

2024 HSC

Information Processes and Technology

Marking Guidelines

Section I

Multiple-choice Answer Key

Question	Answer
1	A
2	B
3	A
4	B
5	D
6	C
7	B
8	C
9	A
10	A
11	D
12	D
13	C
14	B
15	C
16	B
17	A
18	B
19	D
20	C

Section II

Question 21 (a)

Criteria	Marks
<ul style="list-style-type: none"> • Outlines ONE appropriate action that the project manager could take to minimise communication issues 	2
<ul style="list-style-type: none"> • Provides some relevant information 	1

Sample answer:

The project leader can use relevant team-building activities such as a working lunch, so the team members work more effectively as a team.

Question 21 (b)

Criteria	Marks
<ul style="list-style-type: none"> • Provides an explanation of how a Gantt chart can be used throughout the development of this system 	3
<ul style="list-style-type: none"> • Describes the use of a Gantt chart 	2
<ul style="list-style-type: none"> • Provides some relevant information 	1

Sample answer:

Given the significant number of tasks to be completed in this project (such as interface design, user's travel history, selection of destinations for a user), the project manager uses the Gantt chart to allocate tasks to available team members with relevant skills, estimate overall times required and assist the project manager to respond appropriately to issues through the project as they arise. Tasks that take longer than expected will shift the milestones of dependent tasks potentially affecting the final deadlines.

The Gantt chart provides an overview of tasks against a timeline to enable deadlines to be met. It may be necessary to re-allocate tasks to other team members with the required skill to meet the deadlines.

Question 21 (c)

Criteria	Marks
<ul style="list-style-type: none"> • Outlines ONE ethical issue relevant to this system 	2
<ul style="list-style-type: none"> • Provides some relevant information 	1

Sample answer:

Users of the new system may have their privacy invaded if the system acquires past travel history. Users may not want others to know where they have visited in the past or on what specific dates.

Question 21 (d)

Criteria	Marks
• Proposes and justifies a relevant conversion method for this system	3
• Demonstrates some understanding of a relevant conversion method	2
• Provides some relevant information	1

Sample answer:

A small group of users can be selected to run the pilot software to ensure that all parts of the system work as expected, including the interfaces. To ensure that all parts of the system are tested, this pilot group should include use of a range of internet browsers.

A pilot conversion method is proposed because the impact of an issue with the system will be significant once it is widely installed.

Question 22 (a)

Criteria	Marks
• Outlines some benefits of developing a prototype	3
• Identifies some benefits of developing a prototype OR • Outlines a benefit of developing a prototype	2
• Provides some relevant information	1

Sample answer:

Developing a prototype allows the developer to effectively communicate the design to the organisers. The developers can also use the prototype to get feedback which can help refine the design to meet the needs of the organisers and the users. The developer can use the prototype to test their ideas and concepts prior to implementing the web page.

Question 22 (b)

Criteria	Marks
• Provides a labelled screen layout that minimises errors in data entry	3
• Provides a screen layout showing some understanding of how to minimise errors	2
• Provides some relevant information	1

Sample answer:

Film Event Screening Association

Please enter your details, including first name, last name and email address

Full name

Email

Film title 1

Film title 2

Film 1 thumbnail Film 2 thumbnail Film 3 thumbnail Film 4 thumbnail

You have selected Film 1 and Film 3.
Please confirm these choices, or press back to make changes

Confirms format of email address

Dropdown replacing freeform text field with valid options only

Confirmation Dialog to ensure validity of selections

Question 22 (c)

Criteria	Marks
<ul style="list-style-type: none"> Recommends appropriate security measures to prevent the tampering of voting results 	4
<ul style="list-style-type: none"> Outlines some appropriate security measures and provides some justification 	3
<ul style="list-style-type: none"> Outlines ONE relevant security measure OR <ul style="list-style-type: none"> Identifies some relevant security measures 	2
<ul style="list-style-type: none"> Provides some relevant information 	1

Sample answer:

Secure internet technology (eg HTTPS) should be used to send data from the browser to the database.

Data should be encrypted before it is stored in the database and not stored as plain text. The encryption/decryption algorithm or keys should only be known to the developer and database administrator who worked on that part of the code.

All authorised users should be set up with two-factor authentication using their mobile phone or external device.

Answers could include:

- Firewall
- Virtual private network (VPN).

Question 23 (a)

Criteria	Marks
<ul style="list-style-type: none"> Describes ONE social and ONE ethical issue associated with the use of the systems 	3
<ul style="list-style-type: none"> Describes ONE issue (social or ethical) and identifies another 	2
<ul style="list-style-type: none"> Provides some relevant information 	1

Sample answer:

Privacy

Owners could be concerned about the council knowing the whereabouts of their pets. The data can be used by vets and council to monitor who the pet belongs to.

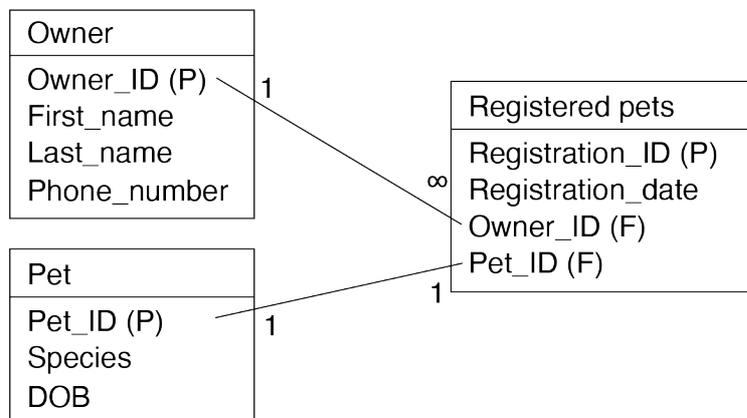
Accuracy

If a pet is found and taken to the vet, it could be seen to be uncared for and the data can be used to locate and possibly penalise the owner.

Question 23 (b)

Criteria	Marks
<ul style="list-style-type: none"> Provides a correct schema for this system Includes relevant fields labels, primary keys, foreign keys and relationships 	5
<ul style="list-style-type: none"> Provides a substantially correct schema for this system 	4
<ul style="list-style-type: none"> Provides a schema that shows some understanding of the organisation of the data 	3
<ul style="list-style-type: none"> Correctly identifies some fields 	2
<ul style="list-style-type: none"> Provides some relevant information 	1

Sample answer:

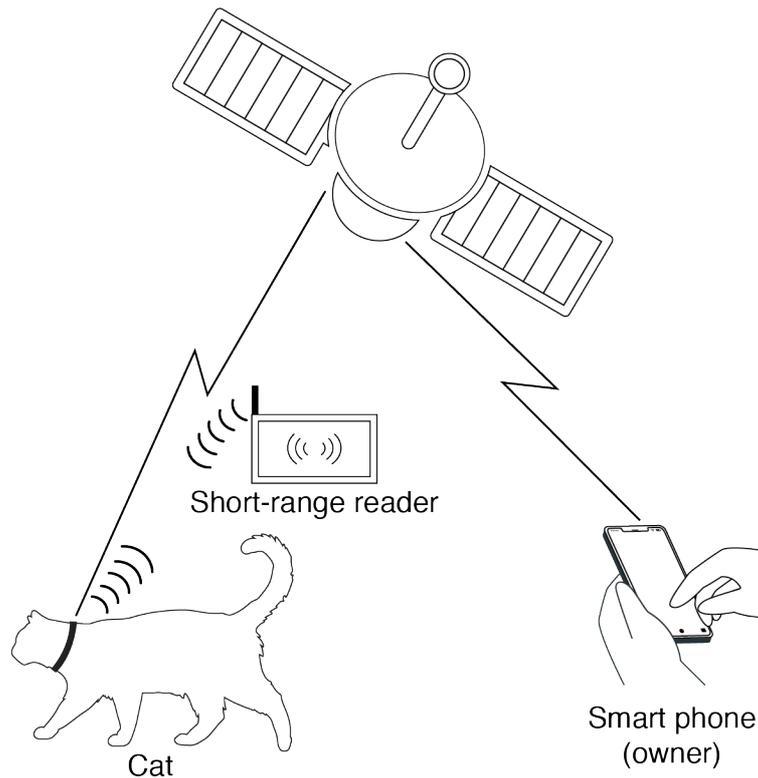


P = Primary key F = Foreign key

Question 23 (c)

Criteria	Marks
<ul style="list-style-type: none"> Constructs a substantially correct network diagram to represent the pet tracking technologies 	3
<ul style="list-style-type: none"> Constructs a mostly correct network diagram to represent the pet tracking technologies 	2
<ul style="list-style-type: none"> Provides some relevant information 	1

Sample answer:



Question 24 (a)

Criteria	Marks
<ul style="list-style-type: none"> Outlines TWO tasks undertaken by a network administrator for this company 	2
<ul style="list-style-type: none"> Provides some relevant information 	1

Sample answer:

The network administrator devises appropriate backup procedures for this global network. They also determine access rights for team members and business partners.

Question 24 (b)

Criteria	Marks
• Describes TWO application-level protocols relevant to this global network	3
• Outlines an application-level protocol	2
• Provides some relevant information	1

Sample answer:

HTTP is an application-level protocol that regulates data communication on the World Wide Web. It facilitates worldwide connectivity by offering a standardised mechanism for transmitting various media types between web browsers and servers.

SMTP is essential for facilitating email communication. As the company develops its activities worldwide, SMTP guarantees global connectivity by using standard protocols for transmitting and receiving electronic mail.

Question 24 (c)

Criteria	Marks
• Explains how appropriate hardware can affect the performance AND reliability of a global network used for communication	4
• Describes how hardware can affect the performance OR reliability of a global network used for communication	3
• Outlines how performance OR reliability can impact a communication system	2
• Shows some understanding of communication over a network	1

Sample answer:

The users of this global network would need seamless transmission of audio and video data for video conferencing. To achieve this, a high-bandwidth communications medium and servers with high capacity and fast access speeds are required. If this is not adequate, the performance of the global network can have a big impact on how effectively people can communicate.

Appropriate hardware, like routers and switches, need to be configured to maximise data transfer speeds to minimise delays in transmission. The network design needs to be expandable to facilitate future growth of the company. Better communication is made possible by an infrastructure that is scalable to handle more devices and increasing data traffic.

It's also important that the network is reliable, since failing devices can cause communication problems. It may be necessary to incorporate redundant hardware to ensure uninterrupted connections.

Section III

Question 25 (a)

Criteria	Marks
• Describes data integrity with a relevant example	3
• Outlines factors relating to data integrity	2
• Provides some relevant information	1

Sample answer:

Data integrity refers to the accuracy and reliability of information within an information system. This includes measures to prevent and detect errors, corruption, or unauthorised modifications, maintaining the quality and reliability of data. An example could be the removal of obsolete data from a database such as customers from an online shopping database who have not made a purchase in the last 10 years.

Question 25 (b)

Criteria	Marks
• Explains why a rollback process is important	3
• Describes some features of rollback	2
• Identifies a feature of backup or recovery	1

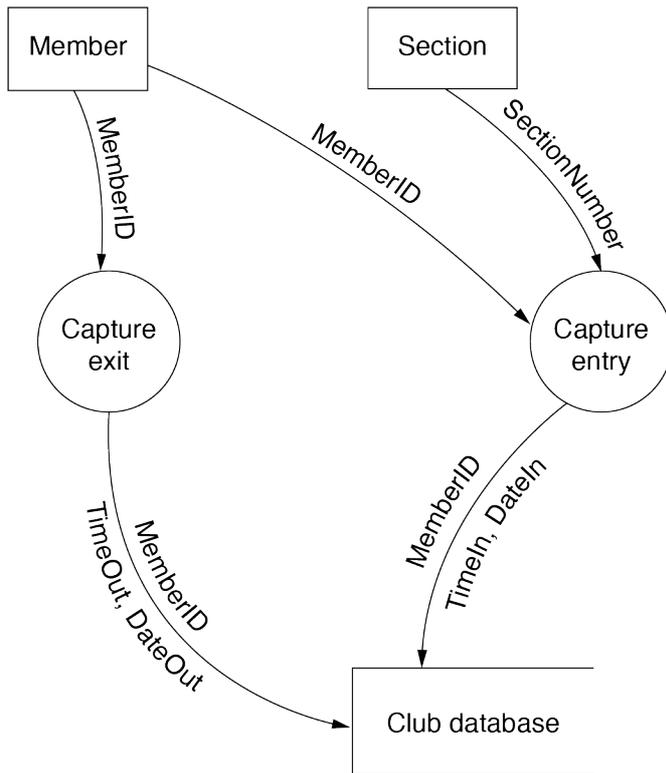
Sample answer:

In the event of a problem such as a system crash or inappropriate transactions, the database can become corrupt. Rollback undoes changes from transactions since the last stable state of this system. This brings the system back to a stable state so that valid transactions can be reapplied and processed appropriately.

Question 25 (c) (i)

Criteria	Marks
• Draws a substantially correct data flow diagram related to the scenario	4
• Draws a partially correct data flow diagram related to the scenario	3
• Produces a diagram with some relevant symbols	2
• Provides some relevant information	1

Sample answer:



Question 25 (c) (ii)

Criteria	Marks
• Provides a substantially correct report layout for this system with sections labelled	4
• Provides a report layout for this system with some relevant sections	3
• Identifies some features of a report	2
• Provides some relevant information	1

Sample answer:

Usage by section			
Club graphic →	Your Club	Attendance Report	← Report header
Section No 6	Date	Attendance	TimeSlots ← Page header
	16/02/2023	150	7-8
	16/02/2023	50	8-9
Detail section showing daily attendance for each section →	16/02/2023	180	9-10 ← Calculation
	16/02/2023	100	10-11
	16/02/2023	220	11-12
	16/02/2023	40	12-1pm
	16/02/2023	170	1-2pm
	Average Total	130	910 ← Report footer with aggregated totals
			Page 6 ← Page footer

Question 25 (d)

Criteria	Marks
<ul style="list-style-type: none"> Explains the process of data mining in banking to detect fraud with reference to analysing AND retrieving 	6
<ul style="list-style-type: none"> Describes data mining in banking with reference to analysing AND retrieving 	5
<ul style="list-style-type: none"> Describes data mining in banking with reference to analysing OR retrieving 	4
<ul style="list-style-type: none"> Outlines features of data mining with reference to analysing OR retrieving 	2–3
<ul style="list-style-type: none"> Provides some relevant information 	1

Sample answer:

Data mining is the use of software to analyse large databases to discover patterns and trends. Data mining software is essential for quickly identifying trends that could indicate possible fraud.

Data mining retrieves historical data to analyse when and where money was spent. It should be possible to identify any unexpected or unusual transactions. These models use historical data to identify trends linked to fraudulent behaviour. If a current transaction demonstrates this recognised trend, it may signal potential fraudulent action.

By retrieving information from multiple sources, a more comprehensive profile of client behaviour is possible. These sources include dates and locations of transactions and external databases such as international calendars and economic data. By adopting this approach, the accuracy of fraud detection is improved since it considers a wider range of elements and relationships.

Question 26 (a)

Criteria	Marks
<ul style="list-style-type: none"> Discusses the use of a GDSS to manage scheduled meetings for solving unstructured problems, providing advantages AND/OR disadvantages 	3
<ul style="list-style-type: none"> Provides an advantage OR a disadvantage of the use of a GDSS in managing meetings 	2
<ul style="list-style-type: none"> Provides some relevant information 	1

Sample answer:

A GDSS allows all team members using technology to have their views heard and acknowledged regardless of their physical location. A GDSS ensures more vocal attendees do not dominate the decision-making process.

On the other hand, use of a GDSS requires a significant investment in appropriate technology that should be upgraded regularly. The technology must provide fast access to video and voice data with rapid, seamless sharing of screens and files. The costs of failure with disruption to meetings can be significant.

Question 26 (b) (i)

Criteria	Marks
<ul style="list-style-type: none"> Provides a correct formula 	2
<ul style="list-style-type: none"> Provides some relevant information 	1

Sample answer:

= IF (D2 > 200, "*", "")

Question 26 (b) (ii)

Criteria	Marks
• Identifies the <i>analysis</i> process and provides an explanation for the use of a pivot table in decision making using the example shown	5
• Identifies the <i>analysis</i> process and describes the use of the pivot table shown in decision making	4
• Describes the use of a pivot table in decision making	3
• Outlines the use of a spreadsheet in decision making	2
• Provides some relevant information	1

Sample answer:

The use of a pivot table is associated with the information process analysing.

It is useful for decision making based on the data stored in the worksheet, as it can quickly present the data from a variety of perspectives. It can interactively group different categories and produce totals for each of these, presenting the data in a way that makes it much easier to see the relationships inherent in the data. These different views of the data can often show trends that are not immediately visible in the originally entered data, allowing for more informed decision making.

For example, in pivot table 2, it is immediately obvious that the sales in October are the highest in that quarter, and that Matt has sold the most overall. This cannot be easily seen in the original worksheet or in pivot table 1.

Question 26 (c)

Criteria	Marks
• Explains the role of the knowledge engineer using the provided diagram	4
• Describes the role of a knowledge engineer with reference to the diagram	3
• Outlines the role of a knowledge engineer in designing an expert system	2
• Provides some relevant information	1

Sample answer:

The knowledge engineer has the job of eliciting the knowledge of the content area from an expert in the field. They collate that information into a coherent set of facts and rules and cover the content area, ensuring that there are no gaps or inconsistencies. The software allows the knowledge engineer to effectively create the knowledge base through encoding these facts and rules using the required syntax of the expert system software.

The knowledge engineer assists in the formatting and layout of the explanation facility so that the explanation module can produce a display for the user. This allows users to see the 'logic' followed by the expert system inference engine in arriving at its goal. The knowledge engineer assists in the wording, formatting and design of the various interfaces presented to the non-expert user by the inference engine, as it discards irrelevant rules, selects and asks the next in a series of questions for the user to arrive at a goal.

Question 26 (d)

Criteria	Marks
• Explains a range of issues that may arise from using a neural network for this system	6
• Describes issues that may arise from using a neural network for this system	5
• Outlines potential issues with the use of a neural network	3–4
• Demonstrates some understanding of this system	2
• Provides some relevant information	1

Sample answer:

If the system is not shown sufficient images by a particular artist, or images which are not representative of their original style, the system may not accurately or consistently 'recognise' other works by the same artist.

When capturing the images used in the training process, it is critical that the images stored by the neural network are an accurate representation of the work. This may be difficult, for example, for highly textured or very large wall-size paintings.

For a new up-and-coming artist, they may not have a sufficient portfolio of representative artworks yet. It is important that the neural network be retrained as more artists and more works become available.

It is important that this neural network system be used only for its intended purpose. It should not be used, for example, by artists claiming copyright over others' work.

Who takes responsibility for financial loss if the neural network produces an incorrect answer and an art collector purchases an artwork thinking it is an original for a high price?

Question 27 (a)

Criteria	Marks
• Distinguishes between continuous and batch processes, providing an example of each	3
• Outlines the difference between continuous and batch processes	2
• Identifies a feature of continuous or batch processes	1

Sample answer:

Continuous processes constantly runs the same process and whilst it receives feedback to adapt functioning, it has no set starting or finishing point. An example of a continuous process is air-conditioning units.

Batch processes perform different or modified production runs and have set starting and finishing points. An example of a batch process can include creation of fashion clothes in different sizes.

Question 27 (b)

Criteria	Marks
• Describes how critical damping can overcome the boom gate issue	3
• Outlines the effects of damping when applied to a boom gate	2
• Provides some relevant information	1

Sample answer:

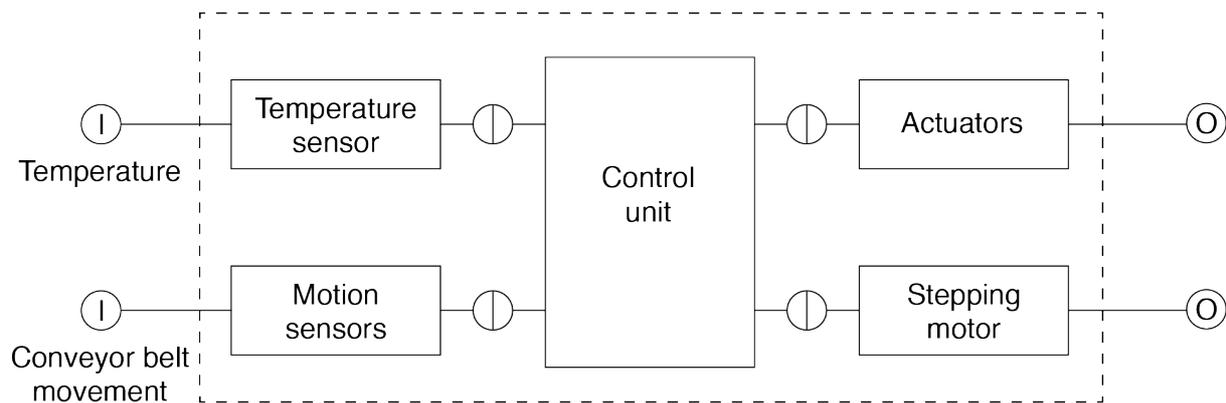
The boom gate in the car park has underdamping which is a quick response to change leading to rapid fluctuations. Adjusting the damping to critical damping is a quick response to a change in the system with a quick return to stability. Critical damping will stop the boom gate closing too quickly and allow the system to return to its normal state safely, removing the hazard to people or vehicles nearby.

Question 27 (c) (i)

Criteria	Marks
<ul style="list-style-type: none"> Explains the operation of the doughnut machine system Provides a correctly labelled block diagram 	5
<ul style="list-style-type: none"> Describes the operation of the doughnut machine Produces a block diagram for this system 	3–4
<ul style="list-style-type: none"> Outlines the operation of the system including a sensor and an actuator 	2
<ul style="list-style-type: none"> Provides some relevant information 	1

Sample answer:

When the controller receives a request for the doughnut machine to produce items, the temperature sensors are activated. This information is acted upon by the control unit that sends instructions to the motors/robotic hand/actuators. The block diagram shows the relationship between the temperature being correct for cooking and the actuators directing the movement of the robotic arm to flip the doughnuts and to move the production of doughnuts along the conveyor belt. The higher the temperature the faster the doughnuts must move through the machine.



Answers could include:

An image/colour/visual sensor that can detect the colour of the doughnut indicating it has been cooked too long.

Question 27 (c) (ii)

Criteria	Marks
<ul style="list-style-type: none"> • Explains how the doughnut system ensures the production of a quality output 	3
<ul style="list-style-type: none"> • Describes how quality control is enabled for this system with reference to sensors AND/OR control unit AND/OR actuators 	2
<ul style="list-style-type: none"> • Provides some relevant information 	1

Sample answer:

Quality control will be ensured through sensors such as a temperature sensor ensuring the oil is the correct heat and a visual sensor to ensure that the doughnuts are not undercooked or burnt. The doughnut machine is dependent on the physical operation of the machine being timed accurately to ensure that processes occur appropriately for the best product.

Physical operation of the doughnut machine will include actuators under the instruction of a control unit which moves a robotic hand and/or assembly line. The control unit is critical for ensuring all the components operate together seamlessly. If the sensors indicate something unusual, the control unit will send a relevant output to the actuators to remedy the situation.

Question 27 (d)

Criteria	Marks
• Explains how sensors and actuators can be used in an automated irrigation system to maximise production and minimise cost	6
• Describes how sensors and actuators can be used in an automated irrigation system	5
• Describes the use of a sensor and an actuator that can be used in an automated irrigation system	4
• Outlines features of a sensor AND/OR an actuator that can be used in an automated irrigation system	3
• Outlines features of a sensor or an actuator	2
• Identifies a feature of automated systems	1

Sample answer:

This system can use sensors such as ultrasonic, temperature, soil moisture and soil quality to collect data.

The system can be connected to a weather monitoring station to collect data regarding rain, wind and temperature. This system monitors water in the soil and growth of the plant and this, together with the weather data, tells it how much water to release. Soil moisture has many variables which can affect it, including the weather such as when the last time it rained or if it is a period of drought.

The soil moisture sensor needs to be accurate and collect data frequently to ensure that the irrigation system is only used when the soil is dry and inadequate for the crop that is being grown. Different crops may have different requirements based on their ideal growing conditions and soil quality. Ensuring the water characteristics and soil quality are met will ensure a crop grows quickly and the yield is maximised. By removing the need for manual labour, this system can reduce costs further.

Actuators such as motors are used by the system to turn the hydraulic water pumps on and off. The water tank needs to ensure it has constant supply of water and needs ultrasonic and flow sensors to activate refilling of the water pump to ensure a constant supply.

An advanced automated irrigation system may have pressure sensors for monitoring faults in the watering system itself and may use moisture sensors to detect that the water is evenly distributed.

Question 28 (a)

Criteria	Marks
• Describes a valid audio compression technique including a relevant file type	3
• Outlines a relevant compression technique	2
• Provides some relevant information	1

Sample answer:

MP3 is an example of an audio compressed CODEC which removes the frequencies that are outside the human hearing range. This serves to maintain quality of the sound file while significantly reducing file size.

Question 28 (b)

Criteria	Marks
• Outlines features of animation multimedia files that contribute to file size	3
• Identifies features of animation multimedia files	2
• Provides some relevant information	1

Sample answer:

Animation multimedia files comprise visual and audio components. The size of the visual components is affected by bit depth, frame rate, duration and resolution, which will affect the size of individual frames as well as the overall file size. The audio component is affected by bit depth and sample rate.

Question 28 (c)

Criteria	Marks
• Describes hardware requirements for editing uncompressed video	4
• Outlines some hardware requirements for editing video	3
• Identifies a hardware requirement(s) for editing video	2
• Provides some relevant information	1

Sample answer:

Uncompressed video files contain a huge number of individual frames. A powerful central processing unit (CPU) is essential to provide faster clock speeds and capacity for carrying out millions of instructions per second. This would ensure a seamless process in editing the uncompressed video. Ideally, a high-capacity GPU (graphics processing unit) could render the uncompressed video clips in less time. Substantial RAM capacity is also a factor in improved response times and would ensure seamless multitasking between various software applications required. Increased bus speed on the motherboard would enable higher data throughput between the various components. A solid state drive (SSD) storage device would reduce buffering and allow better access speeds.

Question 28 (d) (i)

Criteria	Marks
• Explains the roles required to develop this multimedia system	4
• Describes a role(s) required to develop this multimedia system	3
• Outlines a relevant role	2
• Provides some relevant information	1

Sample answer:

This system contains a range of multimedia apps that span printed and digital media. Specialists in graphic design would be required to arrange the images to ensure maximum resolution and clarity to reflect the true nature of the plant. Creativity is also required to make the design appealing and the content easily legible.

Since the system contains voice activation and audio playback, an audio editor would be required to edit the sound clips and may use multi-track editing to include fading, background music and sounds for interactivity and engagement.

A content provider would ensure the appropriate information about plants is added to the multimedia system. If the content is more appropriate for the target audience, the product will be more appealing.

Answers could include:

- A database administrator would also be required to organise the images in a linked online database to the companion application. They would incorporate login credentials that are hardcoded onto the printed cards to enable access to the online image library.
- Technical support for the development team, including network access and file conversions, and media editing specialists to create and edit relevant sound clips, images and animations.

Question 28 (d) (ii)

Criteria	Marks
• Explains the relationships between the needs of the users, the features of this multimedia system and the <i>displaying</i> and <i>collecting</i> processes	6
• Describes the features of this multimedia system demonstrating an understanding of <i>displaying</i> and <i>collecting</i>	5
• Describes a feature of this multimedia system relative to the needs of the users with some reference to <i>displaying</i> and <i>collecting</i>	4
• Outlines a feature of this multimedia system with some reference to <i>displaying</i> AND/OR <i>collecting</i>	2–3
• Provides some relevant information	1

Sample answer:

This educational system requires the relevant app to have the microphone and camera enabled to capture required data such as voice commands or tap and swipe functions. A child who has difficulty reading could navigate the system easily by scanning the provided QR code (collecting) and listening to the narrated text (displaying). A vision-impaired student could use the voice activation feature (collecting) as described to navigate the system (displaying). The voice activation feature could be useful for people with low literacy or vision impairment.

The 'pop up' feature activated by the QR code adds visual appeal which is likely to trigger the curiosity of the child and compel them to continue exploring. Using a device with a larger screen size will enhance image clarity (displaying) and result in a more immersive experience for a young reader and those with visual impairments.

The next and previous buttons would reduce the need to scan the next QR codes on the cards. This reduced reliance on the camera app would improve navigation and make the system more intuitive and therefore more accessible.

The combined tactile experience of the physical cards and touch screen could engage children who are easily distracted.

2024 HSC Information Processes and Technology Mapping Grid

Section I

Question	Marks	Content	Syllabus outcomes
1	1	9.3 Cable types	H1.1
2	1	9.1 Testing data	H6.2
3	1	9.3 Data type	H1.1
4	1	9.3 E-crime	H3.2
5	1	9.1 Feasibility study	H6.2
6	1	9.1 Context diagram	H7.2
7	1	9.2 Metadata	H1.1
8	1	9.1 Training	H6.2
9	1	9.3 Client-server	H1.1
10	1	9.1 Requirements report	H6.2
11	1	9.2 File encryption	H3.2
12	1	9.2 Database sorting	H1.1
13	1	9.2 Database	H2.2
14	1	9.3 Comms hardware components	H1.1
15	1	9.2 SQL	H1.1
16	1	9.1 Development approach	H6.2
17	1	9.2 Information processes	H1.2
18	1	9.2 Systems documentation	H7.2
19	1	9.3 Protocols	H1.1
20	1	9.3 Communication layers	H1.1

Section II

Question	Marks	Content	Syllabus outcomes
21 (a)	2	9.1 Conflict resolution	H7.1
21 (b)	3	9.1 Use of Gantt charts	H7.1
21 (c)	2	9.1 Ethical Issues	H3.2
21 (d)	3	9.1 Implementation methods	H6.2
22 (a)	3	9.1 Prototype	H6.2
22 (b)	3	9.2 Screen design	H6.2
22 (c)	4	9.2 Data security	H3.1
23 (a)	3	9.2 Social and ethical issues	H3.1
23 (b)	5	9.2 Database schema	H1.1, H2.2
23 (c)	3	9.3 Network diagram	H1.1

Question	Marks	Content	Syllabus outcomes
24 (a)	2	9.3 Roles of network administrator	H7.1
24 (b)	3	9.3 Communications protocols	H1.1
24 (c)	4	9.3 Performance and reliability of a network	H3.1, H4.1

Section III

Question	Marks	Content	Syllabus outcomes
25 (a)	3	9.4.1 Data integrity	H3.1
25 (b)	3	9.4.1 Rollback	H1.1
25 (c) (i)	4	9.4.1 DFD carpark booking system	H7.2
25 (c) (ii)	4	9.4.1 Report layout	H2.2
25 (d)	6	9.4.1 Data mining 9.4.1 Receiving/analysing	H2.2
26 (a)	3	9.4.2 GDSS	H1.1, H3.1
26 (b) (i)	2	9.4.2 Spreadsheet formula	H1.1
26 (b) (ii)	5	9.4.2 Spreadsheet – pivot table	H1.1
26 (c)	4	9.4.2 Expert system – knowledge engineer	H1.1, H3.1
26 (d)	6	9.4.2 Neural networks	H2.2, H4.1
27 (a)	3	9.4.3 Distinguish between continuous or batch	H1.1
27 (b)	3	9.4.3 Types of damping – under, over and critical	H1.1
27 (c) (i)	5	9.4.3 Explanation of an automated system	H2.2
27 (c) (ii)	3	9.4.3 Quality control in a sensor-based system	H1.1, H3.1, H6.1
27 (d)	6	9.4.3 Automated system design	H6.1
28 (a)	3	9.4.4 Compression techniques – audio	H1.1
28 (b)	3	9.4.4 Storage requirements	H1.1
28 (c)	4	9.4.4 Hardware demands on multimedia	H1.1
28 (d) (i)	4	9.4.4 Specialist roles	H5.1
28 (d) (ii)	6	9.4.4 Multimedia features	H3.1, H6.1