 - (D) A schema showing relationships between files
- 10** A school library's 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 issues does this set-up involve?

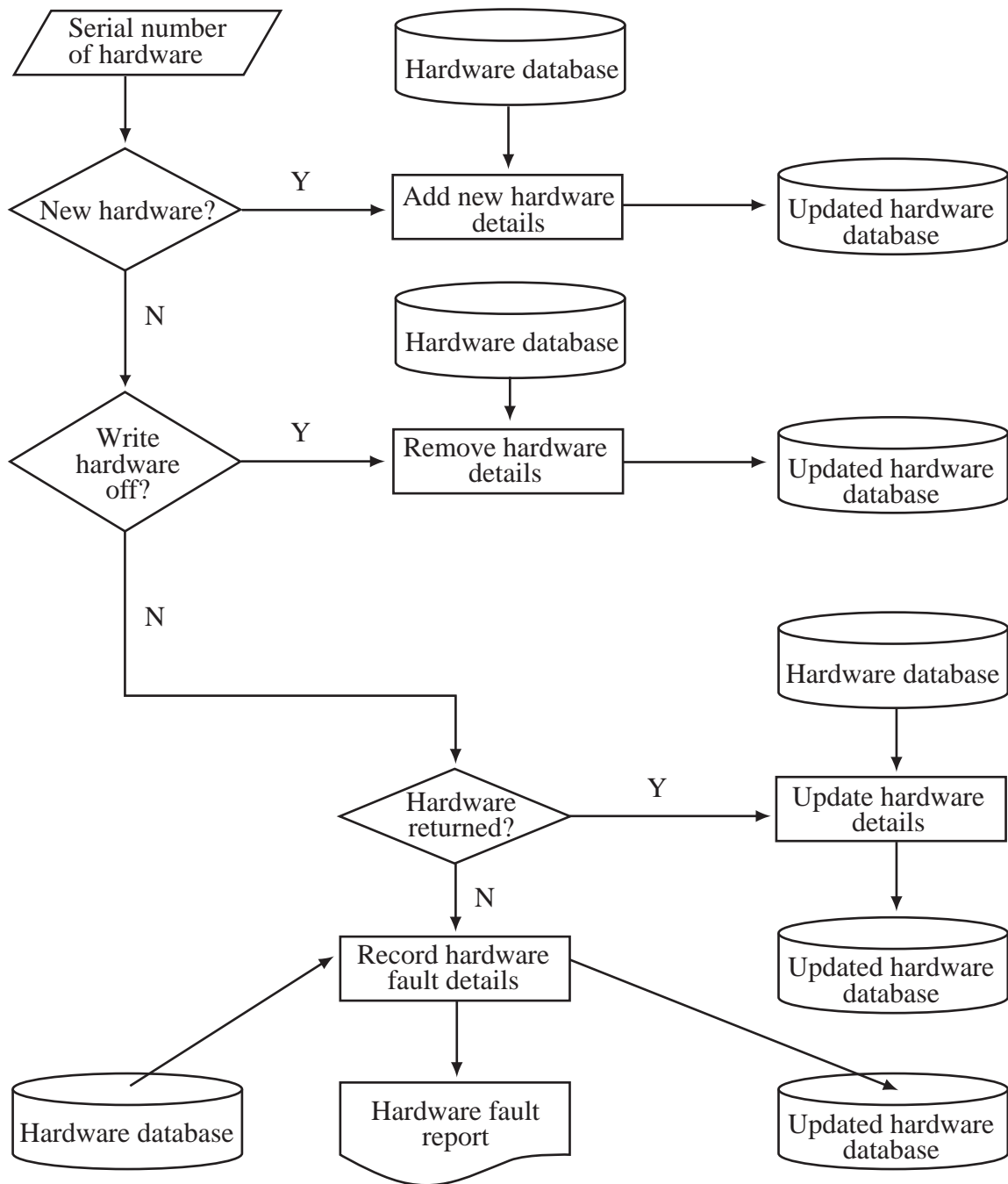
- (A) Data security, ethics and privacy
- (B) Ethics, computer crime and copyright
- (C) The changing nature of work, power and control, and ethics
- (D) The changing nature of work, power and control, and privacy

11 What type of data organisation method is illustrated by the following diagram?



- (A) Hypertext
- (B) Flowchart
- (C) Top-down design
- (D) Relational database

- 12 An organisation uses a relational database to track computer hardware. The use of this information system is represented by the following system flowchart.

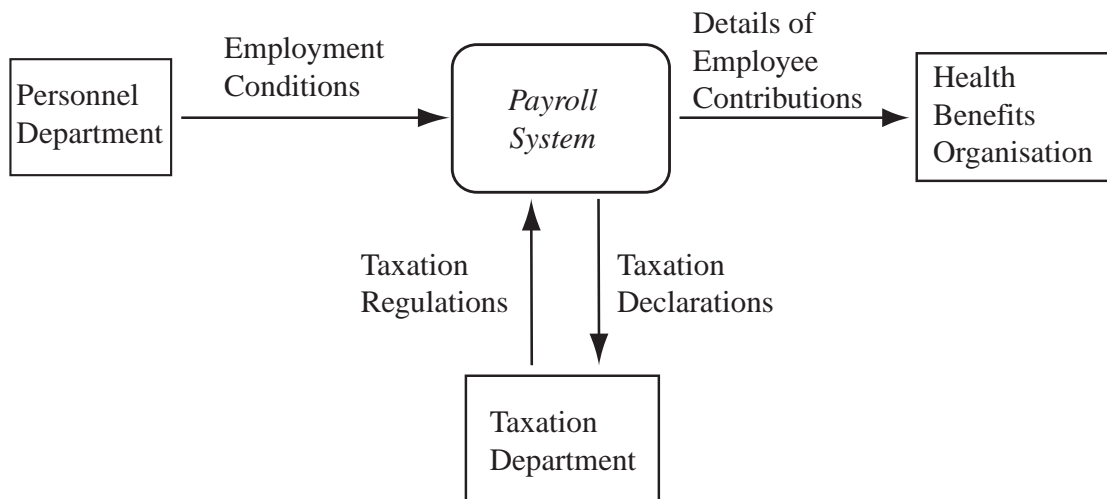


Which of the following best describes what hardware events are tracked by this relational database?

- (A) Purchase, write-off and placement
- (B) Repair, purchase and placement
- (C) Write-off, repair and placement
- (D) Purchase, write-off and repair

- 13 Which of the following is the best way to validate information retrieved from the Internet?
- (A) Access the information using a variety of search engines.
 - (B) Determine the number of visitors the Internet site has had.
 - (C) Verify information with a variety of other sources.
 - (D) Identify the author of the information.

14



The diagram is a context diagram for a payroll system. What is the main purpose of the arrows in this diagram?

- (A) To show movement of data between processes, external entities and data stores
 - (B) To show movement of data between components of the payroll system
 - (C) To show movement of data between the entities external to the payroll system
 - (D) To show movement of data between the payroll system and entities external to the payroll system
- 15 It has been decided to network a small number of users in an office so that they can all access one database at the same time. A computer is required to control access to this database. What is this computer called?
- (A) File Server
 - (B) Client Server
 - (C) File / Client Server
 - (D) Print / Client Server

- 16 As part of a project, you have to recommend the necessary hardware to connect an existing network with about 25 clients to the Internet. Which of the following would you recommend?
- (A) File server, router, firewall and an ISDN line
 - (B) Mail / web server, router, firewall and computers
 - (C) Mail / web server, router, firewall and an ISDN line
 - (D) Mail / web server, router, computers and a file server
- 17 Internet service providers gather clients' credit card details across the Internet and store these details. They protect these details by creating a file server that
- (A) allows no Internet access.
 - (B) only allows uploading across the Internet.
 - (C) only allows downloading across the Internet.
 - (D) allows both uploading and downloading across the Internet.
- 18 A database has been created by a trading company to assist people buying a car. The database is to be linked to a website on the Internet. A portion of the data dictionary for this database is included below.

FIELD	DESCRIPTION / COMMENTS
Address	Address of current owner
Suburb	Suburb current owner lives in
Advertisement number	Allows present owner to protect their privacy
Make of car	eg Holden
Model of car	eg Barina
Telephone number	Telephone number of current owner
Price	Selling price of car

The most appropriate and ethically responsible display of this information by the trading company on the website would include the fields of

- (A) Address, Suburb, Advertisement number, Make of car and Price
- (B) Suburb, Advertisement number, Make of car, Telephone number and Price
- (C) Suburb, Make of car, Model of car and Telephone number
- (D) Suburb, Advertisement number, Make of car, Model of car and Price

- 19 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) Parity, number of data bits and computer platforms
 - (C) Parity, baud rate and communications software package
 - (D) Communications software package, computer platforms and baud rate

- 20 The following seven-bit ASCII character and parity bit were transmitted as

ASCII character	Parity bit
1011010	0

They were received as

ASCII character	Parity bit
1010010	1

Which statement accurately reflects this situation?

- (A) The data were sent as odd parity and would be interpreted by the receiver as correct.
- (B) The data were sent as odd parity and would be interpreted by the receiver as incorrect.
- (C) The data were sent as even parity and would be interpreted by the receiver as correct.
- (D) The data were sent as even parity and would be interpreted by the receiver as incorrect.

Section II

Total marks (40)

Attempt Questions 21 – 24

Allow about 1 hour and 10 minutes for this section

Answer each question in a SEPARATE writing booklet. Extra writing booklets are available. If you include diagrams in your answer, ensure that they are clearly labelled.

Marks

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

The following information is a sample of the data from the EXHIBITION FILE database for an art exhibition.

EXHIBITION FILE

<i>Fname</i>	<i>Lname</i>	<i>Sex</i>	<i>Address</i>	<i>Date of birth</i>	<i>Died</i>	<i>Title of painting</i>	<i>Type</i>	<i>Frame</i>	<i>Price</i>
Anthony	Kelly	M		20/10/81		Iron Maids	Watercolour	Y	\$200
Anthony	Kelly	M		20/10/81		Wildlife in Action	Oil	N	\$600
Helen	Daddo	F	536 Station St	3/7/36		Orion Night	Watercolour	Y	\$120
Bill	Manz	M	21 Circle Dr	17/11/80		Seasons	Oil	Y	\$110
Janice	Nafir	F	1a Plane St	5/9/22	25/6/95	Awakening	Oil	Y	\$410
Jai	Xu	F		12/3/46		Harvest Ball	Pastel	Y	\$690
Kim	Ho	M		5/6/11	23/2/37	Army Dawn	Oil	Y	\$1500
Kim	Ho	F	7 Tower St	30/8/66		Fallen Idol	Charcoal	N	\$80

(a) Write down the result of the following query. **1**

SELECT Fname, Lname FROM Exhibition file WHERE
Sex = "F" AND Type = "Oil"

(b) A touch screen information kiosk is to be provided in the exhibition area. Would a database management system (DBMS) approach or a hypermedia approach be more feasible for this purpose? Justify your recommendation. **4**

(c) Describe the problems that may arise from the way in which data are stored in the EXHIBITION FILE, and normalise the data structure into multiple tables that will overcome any potential problems. Show only the fields in each of the new tables. **5**

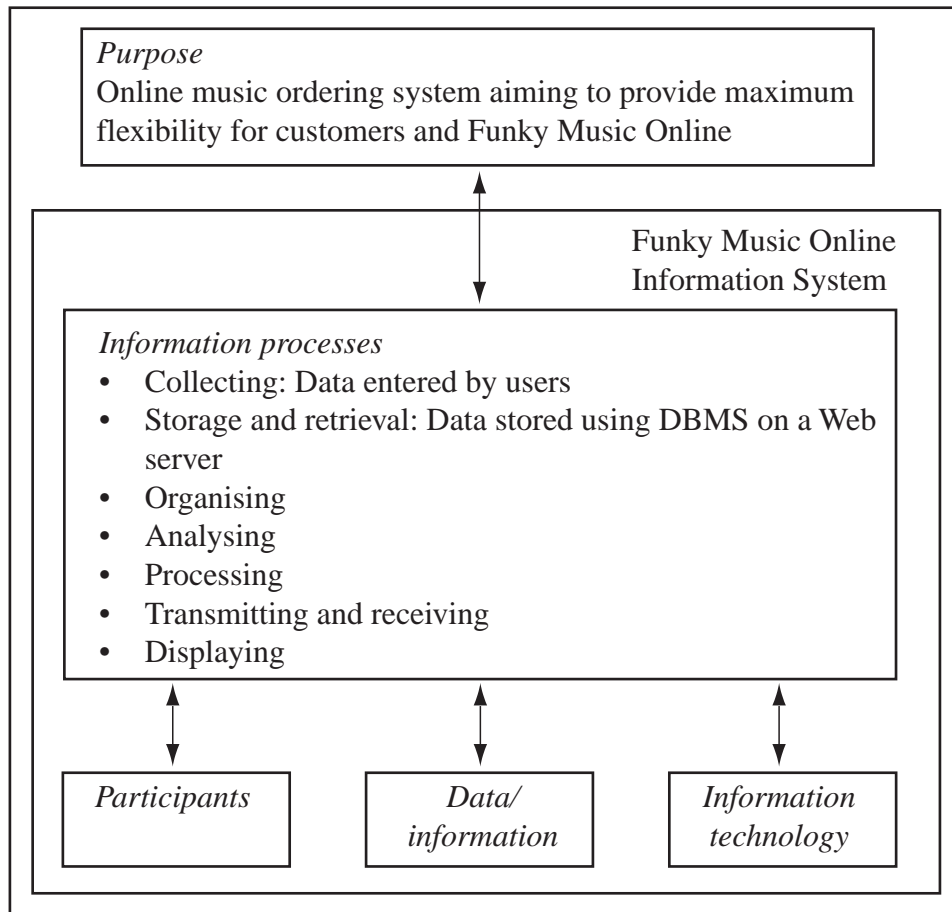
Question 22 (10 marks) Use a SEPARATE writing booklet.

Funky Music Online is a virtual music shop with a dynamic website. The shop sells compact discs to customers throughout the world.

The website for the online shop has a searchable database of compact discs with links to audio files of short samples of selected songs. Each week the database is updated. A recent innovation has been the addition of some video clips to the website.

The company also keeps information about customers on a database, including personal details such as name, address, age and music preferences, and also purchase details such as credit card number and frequency of purchases.

The diagram summarises some aspects of this information system.



- (a) Identify the participants of the system and explain how the information system meets their needs. 2
- (b) Outline the different ways data may be displayed in this system. 4
- (c) Discuss some of the social and ethical issues that Funky Music Online would face if it allowed data mining. 4

Question 23 (10 marks) Use a SEPARATE writing booklet.

Net Returns is an accounting company that specialises in individual and small-business tax returns. The accountants employed by Net Returns do not work in an office. Each accountant carries a laptop and accesses the Internet using a mobile phone. Tax returns are lodged electronically to the taxation office using the Internet.

- (a) Identify the transmission medium that this communication system uses. **1**
- (b) Identify the participants in this system and describe the information technology required to support communication between them. You may use a diagram. **4**
- (c) Explain how this information technology may impact on the accountants employed by Net Returns. **5**

Question 24 (10 marks) Use a SEPARATE writing booklet.

A company sells educational videos to schools and universities. It began operation six years ago with two people. They hand-wrote receipts and used a desk-top computer to process orders. The company grew and now employs twenty people. As the company grew, it gradually bought new computers for its different needs.

The company uses computers to process orders and keep accounting records. It also produces its own videos, catalogues and advertising brochures. The company uses a number of different computer platforms for different tasks.

The manager decides to hire consultants to design and implement a new system to meet the needs of the company, now and in the future. The manager is aware that some staff will be threatened by changes in the workplace, but sees the system upgrade as important to the company's success.

Answer the following questions with reference to your knowledge and experience of project work.

- (a) Describe problems that staff may be experiencing with the current system. **3**
- (b) Make recommendations to the company's management regarding possible approaches that would maximise staff acceptance. **4**
- (c) Describe an approach that could be used to implement the new system in this organisation. Justify the use of this approach. **3**

Section III

Total marks (40)

Attempt TWO questions from Questions 25 – 28

Allow about 1 hour and 10 minutes for this section

Answer each question in a SEPARATE writing booklet. Extra writing booklets are available. If you include diagrams in your answer, ensure that they are clearly labelled.

	Marks
Question 25 — Transaction Processing Systems (20 marks) Use a SEPARATE writing booklet.	
(a) A computer system is set up to make bookings for the theatre. The system can book seats at a show and accept credit card payments, or wait until payment is made by cheque or cash. Bookings can be accepted by telephone, letter or in person.	
(i) Describe how the data for bookings are collected and the type of processing that will be used.	2
(ii) After the data have been collected, what type of application software could be used to process the data, and how would the data be organised?	2

Question 25 continues on page 15

Question 25 (continued)

- (b) A clothing retailer issues handwritten receipts to customers, and keeps a carbon copy. Details of the purchase are entered into an electronic business accounting software package at a later time.

Here is the receipt.

Clothing Inc. 77 Thread Street, Needle Point


Date: _____

Purchase details: _____

Price: \$ _____

Served by: _____

Method of payment: Credit card Cheque Cash



The clothing retailer wants to change to a system that will provide a receipt and enter transaction details into the accounting package.

- (i) Describe the information processes involved in such a system. 3
 - (ii) Describe the steps you would take in planning, designing and implementing a new information system for the clothing retailer. 4
 - (iii) Outline strategies that could be implemented to achieve high levels of data integrity for this system. 4
- (c) Compare and contrast batch and real-time transaction processing. Include examples in your answer. 5

End of Question 25

Question 26 — Decision Support Systems (20 marks)

Use a SEPARATE writing booklet.

- (a) A sports expert system considers the results of a series of actions (eg running up stairs, throwing a ball) and suggests a sport a person should participate in.
- (i) Describe TWO of four main parts that make up an expert system, and give an example of the information held by each part from the sports expert system. **4**
 - (ii) Critically evaluate the choice of an expert system rather than a neural network for this situation. **4**
- (b) Compare situations in which structured and unstructured decisions are made. Give one example of each. **4**
- (c) A school needs to increase some of its school and subject fees to ensure that all its costs are covered (eg repairs and maintenance, telephone costs, stationery, library and teaching resources). To help it make decisions the school needs a spreadsheet that allows it to explore different scenarios. **8**

Explain how the spreadsheet should be designed and used to explore alternatives. Use a diagram in your explanation.

Question 27 — Automated Manufacturing Systems (20 marks)

Use a SEPARATE writing booklet.

- (a) The sorting of conventional mail (letters, parcels, etc.) has become automated over time. Mail is collected from mail boxes, taken to a mail centre and then sorted for distribution.
- (i) What are TWO issues arising from the introduction of automatic mail sorting? 2
 - (ii) Describe the data collection and data processing technologies that may be used within the sorting system. Use a diagram to illustrate where these technologies fit in the system. 5
- (b) Many cars are fitted with an automatic cruise control, which keeps the car at a steady speed even when going up or down hills.
- (i) Draw a block diagram of the cruise control system, showing the flow of data within the system, and the sensors required. Describe the operation of ONE of the sensors. 3
 - (ii) Describe, with the aid of a diagram, the effect of underdamping in such a system. 2
- (c) Giant Strides, a clothing retail chain, is equipping its stores with an option called Personal Pair. This option allows customers to design jeans to their own specifications. The specifications are entered into a personal computer at the store. The information is then sent over a network to a factory where the jeans are made.
- (i) Draw a data flow diagram to represent the movement of data between the stores and the factory. 3
 - (ii) Describe the information technologies that make the Personal Pair system possible for Giant Strides, and explain the advantages of this approach for the manufacturer. 5

Question 28 — Multimedia Systems (20 marks)

Use a SEPARATE writing booklet.

- (a) Multimedia systems are often used for leisure and entertainment.
- (i) Describe the information technologies that could be used to develop a multimedia computer game on a CD-ROM. **3**
 - (ii) Suggest TWO suitable criteria to evaluate the product. **2**
- (b) The merging of radio, television, communications and the Internet has increased with improvements in the process of digitisation. Internet television is a product of these developments. Internet television allows for an interactive mode not possible with traditional television broadcasting.
- (i) What is meant by digitising, and how is this process achieved? **3**
 - (ii) Explain what is meant by the term *interactive* in this context, and explain how it might benefit both the television station and the viewers. **4**
- (c) A small team of students is working on a multimedia project about their local area. It will be displayed in a tourist information centre. Some students in the team want to make their project in a linear layout using presentation software incorporating photography. Other members of the team prefer to use a non-linear layout and incorporate a recently purchased video of local sights. **8**

Compare the two approaches in terms of technical and ethical factors that need to be considered for the inclusion of photographs or videos. Evaluate these two approaches, considering their likely impact on the final users of this project.

End of paper