# 2013 HSC Information Processes and Technology Marking Guidelines

## Section I

**Multiple-choice Answer Key**

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

# Section II

## Question 21 (a)

| Criteria | Marks |
|---|---|
| • Demonstrates an understanding of a method that could be used to provide different employees with different levels of access to the documents | 2 |
| • Identifies a feature of allowing different levels of access | 1 |

*Sample answer:*

Login username and password: users are allocated into groups with set permissions (security). These permissions grant access based on security rules that are set by the system administrator.

## Question 21 (b)

| Criteria | Marks |
|---|---|
| • Provides similarities and/or differences between the use of printed user manuals and the provision of face-to-face training classes in order to prepare employees for the introduction of the new system, demonstrating a clear understanding of the scenario | 3 |
| • Demonstrates some understanding of the use of printed user manuals and/or providing face-to-face training classes | 2 |
| • Identifies a feature of a printed user manual or face-to-face training classes | 1 |

*Sample answer:*

Given that the employees are not comfortable with information technology, a more personal approach to training is provided in the face-to-face training classes. This forum gives employees a chance to ask any questions relating to their specific roles and practise using the information technology under the guidance of an instructor.

A printed user manual is different to face-to-face training classes as it provides the opportunity for employees to travel at their own pace, as there is no time limit imposed. However, their unfamiliarity with the technology would mean that they might not persist when they encounter problems.

***Answers could include:***

| Training methods | Similarities | Differences |
|---|---|---|
| – Printed user manual<br>– Face-to-face training classes | – Employees learn how to use the system<br>– Both detail information related to jobs/uses<br>– Both methods explain the changes to the employees | – Manuals will contain information that may not be relevant to all employees<br>– Manuals are technical and contain much information which may not be understood by all employees<br>– Training classes are face-to-face and allow for a constructive relationship between the employees and trainers enabling employees to become comfortable with the changes to the legal firm<br>– Training classes give employees the opportunity to ask questions relevant to their needs<br>– Training classes enable trainers to ease employees into the changes and using the new system |

**Question 21 (c)**

| Criteria | Marks |
|---|---|
| • Describes technologies demonstrating an understanding of document sharing and communication within the scenario | 3 |
| • Outlines technologies demonstrating an understanding of document sharing AND/OR communication | 2 |
| • Identifies a characteristic/feature of a suitable technology | 1 |

*Sample answer:*

Due to the different locations of employees that are still expected to work together simultaneously, a range of technologies is required. These could include portable laptops with built in cameras and chat software, to allow employees to view each other and discuss the documents. A microphone and a headset would also be required to help them discuss the project effectively. With documents being saved to an online central server in a database, FTP software is required to upload and download files. Editing software, such as a word processor or even graphics software may be used to manipulate the documents. A high-speed internet connection is required in order to maintain a good quality image, sound and file transfers.

**Question 22 (a)**

| Criteria | Marks |
|---|---|
| • Describes the information process of collecting demonstrating a clear understanding of the scenario | 3 |
| • Describes the information process of collecting demonstrating some understanding of the scenario | 2 |
| • Identifies a feature of collecting | 1 |

*Sample answer:*

The registration process would require commuters to provide their account, personal and contact details. This would be collected using an online or electronic form provided on either a Mobile App or traditional computer. A customer's order details would also be collected using the Mobile App when the user selects their choice on the provided menu.

The travelling customer's location would be detected by the Mobile App so that navigation instructions could be accurately calculated. Each participating coffee house would also provide their permanent location to enable customers to navigate successfully to the store. The collecting of each coffee house's account details would ensure the coffee house receives payment for the orders they fill from each travelling customer.

**Question 22 (b)**

| Criteria | Marks |
|---|---|
| • Describes TWO different software applications used in the information system | 3 |
| • Identifies TWO relevant software applications<br>OR<br>• Provides description of a relevant software application | 2 |
| • Identifies a relevant software application | 1 |

*Sample answer:*

An online database that captures orders would be used. The date and time data would also determine the sequence in which orders would need to be filled. This database would also contain details of customers when they register, enabling an email and/or SMS to be sent to confirm an order, purchase and send a receipt. The receipt could also be bar-coded so that it could be shown and scanned at the collection window to ensure the correct order is handed to the customer.

The Mobile App would include the facility to make an order using either a 3G or wi-fi network. A confirmation message would be received from the website when an order has been successfully placed, including the receipt with the barcode. The barcode would then be displayed on the mobile screen to facilitate scanning at the collection window.

*Answers could include:*

Database        – ordering and storing details of the transaction

Communications  – connecting the customer to the website online – web browsers

App             – for ordering via mobile devices

GPS/GIS         – to locate nearest store or stores along the intended route

**Question 22 (c)**

| Criteria | Marks |
|---|---|
| • Identifies hardware components and explains how they would ensure uninterrupted availability of the system during periods of high demand | 3 |
| • Identifies a hardware component and explains how it can ensure the uninterrupted availability of the system during periods of high demand<br>OR<br>• Identifies hardware components relevant to the scenario | 2 |
| • Identifies a relevant hardware component | 1 |

*Sample answer:*

Technology considerations could include placing additional servers and data storage on the host. Negotiating an increase in bandwidth with the internet provider would also ensure data traffic can flow smoothly through the system and that there is minimal delay in orders arriving at the nearby café. Optic fibre cabling could also facilitate speed of data transmission. As a backup measure, fat clients could exist at the participating cafes to ensure continued operation if one or more servers become unavailable.

*Answers could include:*

The systems analyst would need to ensure connection to the online café could cope with mornings, afternoons and weekends where demand of café-style drinks is much higher than at other times.

• mirror site, hardware to backup data and software

• 3G wireless backup

• redundancy broadband/optic fibre

• UPS

• RAID

• switches and nodes

**Question 23 (a)**

| Criteria | Marks |
|---|---|
| • A correct Gantt chart that shows the minimum time required | 3 |
| • Gantt chart with some correct features | 2 |
| • Identifies a feature of a Gantt chart | 1 |

*Sample answer:*
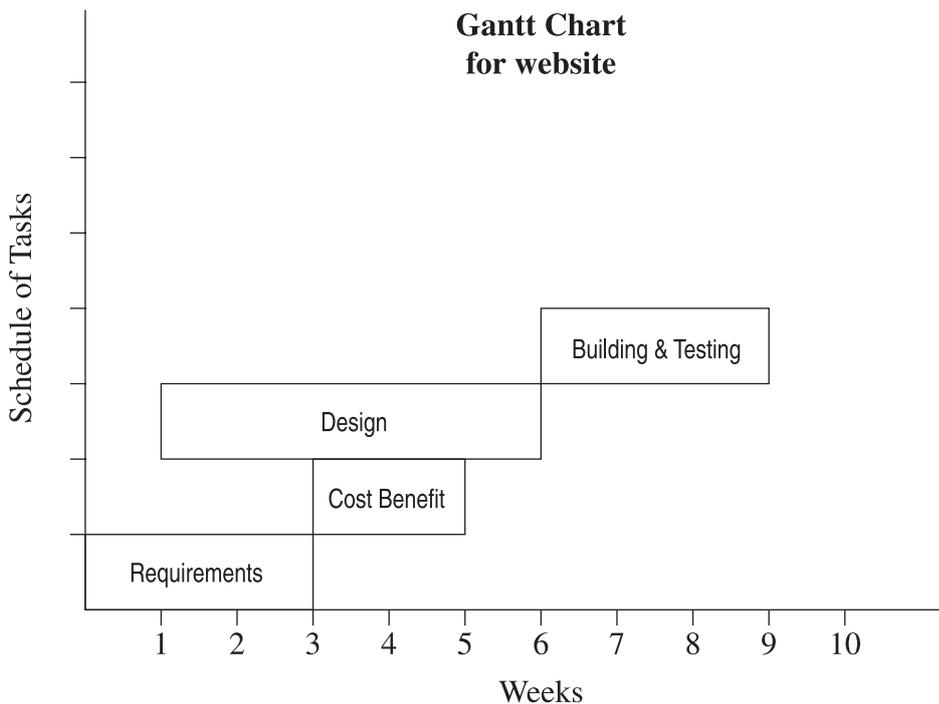


**Question 23 (b)**

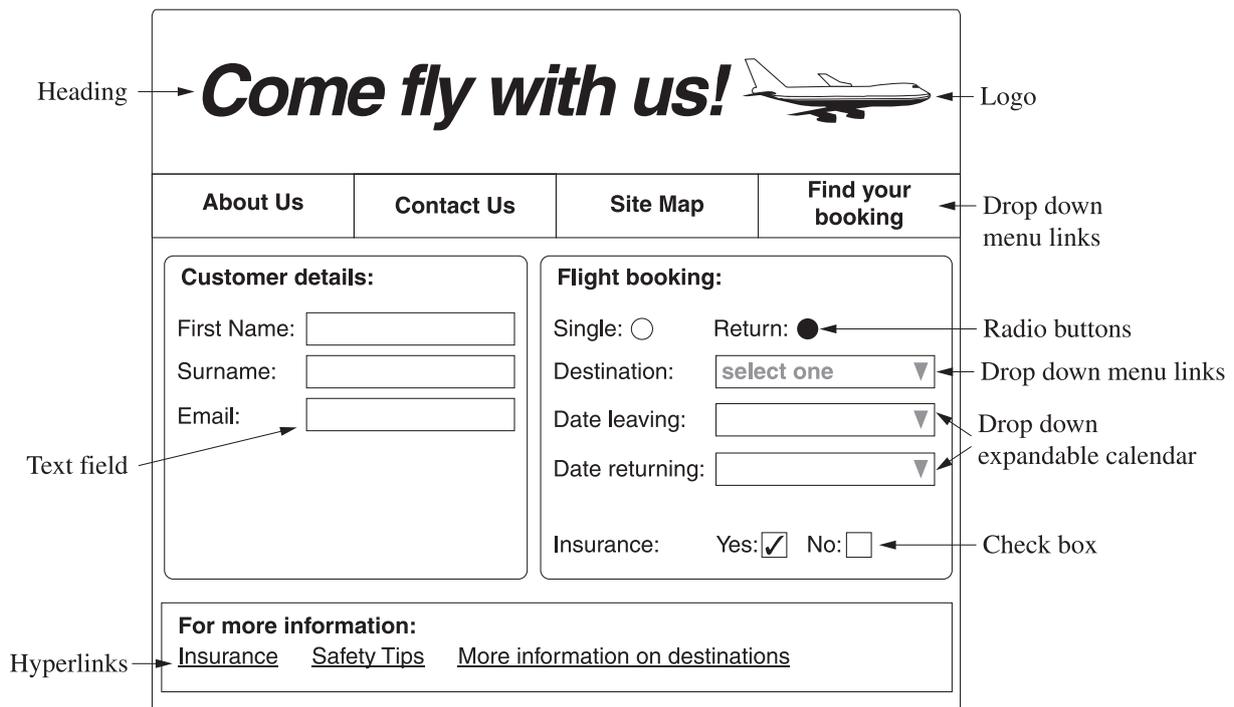| Criteria | Marks |
|---|---|
| • Provides an explanation showing a clear understanding of features of free text searching relating to the scenario | 3 |
| • Demonstrates some understanding of free text searching | 2 |
| • Identifies a feature of free text searching | 1 |

*Sample answer:*

The text search provided makes use of the '*' wild card which would extract multiple characters before and/or after the partial text string eg *ang would return Da Nang and Na Trang. The logic operator 'or' would ensure each of the cities would be returned from the search.

**Question 23 (c)**

| Criteria | Marks |
|---|---|
| • Draws a clearly labelled diagram that identifies all the requirements of the scenario, demonstrating comprehensive understanding of homepage design | 5 |
| • Draws a labelled diagram that identifies most of the requirements of the scenario, demonstrating good understanding of homepage design | 4 |
| • Draws a labelled diagram that identifies some of the requirements of the scenario, demonstrating some understanding of homepage design | 3 |
| • Attempts a design with few relevant features demonstrating limited understanding of webpage design | 2 |
| • Attempts a design that identifies at least a feature | 1 |

*Sample answer:*

**Question 24 (a)**

| Criteria | Marks |
|---|---|
| • Produces a labelled diagram which indicates a clear understanding of the communication technologies required for this system | 3 |
| • Produces a labelled diagram which indicates some understanding of communication technologies | 2 |
| • Indentifies a feature of communication technologies | 1 |

*Sample Answer*                                                    *Answer could include:*



Laptop with 3G modem, comm and DB software

3G Tower

Company server (central DB location)

Modem

Internet
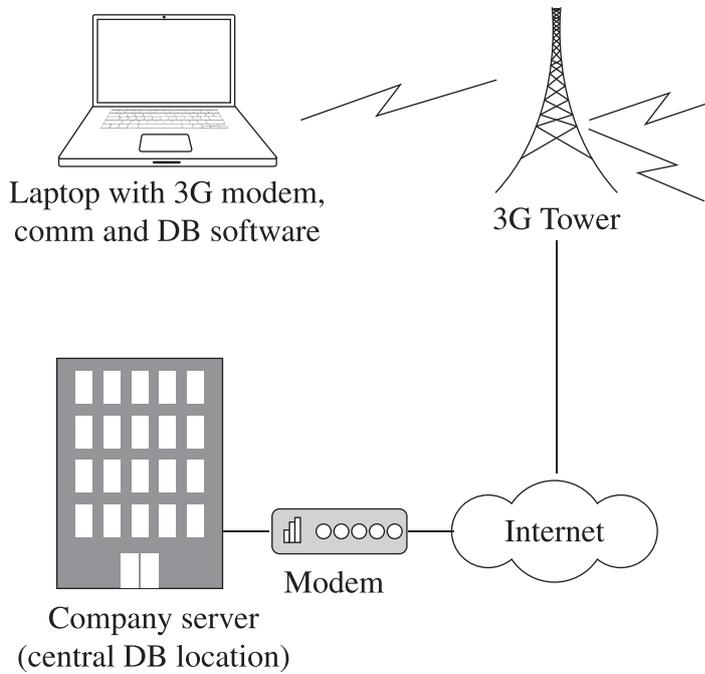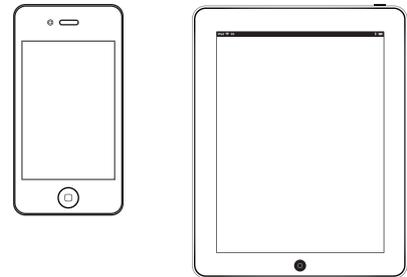
## Question 24 (b)

| Criteria | Marks |
|---|---|
| • Constructs a substantially correct schema representing all related tables and showing the primary and foreign keys and relationships | 4 |
| • Constructs a schema that identifies most of the related tables and keys | 3 |
| • Constructs a schema that identifies some tables demonstrating some understanding of relational databases | 2 |
| • Attempts a schema OR indicates a feature of a schema | 1 |

*Sample answer:*

Order
Order ID
Item
Quantity
Cost

Invoice
Invoice ID
Order ID
Customer ID
Employee ID
Date ordered
Date required

Customer
Customer ID
Surname
Given Name
Contact number
Business nam

Employee
Employee ID
Surname
Given Name
Contact number

Key
——— Primary keys
- - - - - - - Foreign keys
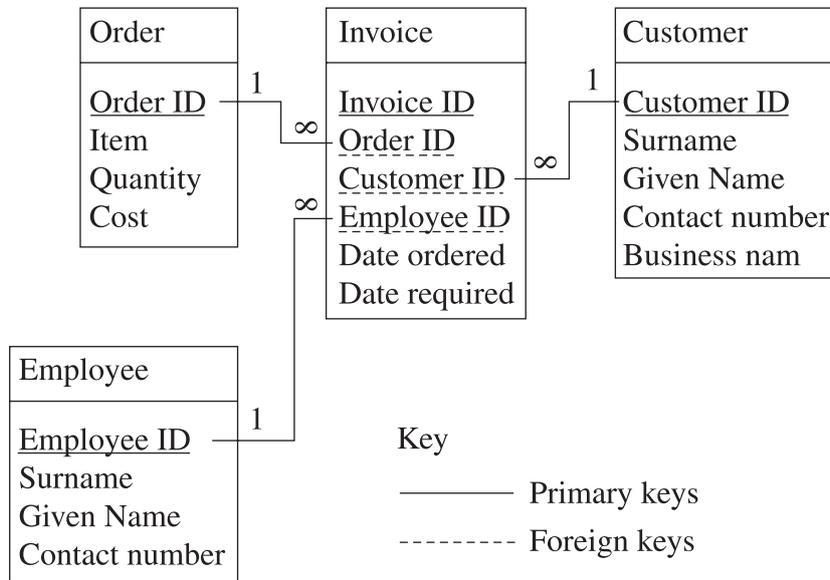
[Note: Students may identify a one-to-one relationship between the Invoice and Order table based on the sample data. This will be an acceptable answer.]

**Question 24 (c)**

| Criteria | Marks |
|---|---|
| • Provides a discussion demonstrating clear understanding of the issues associated with the outsourcing proposal | 5 |
| • Provides a discussion demonstrating understanding of some of the issues associated with the outsourcing proposal | 4 |
| • Describes some issues related to the outsourcing proposal | 3 |
| • Identifies issues demonstrating a limited understanding of outsourcing | 2 |
| • Identifies a feature of outsourcing | 1 |

*Sample answer:*

Outsourcing the hosting of the database can be cost efficient due to a third party managing the security, ongoing maintenance and backup procedures. The outsourcing company would house the information technology including laptops, servers, application software and communications hardware. Licensing of software would also be held by the outsourcing company meaning another ongoing cost saving. As the servers and hence data is held offsite the likelihood of malicious damage or theft is reduced.

In addition, the outsourcing company would also have employees with the relevant technical skills to effectively manage the database resulting in significant cost savings to the company.

Outsourcing draws control away from decision makers in the company meaning that any changes requested may not be completed in a timely manner. It also means the process of changing access levels to various parts of the system is in the hands of the outsourcing company and could involve a lengthy approvals process. While the company owns the data, its management is in the hands of the outsourcing company meaning they have complete access to it. Any exposure of data could include sensitive details about employees, customers and management and could present a privacy and security issue.

In the event of a server outage at the outsourcing company, trading at the company could be at a standstill until appropriate data recovery and alternate hosting arrangements are finalised. This could result in loss of income and customer faith in the reliability of the business.

# Section III

## Question 25 (a) (i)

| Criteria | Marks |
|---|---|
| • Identifies a strength and a weakness of an online ticketing system | 2 |
| • Identifies a strength OR weakness of an online ticketing system | 1 |

*Sample answer:*

Strength:    Tickets can be purchased anywhere anytime.
Weakness:    An understanding and availability of technology is required to use the system.

## Question 25 (a) (ii)

| Criteria | Marks |
|---|---|
| • Clearly explains the importance of data quality in a TPS using an example | 3 |
| • Describes data quality<br>OR<br>• Provides an example with some elaboration on data quality | 2 |
| • Identifies a feature of data quality | 1 |

*Sample answer:*

If the data in a transaction processing system has errors or duplication, then people using the system will be affected because of the incorrect data. Their work will be incorrect or incomplete. For example, if stock levels in a transaction processing system database are incorrect, or not up-to-date, staff will not reorder items that have low stock levels.

## Question 25 (b) (i)

| Criteria | Marks |
|---|---|
| • Correctly describes how batch and real time processing are applied in an ATM transaction | 3 |
| • Provides a description of batch and/or real time processing in relation to ATM transactions | 2 |
| • Identifies a feature of batch or real time processing | 1 |

*Sample answer:*

Real time processing for an ATM transaction includes adjustment of the account balance and the levels of cash left in the ATM containers. Batch processing includes storing the details of the transaction for the customer account, so that at the end of each month, statements containing the itemised transactions can be generated and sent to customers.

## Question 25 (b) (ii)

| Criteria | Marks |
|---|---|
| • Provides an explanation demonstrating a clear understanding of the importance of periodically testing the alternative procedures for a TPS | 4 |
| • Provides an explanation demonstrating some understanding of the importance of testing the alternative procedures for a TPS | 3 |
| • Demonstrates a limited understanding of the importance of testing the alternative procedures for a TPS | 2 |
| • Identifies a feature of testing or alternative procedures | 1 |

*Sample answer:*

Periodic testing is necessary to ensure these alternative procedures work. As online TPS procedures change due to system/database upgrade, alternative procedures need to be redesigned to reflect these changes.

Periodic testing also allows staff to carry out the alternative procedures confidently. As staff leave and are replaced, periodic testing also facilitates training of new staff in the latest alternative procedures.

Periodical testing of alternative procedures ensures the correct recording of transactions and allows the business to continue their operations uninterrupted. Periodically testing these procedures would ensure the smooth updating of the master database when the TPS is operational.
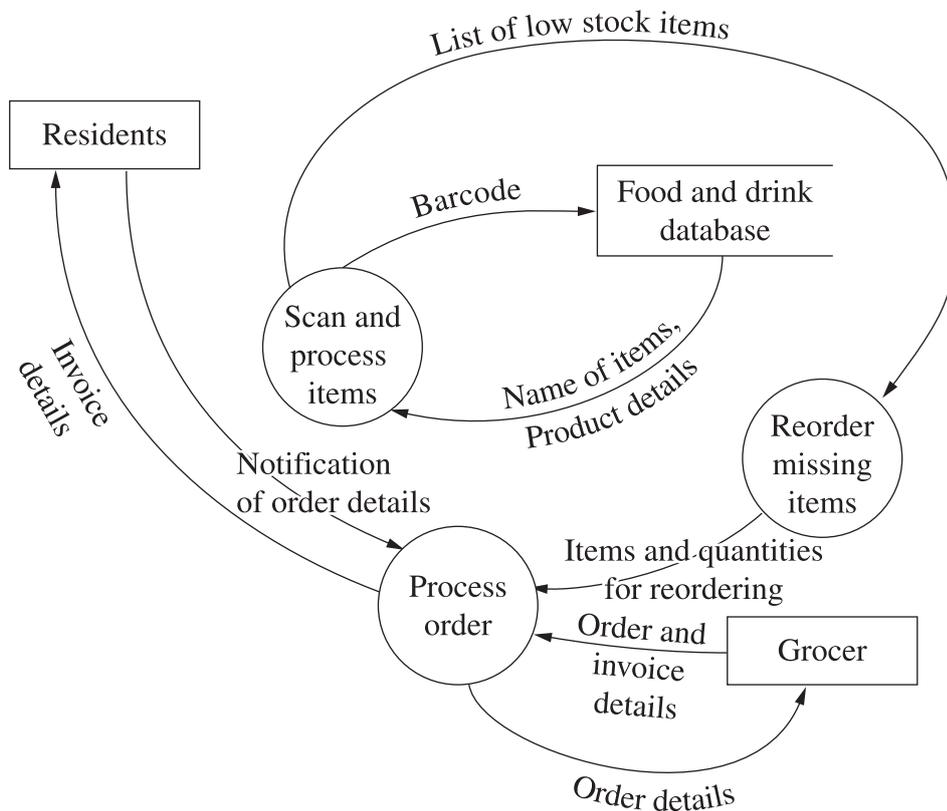
**Question 25 (c) (i)**

| Criteria | Marks |
|---|---|
| • Describes the shifting of workload for both residents and supermarket staff as a result of the 'smart' refrigerator system | 3 |
| • Describes the shifting of workload for residents OR supermarket staff<br>OR<br>• Outlines the shifting of workload for residents and supermarket staff | 2 |
| • Identifies a shift in workload for residents OR supermarket staff | 1 |

*Sample answer:*

A process that was previously undertaken by residents, such as compiling shopping lists, is now automated and carried out by the smart refrigerator. The residents maintain control of the system by either selecting automatic by scanning items in and out or by initiating a manual order of products that are in high demand. The sales process that was typically carried out by a cashier will no longer be needed as this is now shifted to the customer/smart refrigerator. This also streamlines the payment and delivery process. A person at the supermarket would pick the items requested off the shelf and package in preparation for delivery instead of the residents doing this. This clerk now scans the item instead of the customer. A delivery driver would transport the goods instead of the residents driving to and from shopping centres.

**Question 25 (c) (ii)**

| Criteria | Marks |
|---|---|
| • Provides a substantially correct data flow diagram including processes, external entities, data stores and data flows | 5 |
| • Provides a mostly correct data flow diagram demonstrating a sound understanding of the problem | 4 |
| • Provides a dataflow diagram indicating some relevance to the problem | 3 |
| • Provides an attempt indicating a limited understanding of a data flow diagram | 2 |
| • Attempts data flow diagram | 1 |

*Sample answer:*



[Note: This is one of many possible solutions.]

**Question 26 (a) (i)**

| Criteria | Marks |
|---|---|
| • Identifies advantages of using graphs to represent data in spreadsheets | 2 |
| • Identifies a feature of spreadsheet graphs | 1 |

*Sample answer:*

Graphs can be used to easily identify trends and clustering of data, representing a large amounting of data simply. You can use different graphs to represent different data in different formats. Graphs are better for people who work visually.

**Question 26 (a) (ii)**

| Criteria | Marks |
|---|---|
| • Clearly describes the effects of automated decision making on participants indicating a clear understanding of decision support systems | 3 |
| • Describes an effect of automated decision making on a participant indicating an understanding of decision support systems | 2 |
| • Identifies a feature of automated decision making | 1 |

*Sample answer:*

Automated decision making, as used in a call centre, would make the work of participants more routine, repetitive, and likely faster. Participants would be required to follow set scripts and enter data, after which the automated DSS would recommend a decision. This would require lower skill levels from participants and likely make their work less interesting. Participants would not need to make decisions, but assess the recommendation of the DSS and take appropriate action.

**Question 26 (b) (i)**

| Criteria | Marks |
|---|---|
| • Clearly distinguishes the differences between structured and unstructured decision making providing an example of each | 3 |
| • Describes structured or unstructured decision making<br>OR<br>• Outlines structured and unstructured decision making | 2 |
| • Identifies a feature of either structured or unstructured decision making | 1 |

*Sample answer:*

An example of a structured decision is whether to offer a home loan to a customer. It is structured because there are clear conditions that need to be met, and an offer can be made if a customer meets all the conditions. This type of decision is often made rationally. An example of an unstructured decision would be, whether to start a business. There are lots of variables that are unknown, and a previous decision to open a business in one location cannot be directly applied in a new situation.

Note: Other examples could include:

*Structured decisions*: product reorder triggered by reorder levels; offer of an insurance policy at a particular price

*Unstructured decision*: whether to purchase stocks and shares; Triage of patient in an emergency situation.

**Question 26 (b) (ii)**

| Criteria | Marks |
|---|---|
| • Provides a discussion demonstrating a clear understanding of the role of the expert in the development of an expert system | 4 |
| • Demonstrates some understanding of the role of the expert in the development of an expert system | 3 |
| • Demonstrates limited understanding of the role of the expert in the development of an expert system | 2 |
| • Identifies a role in the development of an expert system | 1 |

*Sample answer:*

Experts possess extensive knowledge and experience in a particular area. This knowledge and experience is used in the development of the expert system. They can also make a judgement when unusual results are produced from the expert system. Experts can offer the probability of conditions resulting in a particular outcome, based on their experience.

Experts should be able to solve the problem and should be available so that the designers can create the system using knowledge engineering.

Experts can be consulted to ensure that the goals of the expert system are met.

**Question 26 (c) (i)**

| Criteria | Marks |
|---|---|
| • Describes the effects on the residents of the 'smart' house if a power failure occurs | 3 |
| • Identifies some effects on the residents of the 'smart' house if a power failure occurs | 2 |
| • Identifies an effect if a power failure occurs | 1 |

*Sample answer:*

If the main controller experienced a power failure then the fans, air conditioning and heating lights may not function correctly or work at all. Windows will need to be manually opened and closed. These can all pose issues to the comfort levels within the house as the temperature will not be controlled to be at a comfortable level causing it to be too warm or too cold within the house.

If the main controller fails while the user is not home, it may be difficult for the user to manually restore comfortable temperature levels on returning. Also, the controller needs to be able to open and close windows depending on whether it is raining and if it is raining and the controller fails while the user is not home then damage may be caused to the inside of the house.

**Question 26 (c) (ii)**

| Criteria | Marks |
|---|:---:|
| • Correctly explains how a method of chaining could be applied using relevant examples of facts and rules | 5 |
| • Shows a good understanding of a method of chaining using examples of facts and rules | 4 |
| • Shows some understanding of a method of chaining using examples of facts and/or rules | 3 |
| • Shows a basic understanding of a method of chaining | 2 |
| • Identifies a feature of an expert system | 1 |

*Sample answer:*

Application of forward chaining:

If the inside temperature is 32°C and the humidity is 30%, these facts will be stored in the database of facts. The inference engine will use these facts to search for relevant if-then rules in the knowledge base. It will apply the rules to determine appropriate actions.

In this case, the following rules will apply:

    If  *(Inside temperature > 30°C)* and *(Humidity < = 50%)* then
       Set *Fan* to 'Medium'

    If  *(Inside temperature > 30°C)* and *(Humidity < = 50%)* then
       Set *Cooling* to 'On'

    If  *(Inside temperature > 30°C)* and *(Humidity < = 50%)* then
       Set *Heating* to 'Off'

    If  *(Inside temperature > 30°C)* and *(Humidity < = 50%)* then
       Set *Window* to 'Closed'

This means that the fan will be set to medium, the heating will be turned off or remain off, and the window will be closed or remain closed.

**Question 27 (a) (i)**

| Criteria | Marks |
|---|---|
| • Describes an application that uses a sensor which reacts to movement | 2 |
| • Identifies a feature of a sensor or an application | 1 |

*Sample answer:*

An automatic sliding door would contain motion sensors that would respond to movement by opening and closing their doors.

*Answers could include:*

- Automatic sliding doors
- Traffic lights sensor pads
- Entry to gated areas
- Sensor lights
- Sprinkler systems
- Baggage handling systems
- Conveyer belt on checkouts

**Question 27 (a) (ii)**

| Criteria | Marks |
|---|---|
| • Identifies disadvantages for workers of an automated manufacturing system demonstrating clear understanding | 3 |
| • Identifies disadvantages for workers of an automated manufacturing system demonstrating some understanding | 2 |
| • Identifies a disadvantage of an automated manufacturing system | 1 |

*Sample answer:*

Automated manufacturing systems (AMS) disadvantage workers by making them redundant due to systems carrying out repetitive tasks. This can lead to higher unemployment and require these workers to cross train or learn tasks that require higher skill levels. (retrain)

**Question 27 (b) (i)**

| Criteria | Marks |
|---|---|
| • Clearly distinguishes the differences between discrete and continuous processing providing an example of each | 3 |
| • Describes discrete or continuous processing<br>OR<br>• Outlines discrete and continuous processing | 2 |
| • Identifies a feature of either discrete OR continuous processing | 1 |

*Sample answer:*

Discrete processing manufactures one item – possibly a customised order (eg furniture, car) while continuous processing manufactures high volume similar items (eg tinned fruit) in a production line

**Question 27 (b) (ii)**

| Criteria | Marks |
|---|---|
| • Clearly describes the use of RFID tags to assist in inventory tracking using an example | 4 |
| • Demonstrates some understanding of the use of RFID tags to assist in inventory tracking | 3 |
| • Demonstrates a limited understanding of the use of RFID tags | 2 |
| • Identifies a feature of RFID tags | 1 |

*Sample answer:*

A replacement part of a machine for an automated assembly line is initially delivered and receipted with an RFID tag at the distribution centre. The RFID tag would then be scanned and assigned a shelf location within the distribution centre. The database is updated with the new shelf location.

When an order for the item being tracked is placed, the database is consulted and the part retrieved and sent to dispatch. The RFID tag is scanned to reflect the new status and delivered to the required destination.

When the part malfunctions, it is extracted, the RFID tag scanned and sent to the repairer for fixing. The database is updated to reflect the new status. Once repaired, the RFID tag is scanned and repair information updated on the database.

The part is then sent back to the distribution centre and re-scanned in the event of future orders for the part. The database is updated with the new shelf location.

A history of the movements of the item is present in the database for the life of the part.

**Question 27 (c) (i)**

| Criteria | Marks |
|---|---|
| • Identifies the benefits for residents of the automated drip watering system over a manual system with reference to the scenario | 3 |
| • Identifies benefits of the automated drip watering system demonstrating some understanding | 2 |
| • Identifies benefits of the automated drip watering system demonstrating limited understanding | 1 |

*Sample answer:*

The automated watering system benefits the plants by maintaining constant and consistent levels of moisture and nutrients. The automated system can update the settings to suit the climate/season without the need for continuous checking. It provides more flexible opportunities for residents to leave the plants unattended for longer periods of time. They can go on holiday and in excessively hot weather the system can adjust to suit the climate. It can potentially save the costs associated with replacing plants that have died due to lack of care. Consistency in quality control.

**Question 27 (c) (ii)**

| Criteria | Marks |
|---|---|
| • Correctly explains the technical problems that could occur with the monitoring system AND clearly labels a refined block diagram | 5 |
| • Explains some of the technical problems that could occur with the monitoring system AND shows a labelled block diagram | 4 |
| • Describes technical problems that could occur with the monitoring system<br>OR<br>• Provides a clearly labelled block diagram that attempts to address the technical problems in the scenario | 3 |
| • Provides a basic understanding of a technical problem that could occur with the monitoring system<br>OR<br>• Shows a some understanding of block diagrams | 2 |
| • Shows a feature of a block diagram<br>OR<br>• Identifies a technical problem that could occur with the monitoring system | 1 |

*Sample answer:*
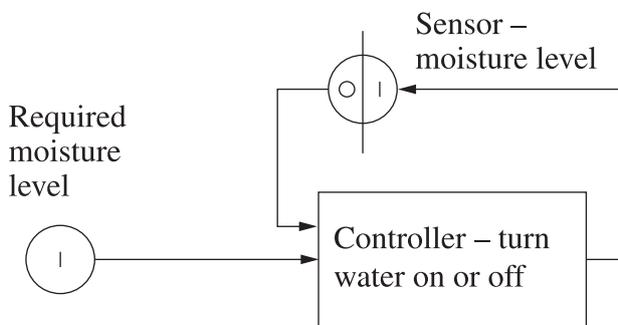


Technical problems that can arise from a continuous monitoring system, such as this one, are overdamping and under damping. Over and under damping in this scenario would result from the level of drainage from the pot plants and the rate at which water is added.

If the pot plants were too well drained then they would dry out quickly, water would be added and then drain away quickly. The system would be underdamped, with water being rapidly turned on and off with little chance of reaching the ideal moisture level.

If there were too much water added to pot plants that have little drainage, the system would rely on evaporation to remove the excess water. This would result in it taking a long time to move towards the ideal moisture levels. This system would be overdamped.

[Note: This block diagram is one of many possible answers for this scenario.]

**Question 28 (a) (i)**

| Criteria | Marks |
|---|---|
| • Identifies different devices that are used to display elements of multimedia | 2 |
| • Identifies a display device | 1 |

*Sample answer:*

Multimedia displays could include visual displays such as LCD screens, audio displays such as speakers, touch feedback displays such as moving platforms and a combination such as head-up displays.

*Answers could include:*

Any of the following:

• Screens including CRT displays, LCD displays, plasma displays and touch screens, 3D screens

• Digital projection devices

• Speakers, sound systems

• Head-up displays and head-sets

• Touch feedback displays including vibrations, moving platforms

• 3D printer, printer, plotter

**Question 28 (a) (ii)**

| Criteria | Marks |
|---|---|
| • Clearly explains how a developer can ensure that a multimedia project does not breach copyright | 3 |
| • Demonstrates some understanding of copyright laws | 2 |
| • Demonstrates a limited understanding of copyright | 1 |

*Sample answer:*

A developer can ensure that a website observes copyright law by using a combination of:

• Using original material

• Seek permission from creators of non-original material and paying any fees required

• Acknowledgment of sources

• Provide links to other websites that have copyright material rather than putting a copy of copyright material on their website

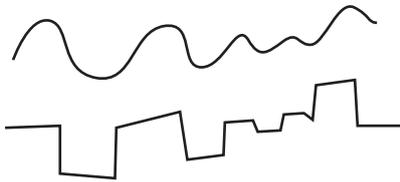• Seek permission to add copyright material to their multimedia system.

**Question 28 (b) (i)**

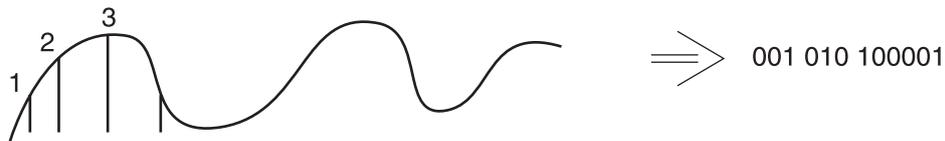| Criteria | Marks |
|---|---|
| • Provides a description demonstrating a clear understanding of the process taken to digitise analog sound | 3 |
| • Demonstrates an understanding of the process taken to digitise analog sound | 2 |
| • Identifies a feature of analog to digital conversion | 1 |

*Sample answer:*

Data would be captured in analog format using a microphone and recording the data in its analog format as a continuous wave signal. The analog signal would digitised by sampling the audio signal at regular intervals and converting each sample to a numerical value. The numerical value would be converted and stored as binary values.



OR



OR



001 010 100001

**Question 28 (b) (ii)**

| Criteria | Marks |
|---|---|
| • Provides an explanation demonstrating a clear understanding of the role of a multimedia system designer when developing a system | 4 |
| • Provides a description demonstrating an understanding of the role of a multimedia system designer | 3 |
| • Describes the role of a multimedia system designer | 2 |
| • Identifies a feature of the role of a system designer | 1 |

*Sample answer:*

Multimedia systems designers (MSD) need to take on a number of roles requiring a range of skills. The first is the role of a project manager to oversee the preparation of specifications, design and determining the best development approach. To do this the MSD must possess strong organisation, team building and time management skills.

The need for creativity in developing an intuitive system for late adopters of technology as well as advanced users would also be advantageous. This aspect of their role also requires deep knowledge of hardware, software and communications technologies required to effectively contain and operate the multimedia system. Knowledge in operating and troubleshooting this technology is also an essential skill. For example a multimedia system with high visual and audio processing demands requires the purchase of computers or servers with powerful processors to cater for both.

**Question 28 (c) (i)**

| Criteria | Marks |
|---|---|
| • Clearly explains how the visually-based multimedia interface could be adapted to cater for the needs of residents with sight impairment | 3 |
| • Demonstrates some understanding of how the interface could be adapted | 2 |
| • Identifies a feature of a multimedia interface OR one way to adapt the interface | 1 |

*Sample answer:*

Sight-impaired residents may have a diminished capacity to utilise the visual components of the multimedia display. They may not be able to read text size, distinguish colours, identify boundaries or in fact even see the display.

The multimedia display can be adapted to suit the special needs of the individual user in a number of ways:
• Larger visual displays
• Personalised Accessibility settings, eg larger fonts, variation of colours and brightness, voice control and voice recognition
• Alternative I/O devices, eg Braille displays
• Gesture control
• Emphasis on audio capabilities of the multimedia interface
• Sight-impaired users will benefit from the provision of audio, sound voice or gesture controls.

**Question 28 (c) (ii)**

| Criteria | Marks |
|---|---|
| • Designs a storyboard with appropriate use of media formats, clearly labels the key features needed for THREE aspects of the smart house and utilises a non-linear structure | 5 |
| • Draws a storyboard that uses appropriate media formats and labels key features of aspects | 4 |
| • Draws a basic storyboard that uses different media and utilises a non-linear structure | 3 |
| • Attempts to draw a storyboard with minimal features | 2 |
| • Provides features of a storyboard | 1 |

*Sample answer:*

There are a number of approaches the candidate may take in order to answer this question.
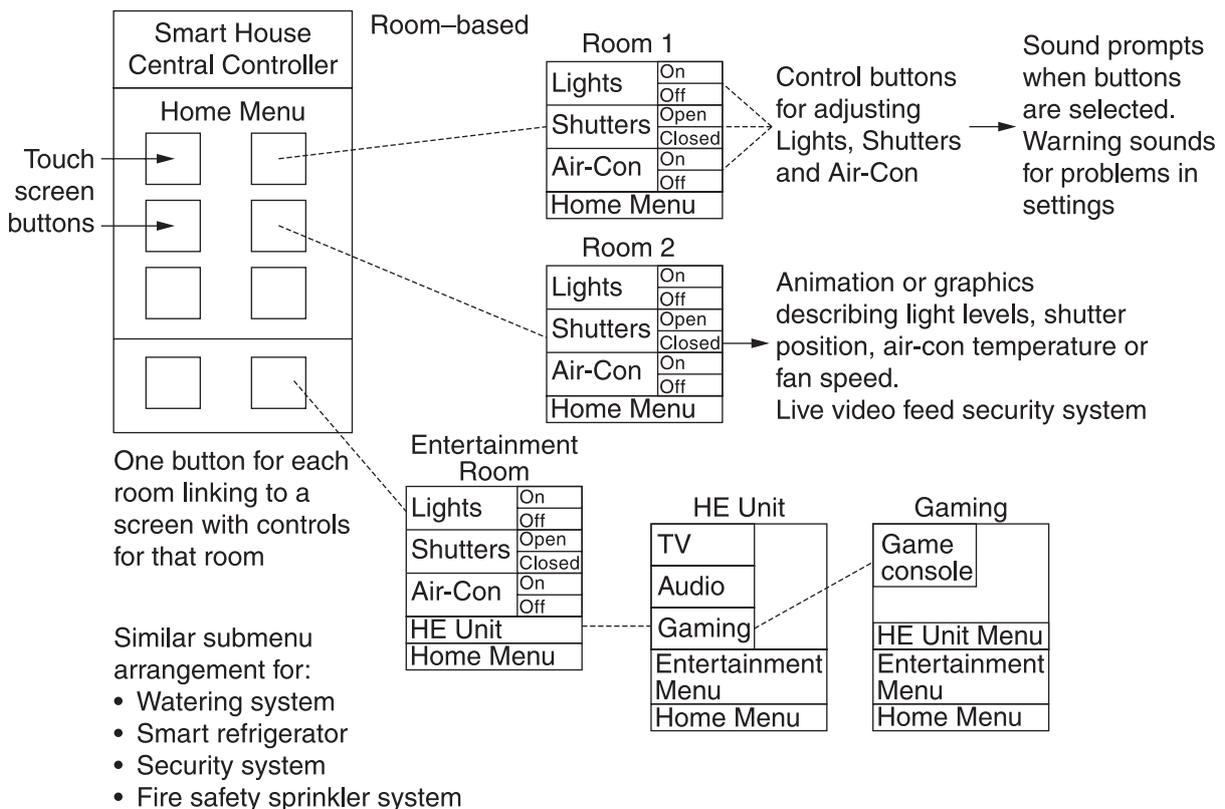


Note:
   Students may organise the three aspects of the controller according to rooms (eg bedrooms, kitchen, lounge etc) or services (eg entertainment system, watering system, fans etc). Storyboards should contain rich multimedia use, such as a live video for security system, animation showing fans are running, or volume levels, sounds for alarms, etc.

# Information Processes and Technology
## 2013 HSC Examination Mapping Grid

**Section I**

| Question | Marks | Content | | Syllabus outcomes |
|---|---|---|---|---|
| 1 | 1 | 9.1 | Project Management | H5.1 |
| 2 | 1 | 9.1 | Project Management | H6.2 |
| 3 | 1 | 9.1 | Project Management | H6.1 |
| 4 | 1 | 9.2 | Information Systems and Databases | H1.2, H2.1 |
| 5 | 1 | 9.3 | Communication Systems | H1.1 |
| 6 | 1 | 9.3 | Communication Systems | H1.1, H5.1 |
| 7 | 1 | 9.1 | Project Management | H6.1 |
| 8 | 1 | 9.3 | Communication Systems | H1.1 |
| 9 | 1 | 9.3 | Communication Systems | H1.2, H2.1 |
| 10 | 1 | 9.3 | Communication Systems | H1.1 |
| 11 | 1 | 9.3 | Communication Systems | H1.1, H3.1 |
| 12 | 1 | 9.2 | Information Systems and Databases | H3.1, H3.2 |
| 13 | 1 | 9.2 | Information Systems and Databases | H2.2, H6.1 |
| 14 | 1 | 9.2 | Information Systems and Databases | H1.1 |
| 15 | 1 | 9.2 | Information Systems and Databases | H1.1 |
| 16 | 1 | 9.3 | Communication Systems | H2.1, H1.1 |
| 17 | 1 | 9.1 | Project Management | H5.1 |
| 18 | 1 | 9.1 | Project Management | H5.1, H6.2 |
| 19 | 1 | 9.2 | Information Systems and Databases | H1.1, H2.1 |
| 20 | 1 | 9.1 | Project Management | H5.1 |

**Section II**

| Question | Marks | Content | | Syllabus outcomes |
|---|---|---|---|---|
| 21 (a) | 2 | 9.3 | Communication Systems | H1.1 |
| 21 (b) | 3 | 9.1 | Project Management | H6.1, H6.2, H7.1 |
| 21 (c) | 3 | 9.3 | Communication Systems | H6.2 |
| 22 (a) | 3 | 9.2 | Information Systems and Databases | H2.1 |
| 22 (b) | 3 | 9.2 | Information Systems and Databases | H1.1, H1.2 |
| 22 (c) | 3 | 9.3 | Communication Systems | H2.2, H4.1, H6.1 |
| 23 (a) | 3 | 9.1 | Project Management | H5.1, H5.2 |
| 23 (b) | 3 | 9.2 | Information Systems and Databases | H1.1, H2.1 |
| 23 (c) | 5 | 9.1 | Project Management | H5.1, H6.1 |

| Question | Marks | Content | | Syllabus outcomes |
|---|---|---|---|---|
| 24 (a) | 3 | 9.3 | Communication Systems | H1.1, H1.2 |
| 24 (b) | 4 | 9.2 | Information Systems and Databases | H1.2, H6.2 |
| 24 (c) | 5 | 9.2 | Information Systems and Databases | H1.1, H3.1, H4.1 |
| | | 9.3 | Communication Systems | |

**Section III**

| Question | Marks | Content | | Syllabus outcomes |
|---|---|---|---|---|
| 25 (a) (i) | 2 | 9.4.1 | Transaction Processing Systems | H1.1 |
| 25 (a) (ii) | 3 | 9.4.1 | Transaction Processing Systems | H2.1 |
| 25 (b) (i) | 3 | 9.4.1 | Transaction Processing Systems | H1.2 |
| 25 (b) (ii) | 4 | 9.4.1 | Transaction Processing Systems | H1.1, H1.2, H2.1, H3.1 |
| 25 (c) (i) | 3 | 9.4.1 | Transaction Processing Systems | H3.1, H7.2 |
| 25 (c) (ii) | 5 | 9.4.1 | Transaction Processing Systems | H6.2 |
| 26 (a) (i) | 2 | 9.4.2 | Decision Support Systems | H1.1, H1.2 |
| 26 (a) (ii) | 3 | 9.4.2 | Decision Support Systems | H2.1, H3.1 |
| 26 (b) (i) | 3 | 9.4.2 | Decision Support Systems | H2.1 |
| 26 (b) (ii) | 4 | 9.4.2 | Decision Support Systems | H7.2 |
| 26 (c) (i) | 3 | 9.4.2 | Decision Support Systems | H3.1 |
| 26 (c) (ii) | 5 | 9.4.2 | Decision Support Systems | H6.2 |
| 27 (a) (i) | 2 | 9.4.3 | Automated Manufacturing Systems | H1.1 |
| 27 (a) (ii) | 3 | 9.4.3 | Automated Manufacturing Systems | H3.1 |
| 27 (b) (i) | 3 | 9.4.3 | Automated Manufacturing Systems | H2.1 |
| 27 (b) (ii) | 4 | 9.4.3 | Automated Manufacturing Systems | H3.1, H7.2 |
| 27 (c) (i) | 3 | 9.4.3 | Automated Manufacturing Systems | H1.2, H2.1 |
| 27 (c) (ii) | 5 | 9.4.3 | Automated Manufacturing Systems | H6.2 |
| 28 (a) (i) | 2 | 9.4.4 | Multimedia Systems | H1.1 |
| 28 (a) (ii) | 3 | 9.4.4 | Multimedia Systems | H3.2, H3.1 |
| 28 (b) (i) | 3 | 9.4.4 | Multimedia Systems | H2.1 |
| 28 (b) (ii) | 4 | 9.4.4 | Multimedia Systems | H7.2 |
| 28 (c) (i) | 3 | 9.4.4 | Multimedia Systems | H3.1 |
| 28 (c) (ii) | 5 | 9.4.4 | Multimedia Systems | H6.2 |