

2015 HSC Information Processes and Technology Marking Guidelines

Section I

Multiple-choice Answer Key

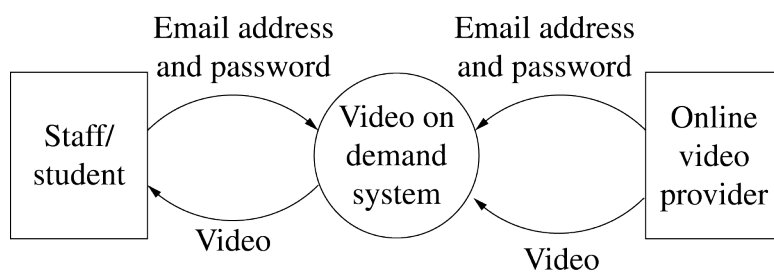
Question	Answer
1	B
2	A
3	B
4	D
5	A
6	A
7	D
8	B
9	D
10	C
11	D
12	C
13	B
14	C
15	C
16	D
17	B
18	A
19	C
20	B

Section II

Question 21 (a)

Criteria	Marks
• Draws a context diagram that represents the system	3
• Uses a diagram with some correct context diagram symbols to represent the system	2
• Identifies a feature of context diagrams OR • Shows some understanding of the system	1

Sample answer:



Question 21 (b)

Criteria	Marks
• Recommends a network topology with justification relevant to the scenario	3
• Shows some understanding of a network topology	2
• Identifies a feature of network topologies	1

Sample answer:

A star network topology can be suitable for the LAN. Using the star topology, computers are attached to a central point allowing each computer access to the school server. Inexpensive cabling can be used. If a computer/node fails, the performance of the remaining computers/nodes at the school will not be affected.

Question 21 (c)

Criteria	Marks
• Explains the advantages of using a LAN compared to using a WAN in the system	4
• Outlines some advantages of a LAN over a WAN	3
• Shows some understanding of a LAN and/or a WAN	2
• Identifies a feature of a LAN or a WAN	1

Sample answer:

In the information system, using a LAN to access videos is faster and more reliable as the videos are stored on the school's server and the computers are directly connected to it without the need to access the internet. A WAN would generally have a lower data transfer rate, more data transmission errors and access can also be dependent on internet connection and internet service providers. The school would also have more control over access via a LAN than via a WAN.

Question 22 (a)

Criteria	Marks
• Constructs a decision table to describe the rules that are used to determine if a member is allowed entry	3
• Constructs a table showing some understanding of the conditions and/or rules and/or actions associated with determining if a member is allowed entry	2
• Shows a basic understanding of the conditions or rules or actions associated with determining if a member is allowed entry	1

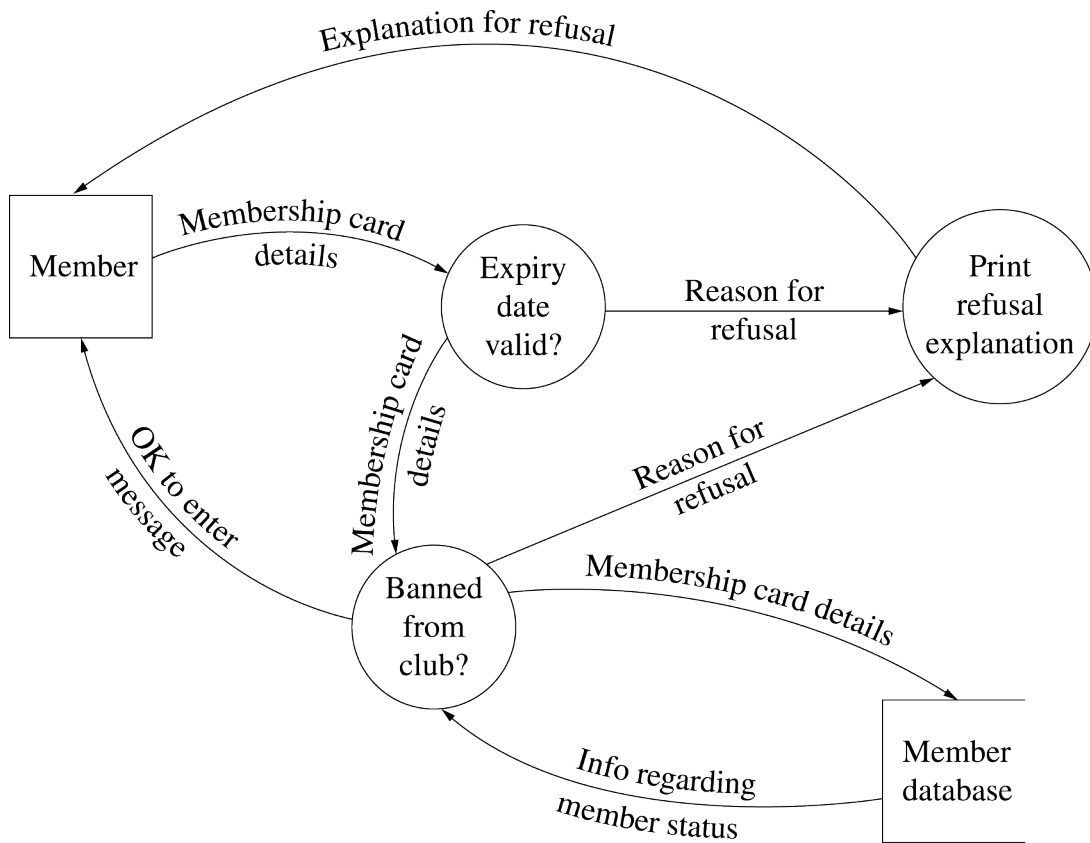
Sample answer:

Conditions	Rules			
	The membership card is expired	×	×	✓
The member is banned	×	✓	×	✓
Actions				
Entry allowed	✓	×	×	×
Entry not allowed	×	✓	✓	✓

Question 22 (b)

Criteria	Marks
<ul style="list-style-type: none"> • Draws a dataflow diagram that shows a thorough understanding of the proposed system • Includes multiple processes, external entity, data store and dataflow 	4
<ul style="list-style-type: none"> • Draws a dataflow diagram that shows a sound understanding of the proposed system • Includes most of the features such as process(es), external entity, data store or dataflow 	3
<ul style="list-style-type: none"> • Draws a diagram that shows some understanding of the proposed system • Uses some dataflow diagram symbols 	2
<ul style="list-style-type: none"> • Identifies a feature of a dataflow diagram <p>OR</p> <ul style="list-style-type: none"> • Draws a diagram that shows a basic understanding of the proposed system 	1

Sample answer:



Question 22 (c)

Criteria	Marks
<ul style="list-style-type: none"> Identifies a suitable combination of conversion methods and justifies the choice showing thorough understanding of system conversion and the scenario 	4
<ul style="list-style-type: none"> Identifies a suitable conversion method and provides a thorough justification OR <ul style="list-style-type: none"> Identifies a suitable combination of conversion methods and shows some understanding of each method 	3
<ul style="list-style-type: none"> Shows some understanding of conversion methods OR <ul style="list-style-type: none"> Identifies a suitable combination of conversion methods 	2
<ul style="list-style-type: none"> Identifies a feature of system conversion 	1

Sample answer:

A combination of pilot and direct conversion methods will be appropriate. Pilot conversion will allow the new system to be trialled in several venues first, ensuring that the machines are easy enough for members to use and that they are capable of handling the volume of traffic, before a full implementation is performed across all venues. For each venue, as it is a low risk implementation, the direct conversion method can be used to save cost and avoid confusion. It can easily revert back to the old manual system if the system fails.

Question 23 (a)

Criteria	Marks
<ul style="list-style-type: none"> Clearly distinguishes between a user and a participant of the system using an example 	3
<ul style="list-style-type: none"> Shows some understanding of a user and/or a participant of the system 	2
<ul style="list-style-type: none"> Identifies a feature of a user or a participant 	1

Sample answer:

When a customer wants to send money to a child using the system, the customer may be viewed as a participant while the child may be viewed as a user. This is because the customer carries out information processes such as requesting a withdrawal by providing account details and the child's mobile phone number (collecting and transmitting) and the child uses the withdrawal code (information output from the system) to take money from an ATM.

Question 23 (b)

Criteria	Marks
<ul style="list-style-type: none"> Identifies components of the information system associated with storing and retrieving, transmitting and receiving and the relationship between them Draws out and relates implications to the information system from these information processes 	5
<ul style="list-style-type: none"> Describes the information system in terms of storing and retrieving, and transmitting and receiving Shows some understanding of the relationship between their components and/or implications of these information processes 	4
<ul style="list-style-type: none"> Provides an outline of the information system in terms of storing and retrieving and/or transmitting and receiving 	3
<ul style="list-style-type: none"> Shows some understanding of storing and/or retrieving and/or transmitting and/or receiving in the information system 	2
<ul style="list-style-type: none"> Identifies a feature of storing or retrieving or transmitting or receiving 	1

Sample answer:

The information system involves a customer transmitting a withdrawal request via their mobile phone to the bank and the bank transmitting a withdrawal code to the customer or a person authorised by the customer. Data transmitted may include bank account details, withdrawal amount and the withdrawal code. These data must be received without error and without comprising the privacy of the customer and the security of the data. Security measures such as encryption and transmission error checking should be implemented. If the data is not transmitted and received correctly, the information process of storing and retrieving will be meaningless.

Details of the customer's withdrawal request such as the withdrawal amount, date, time, confirmation and the authorised person's phone number should be stored in the bank's database accurately and securely so that they can be retrieved for statement processing or in cases of disputes. For example, a customer may complain that a withdrawal code is given to an unauthorised person. To ensure the security of the data stored, access should be restricted to authorised personnel and backup procedures should be implemented.

Question 24 (a)

Criteria	Marks
<ul style="list-style-type: none"> Outlines how CRC can be used in the system 	2
<ul style="list-style-type: none"> Identifies a feature of CRC 	1

Sample answer:

CRC is a method for detecting transaction errors when data is being sent between the customer and the department store. If an error is detected then a request can be made for the data to be resent.

Question 24 (b)

Criteria	Marks
• Clearly identifies issues and provides points for and/or against the use of data mining in the system	4
• Outlines the issues relating to the use of data mining in the system	3
• Outlines features of data mining	2
• Identifies a feature of data mining	1

Sample answer:

Data mining has the potential to improve the efficiency of the business and allow the business to cater to the needs and wants of its customers. However, there are privacy and ethical concerns. The data collected should not be used or shared with business partners without the customer's consent. Even if the customers have given consent for their details to be used for the promotion of products, they may not realise the extent to which data mining can piece together their personal life. It is also questionable whether it is ethical to use this intimate knowledge about an individual to try to entice them to purchase goods or spend money.

Question 24 (c)

Criteria	Marks
• Clearly describes how internet, intranet and extranet technologies would be used in the system	5
• Describes how at least two of the technologies (internet, intranet and extranet) would be used in the system OR • Outlines how internet, intranet and extranet technologies would be used in the system	4
• Outlines how at least two of the technologies (internet, intranet and extranet) would be used	3
• Outlines features of internet and/or intranet and/or extranet technologies	2
• Identifies a feature of internet or intranet or extranet technology	1

Sample answer:

The internet would be used to promote and provide general information about the store. Anyone including the public, the registered customers, the employees and the business partners can access the store's website via the internet.

The intranet would be restricted to access by employees only and would allow employees to share information, files and applications in a local area network. A firewall would be used to prevent outsiders from accessing the intranet.

The extranet would be used by the registered customers and business partners to access their accounts or specific company information via a web portal. They would log on securely using a username and password.

Section III

Question 25 (a)

Criteria	Marks
• Identifies the essential features of a transaction processing system	2
• Identifies a feature of a transaction processing system	1

Sample answer:

A transaction processing system is an information system that collects, stores, modifies and retrieves records of events. It meets record keeping and event tracking needs.

Question 25 (b)

Criteria	Marks
• Clearly explains why both off-site storage and on-site storage are necessary	3
• Shows some understanding of off-site storage and/or on-site storage	2
• Identifies a feature of off-site storage or on-site storage	1

Sample answer:

Off-site storage allows data to be preserved in the event of system destruction within an organisation, eg a fire. It also provides ‘unlimited’ space for storing generations of backed-up data. On-site storage provides immediate access to backed-up data when needed, eg when a document needs to be reverted to a previous version.

Question 25 (c)

Criteria	Marks
• Clearly describes how online transaction processing contributes to the development of transaction processing systems	3
• Shows some understanding of online transaction processing	2
• Identifies a feature of online transaction processing	1

Sample answer:

OLTP is a type of business software program capable of supporting transaction-oriented applications on the internet, typically used for order entry, financial transactions and retail sales. It has the ability to ensure that two users cannot change the same data (eg book a theatre seat) at the same time. It also ensures that all of the steps involved in a transaction are completed successfully or not at all.

Question 25 (d)

Criteria	Marks
• Clearly explains how data integrity and data quality can be maintained in a transaction processing system	4
• Outlines how data integrity and/or data quality can be maintained in a transaction processing system	3
• Shows some understanding of data integrity and/or data quality	2
• Identifies a feature of data integrity or data quality	1

Sample answer:

Data integrity can be maintained in a TPS using data validation and data verification. Data validation uses checks at the time data is collected to ensure that data is reasonable. Data verification ensures that data collected and stored matches the source of data.

Data quality is concerned about the reliability and effectiveness of the data. To achieve effectiveness, data must be accurately collected using the correct instrument, eg relevant questions in a survey. To ensure its reliability, the data needs to be updated over time through periodical reviews.

Question 25 (e) (i)

Criteria	Marks
• Clearly outlines the real-time and batch processing in the centralised payment system	3
• Shows some understanding of the real-time and/or batch processing in the system	2
• Identifies a feature of real-time or batch processing	1

Sample answer:

Real-time processing is used when the smart tag is detected and the smart tag account is automatically debited.

Batch processing is used when the smart tag account debits the bank account of a customer when the smart tag account falls below a minimum balance and when statements are generated.

Question 25 (e) (ii)

Criteria	Marks
• Outlines issues and provides clear points for and/or against the issues regarding the implementation of the system	5
• Outlines issues and provides points for and/or against at least one of the issues regarding the implementation of the system	4
• Outlines issues regarding the implementation of the system	3
• Outlines an issue regarding the implementation of the system	2
• Identifies an issue regarding the implementation of the system	1

Sample answer:

The changing nature of work will affect both customers and employees of the transport system and much of the workload will be shifted to the customers. Customers will need to learn how to use the tags and their accounts, and how to view their transactions online if they want to check their charges without waiting for the statements. The change could be more difficult for people who lack IT skills or without ready access to the internet. Workers who used to work with the old payment system will need to be trained and some may even lose their jobs due to the automation.

Alternative procedures to deal with transactions when the TPS is not working or when a customer forgets to bring their tag are also important. Otherwise, if the tag detection system is not working, no fares can be collected or people would be unable to use the transport system.

Maintaining accurate transactions is highly essential as customers will only be able to check the charges after the events. Disputes may not be easily resolved without adequate measures to keep track of the data used to calculate the fare.

Question 26 (a)

Criteria	Marks
• Identifies the essential features of a decision support system	2
• Identifies a feature of a decision support system	1

Sample answer:

A DSS provides information that is used to aid the decision-making process. It helps to improve consistency of decisions that involve a number of complex variables that need to be considered in the decision-making process.

Question 26 (b)

Criteria	Marks
• Shows a good understanding of how geographic information systems are used to support decision making	3
• Shows some understanding of geographic information systems	2
• Identifies a feature of geographic information systems	1

Sample answer:

Geographic information systems analyse data such as topography, wind speed and vegetation to assist with decision making. For example, a GIS can be used to predict the directions that a fire will travel during a bushfire.

Question 26 (c)

Criteria	Marks
• Clearly describes how spreadsheets can assist with the analysis of data	3
• Shows some understanding of how spreadsheets can assist with the analysis of data	2
• Identifies a feature of spreadsheets	1

Sample answer:

Spreadsheets have built-in statistical functions and a variety of graphs can be generated using spreadsheets. What-if models can also be created using formulae and the built-in functions. In addition, data can be easily transferred between a spreadsheet and a database or other statistics packages.

Question 26 (d)

Criteria	Marks
• Clearly shows the differences between forward and backward chaining using examples	4
• Outlines the differences between forward and backward chaining • Includes at least one example	3
• Shows some understanding of forward and/or backward chaining	2
• Identifies a feature of forward or backward chaining	1

Sample answer:

Forward chaining starts with the known facts and then works through a series of relevant rules to arrive at a conclusion. For example, an expert system may start with a patient's symptoms and then apply relevant rules to arrive at a diagnosis.

Backward chaining starts with a 'conclusion', then works backwards to see if all the conditions are satisfied. If the facts support the conclusion, the conclusion is confirmed. For example, an expert system may start with a patient thinking that he/she has the flu and then work backwards to see if the symptoms support the diagnosis.

Question 26 (e) (i)

Criteria	Marks
• Clearly outlines the benefits of using a neural network in the system	3
• Outlines features of a neural network OR • Outlines a benefit of using a neural network in the system	2
• Identifies a feature of a neural network	1

Sample answer:

There could be many unforeseen factors that would cause the need for alternative routes or the need to adjust timetables. It is difficult for any expert to work out a set of rules that would always provide the 'best' solutions to these problems. Apart from having to make the decision quickly, the decision made may also cause the need for further adjustments. Since neural networks have the ability to recognise patterns, learn from past experience, adjust to new conditions and respond quickly, they are well suited to this unstructured situation.

Question 26 (e) (ii)

Criteria	Marks
• Explains problems that could arise from implementing the system • Provides clear reference to the scenario	5
• Outlines problems that could arise from implementing the system • Provides an explanation for at least one of the problems	4
• Outlines problems that could arise from implementing the system	3
• Outlines a problem that could arise from implementing the system	2
• Identifies a problem that could arise from implementing the system	1

Sample answer:

Erroneous inferences could cause traffic chaos and accidents. For example, incorrect adjustments to the timetables could cause extended delays and inappropriate alternative routes may cause traffic jams. As the logic applied by the neural network is not easily understood, it could also be difficult to explain issues when complaints are received.

If the system is given the responsibility for decision making rather than decision support, the real issues could be undermined. For example, rather than resolving a road issue that causes bus delay, train timetables are constantly adjusted.

While the system can make decisions quickly, other parts of the transport system may not be able to cope with the changes. For example, car, bus and train drivers may find the constant adjustments frustrating.

Question 27 (a)

Criteria	Marks
• Identifies the essential features of an automated manufacturing system	2
• Identifies a feature of an automated manufacturing system	1

Sample answer:

An automated manufacturing system is an information system involved in collecting data from the environment using a range of sensors, processing the data into information that can be used by the system to perform work through a series of processing steps involving actuators.

Question 27 (b)

Criteria	Marks
• Shows a good understanding of how barcode readers are used in an automated manufacturing system	3
• Shows some features of barcode readers	2
• Identifies a feature of barcode readers	1

Sample answer:

Barcode readers are input devices that allow a computer to read barcodes containing information about products or parts in an automated manufacturing system. A barcode is a pattern of wide and narrow bars on a label that enables easy identification of products and parts for the purpose of counting and tracking stock or inventory.

Question 27 (c)

Criteria	Marks
• Clearly describes how a machine-centred system works in an automated warehouse	3
• Outlines some features of machine-centred systems	2
• Identifies a feature of machine-centred systems	1

Sample answer:

In a machine-centred automated warehouse, the warehouse has been designed in a way that allows the machines to operate at their optimum level of efficiency. People working in this warehouse perform tasks that enable the automated components to function properly. Although much of the work in the automated warehouse is performed by robots, sensors, actuators and controllers, the people maintain automated components of the warehouse system.

Question 27 (d)

Criteria	Marks
<ul style="list-style-type: none"> Clearly shows the difference between underdamping and overdamping using examples 	4
<ul style="list-style-type: none"> Outlines the difference between underdamping and overdamping Includes at least one example 	3
<ul style="list-style-type: none"> Outlines some features of underdamping and/or overdamping 	2
<ul style="list-style-type: none"> Identifies a feature of underdamping or overdamping 	1

Sample answer:

Underdamping occurs if the change is completed too fast and the actuator misses the desired level. An example would be where a pool cleaner fails to add the correct chemicals at the time set.

Overdamping occurs if the change is too slow and the actuator takes longer to reach the desired level or position. An example would be a cruise control system in a car not adjusting to an increase in speed due to the car travelling downhill.

Question 27 (e) (i)

Criteria	Marks
<ul style="list-style-type: none"> Clearly outlines the types of sensors and actuators that can be used in the system 	3
<ul style="list-style-type: none"> Outlines some types of sensors and/or actuators that can be used in the system 	2
<ul style="list-style-type: none"> Identifies a feature of sensors or actuators 	1

Sample answer:

The centralised control system would need pressure sensors in the roads to detect the presence of cars or motion sensors to detect movement along the transport network.

Actuators in this system can include signal lights to control the flow of traffic along particular routes, roads or rail boom gates to restrict traffic in the event of emergency or if restrictions need to be implemented.

Answer could include:

- Flow sensors – video camera which monitors the flow of traffic and identifies any accidents
- Light sensors – looking at the traffic conditions for when street lights should be turned on such as at night
- Actuators – electronic motors – to open or close gates, switch rail lines.

Question 27 (e) (ii)

Criteria	Marks
<ul style="list-style-type: none"> Explains potential benefits that could arise from implementing the system Provides clear reference to the scenario 	5
<ul style="list-style-type: none"> Outlines potential benefits that could arise from implementing the system Provides an explanation to at least one of the problems 	4
<ul style="list-style-type: none"> Outlines potential benefits that could arise from implementing the system 	3
<ul style="list-style-type: none"> Outlines a potential benefit that could arise from implementing the system 	2
<ul style="list-style-type: none"> Identifies a potential benefit that could arise from implementing the system 	1

Sample answer:

The system can deliver fast and reliable customised responses reflecting traffic conditions. Even if the timed signal lights are replaced by human operators, it will take them longer to check the traffic conditions and make the decision. Humans are also more prone to errors due to boredom and other factors which could result in dangerous situations.

Repetitive and boring tasks such as manually opening and closing gates will no longer need to be performed by people. The skills of workers can be better utilised which may lead to a more skilled workforce and higher job satisfaction. Safety of the workers may also be improved as fewer people are required to work on-site.

While the initial cost of the implementation is high, there should be cost advantages for the transport system in the long run due to the reduction of people required to perform repetitive tasks, lower chance of accidents, lower fuel consumption and potentially more customers due to better traffic flow.

Question 28 (a)

Criteria	Marks
<ul style="list-style-type: none"> Identifies the essential features of a multimedia system 	2
<ul style="list-style-type: none"> Identifies a feature of a multimedia system 	1

Sample answer:

Multimedia systems are information systems that combine different types of media to present a message or to entertain. The combination may include the use of text, still images, animation, audio, video.

Question 28 (b)

Criteria	Marks
• Outlines the advantages of producing an online version compared to a print version	3
• Outlines features of the print version and/or the online version	2
• Identifies a feature of the print version or the online version	1

Sample answer:

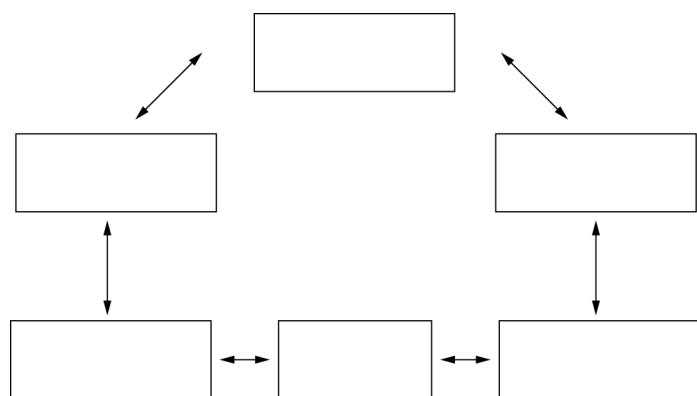
The print version is static in its content, while the online version can include audio and video and may also be interactive. The online version can be accessed using a variety of mobile devices. The content of the online version can be updated easily while changes to the print version would require reprinting, higher cost and more time.

Question 28 (c)

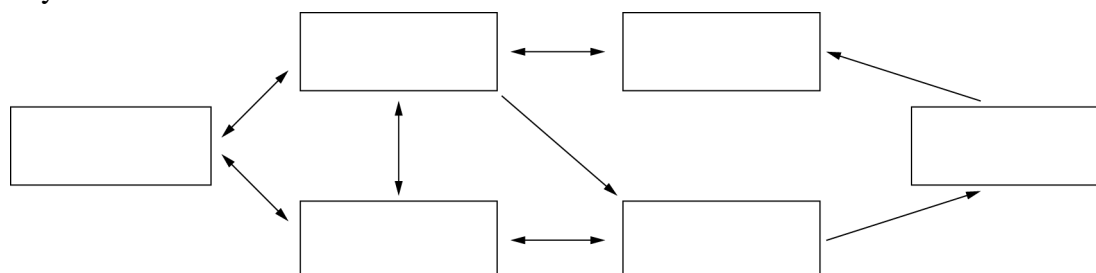
Criteria	Marks
• Clearly shows the differences between hierarchical and non-linear storyboard layouts	3
• Shows some understanding of hierarchical and/or non-linear storyboard layouts	2
• Identifies a feature of hierarchical or non-linear storyboard layouts	1

Sample answer:

Hierarchical layout has a distinct top-down design. The layout begins with a master page, which has links that lead to other pages and these pages contain a link back to other pages and to the master page.



Non-linear has no particular structure. The user can move between different sections/pages in any direction.



Question 28 (d)

Criteria	Marks
• Describes how head-up displays and head-sets are used in virtual reality applications	4
• Outlines features of head-up displays and/or head-sets used in virtual reality applications	3
• Identifies features of head-up displays and/or head-sets used in virtual reality applications	2
• Identifies a feature of head-up displays or head-sets	1

Sample answer:

Head-up displays are devices, eg pair of glasses, where participants watch themselves reacting to the environment, for example, projecting speed, navigation and directions or other information onto the windshield of a car, or a co-pilot seeing flight information overlaid on a virtual terrain.

Head-sets are any device(s) worn on the head that allow users to experience a simulated life, replacing an environment in the real world or imagined world.

Question 28 (e) (i)

Criteria	Marks
• Clearly outlines the skills required of content providers and system designers in the development of multimedia systems	3
• Outlines skills required of content providers and/or system designers in the development of multimedia systems	2
• Identifies a skill required of content providers or system designers in the development of multimedia systems	1

Sample answer:

Content providers will collect the material (audio, images, and text) to provide ready-to-use content. For the maps and timetables, they need skills for these specific fields.

System designers will work through the development of the multimedia system. They plan, design and develop the system. They need to have leadership skills, and be able to schedule and monitor the development of the system.

Question 28 (e) (ii)

Criteria	Marks
• Outlines technical issues and provides clear points for and/or against the issues regarding the implementation of the system	5
• Outlines technical issues and provides points for and/or against at least one of the issues regarding the implementation of the system	4
• Outlines technical issues regarding the implementation of the system	3
• Outlines a technical issue regarding the implementation of the system	2
• Identifies a technical issue regarding the implementation of the system	1

Sample answer:

The information that is communicated in the multimedia system (eg maps, timetables and live visual and audio) requires a great deal of primary and secondary storage, processing power and bandwidth for transmission. System designers need to be able to reduce the size of these files for them to be stored and used on the customers' mobile devices without compromising the quality and clarity of the display.

With the variety of mobile devices available, system designers also need to ensure that compatible file formats are used. This may mean releasing the same information in multiple formats.

If third-party materials such as maps are used, system designers also need to address copyright issues as well as ensuring that updates are incorporated into the multimedia system. Otherwise, customers may be confused by a discrepancy or unable to find a particular street on the map.

2015 HSC Information Processes and Technology Mapping Grid

Section I

Question	Marks	Content	Syllabus outcomes
1	1	9.1 Project Management	H1.1
2	1	9.3 Communication Systems	H3.2
3	1	9.3 Communication Systems	H7.1
4	1	9.2 Information Systems and Databases	H1.1
5	1	9.1 Project Management	H1.1
6	1	9.3 Communication Systems	H3.1
7	1	9.3 Communication Systems	H1.1
8	1	9.1 Project Management	H7.2
9	1	9.2 Information Systems and Databases	H2.1
10	1	9.1 Project Management	H6.2
11	1	9.3 Communication Systems	H1.1
12	1	9.3 Communication Systems	H1.1
13	1	9.1 Project Management	H6.2
14	1	9.2 Information Systems and Databases	H2.1
15	1	9.3 Communication Systems	H1.1
16	1	9.2 Information Systems and Databases	H1.1
17	1	9.3 Communication Systems	H1.1
18	1	9.2 Information Systems and Databases	H1.1
19	1	9.2 Information Systems and Databases	H1.1
20	1	9.3 Communication Systems	H1.1

Section II

Question	Marks	Content	Syllabus outcomes
21 (a)	3	9.1 Project Management	H2.1, H5.1
21 (b)	3	9.3 Communication Systems	H1.1
21 (c)	4	9.3 Communication Systems	H1.1, H2.1
22 (a)	3	9.1 Project Management	H2.1, H5.1
22 (b)	4	9.1 Project Management	H2.1, H5.1
22 (c)	4	9.1 Project Management	H6.1
23 (a)	3	9.2 Information Systems and Databases	H2.1
23 (b)	5	9.2 Information Systems and Databases	H2.1
24 (a)	2	9.3 Communication Systems	H1.1
24 (b)	4	9.2 Information Systems and Databases	H3.1, H3.2
24 (c)	5	9.3 Communication Systems	H1.1

Section III

Question	Marks	Content	Syllabus outcomes
25 (a)	2	Transaction Processing Systems	H2.1
25 (b)	3	Transaction Processing Systems	H1.1
25 (c)	3	Transaction Processing Systems	H1.1, H4.1
25 (d)	4	Transaction Processing Systems	H1.2
25 (e) (i)	3	Transaction Processing Systems	H1.1
25 (e) (ii)	5	Transaction Processing Systems	H3.1
26 (a)	2	Decision Support Systems	H2.1
26 (b)	3	Decision Support Systems	H1.1, H4.1
26 (c)	3	Decision Support Systems	H1.1
26 (d)	4	Decision Support Systems	H1.1
26 (e) (i)	3	Decision Support Systems	H1.1
26 (e) (ii)	5	Decision Support Systems	H3.1
27 (a)	2	Automated Manufacturing Systems	H2.1
27 (b)	3	Automated Manufacturing Systems	H1.1
27 (c)	3	Automated Manufacturing Systems	H3.1, H1.2
27 (d)	4	Automated Manufacturing Systems	H1.1
27 (e) (i)	3	Automated Manufacturing Systems	H1.1
27 (e) (ii)	5	Automated Manufacturing Systems	H3.1
28 (a)	2	Multimedia Systems	H2.1
28 (b)	3	Multimedia Systems	H1.1
28 (c)	3	Multimedia Systems	H1.1
28 (d)	4	Multimedia Systems	H1.1
28 (e) (i)	3	Multimedia Systems	H1.1
28 (e) (ii)	5	Multimedia Systems	H3.1