

2015 HSC Information and Digital Technology

Networking and hardware

Marking Guidelines

Section I

Multiple-choice Answer Key

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

Section II

Question 21 (a)

Criteria	Marks
• States what is meant by ‘recommended requirements’	1

Sample answer:

The hardware requirements needed so that the OS can perform at its optimum.

Question 21 (b)

Criteria	Marks
• Outlines the differences between <i>hibernate</i> and <i>suspend</i>	3
• Identifies features of <i>hibernate</i> and/or <i>suspend</i>	2
• Identifies a feature of <i>hibernate</i> or <i>suspend</i>	1

Sample answer:

In a hibernate state, the computer saves data to the hard drive and stops drawing power. In a suspend state, the computer saves data to RAM and still maintains a low power connection. This means the computer will restart more quickly from a suspend position.

Question 21 (c)

Criteria	Marks
• Identifies the difference between <i>batch</i> and <i>real-time</i> systems	2
• Identifies a feature of <i>batch</i> or <i>real-time</i> systems	1

Sample answer:

A real-time system handles events at the time as they occur. A batch system groups the tasks and then processes them at the same time at a later time.

Question 22 (a)

Criteria	Marks
• Identifies TWO relevant aspects of antivirus software	2
• Identifies ONE feature of antivirus software	1

Sample answer:

Antivirus software compares files against its database to ascertain if the file is corrupted. It also provides alerts to show actions taken.

Question 22 (b)

Criteria	Marks
• Outlines TWO relevant tasks	3
• Identifies TWO relevant tasks OR • Outlines ONE relevant task	2
• Identifies ONE relevant task OR • Shows a basic understanding of a routine maintenance schedule	1

Sample answer:

A routine maintenance schedule should include regular scanning to check for viruses and/or malicious software, and perform quarantine and removal if necessary. It should also regularly update security and performance scanning and checking for operating system, application software and firmware.

Answers could include:

- Cleaning and repairing of equipment
- Regular optimisation of HDD

Question 23

Criteria	Marks
• Clearly explains the benefits of effective teamwork	4
• Outlines benefits of effective teamwork OR • Identifies benefits of effective teamwork and explains at least one	3
• Identifies benefits of effective teamwork OR • Outlines a benefit of effective teamwork	2
• Identifies a benefit of effective teamwork	1

Sample answer:

ICT projects are usually complex requiring various areas of expertise. Each team member may contribute their specific skills, such as programming, authoring or graphic design. The project may be completed more quickly if team members work on different components and then bring their contribution to the team to complete the project. This may also allow team members to work from home or work flexible hours.

Answers could include:

- Idea generation
- Area of expertise
- Sharing workload
- Improved efficiency
- Mutual support

Question 24 (a)

Criteria	Marks
• Outlines why motherboards have expansion slots using an example	2
• Shows an understanding of expansion slots	1

Sample answer:

They allow additional hardware to be connected to the computer, such as Ethernet cards to allow connection to a network.

Question 24 (b)

Criteria	Marks
• Shows a sound understanding of why the usable storage space on a magnetic hard drive differs from its physical size	2
• Shows a basic understanding of usable storage space or physical storage space of a magnetic hard drive	1

Sample answer:

Space is required on the hard drive to store formatting type, file systems and boot data.

Answers could include:

- Method of formatting
- Use of table allocation array
- Use of sectors and blocks

Question 24 (c)

Criteria	Marks
• Explains the advantages of using a separate graphic adapter card compared to an inbuilt graphics chip on the motherboard	4
• Outlines advantages of using a separate graphics adapter card compared to an inbuilt graphics chip on the motherboard OR • Identifies advantages of using a separate graphics adapter card compared to an inbuilt graphics chip on the motherboard AND • Explains at least one of the advantages	3
• Identifies features of a graphics adapter card and/or an inbuilt graphics chip	2
• Identifies a feature of a graphics card or an inbuilt graphics chip	1

Sample answer:

A separate graphic adapter card has its own independent source of video memory and processing power leaving the RAM and the CPU in the system to do other tasks. It allows graphic intensive tasks to be performed without jeopardising the performance of the system. It is particularly valuable for professional graphic designers or serious gamers. With its own cooling system it can help with system cooling while allowing the use of more than one output monitor.

Answers could include:

- Increased graphics speed
- Separate graphic processor
- Different output, eg DVI, HDMI
- Free up the CPU and RAM to do other work on the computer

Question 25

Criteria	Marks
• Shows substantial understanding of why it is important to document user support requests	3
• Outlines a reason or identifies reasons for documenting user support requests	2
• Shows a basic understanding of user support requests	1

Sample answer:

- Keeps a record of who initiated the request
- Allows to track the time the requests were logged and how long it took to rectify the problem
- Traces patterns/trends with problem equipment

Answers could include:

- Informs future equipment selection
- Assists with developing user manuals

Question 26

Criteria	Marks
• Identifies the advantages of using a survey compared to using interviews AND outlines at least one advantage	4
• Identifies some advantages of using a survey compared to using interviews	3
• Identifies features of surveys and/or interviews	2
• Identifies a feature of a survey or an interview	1

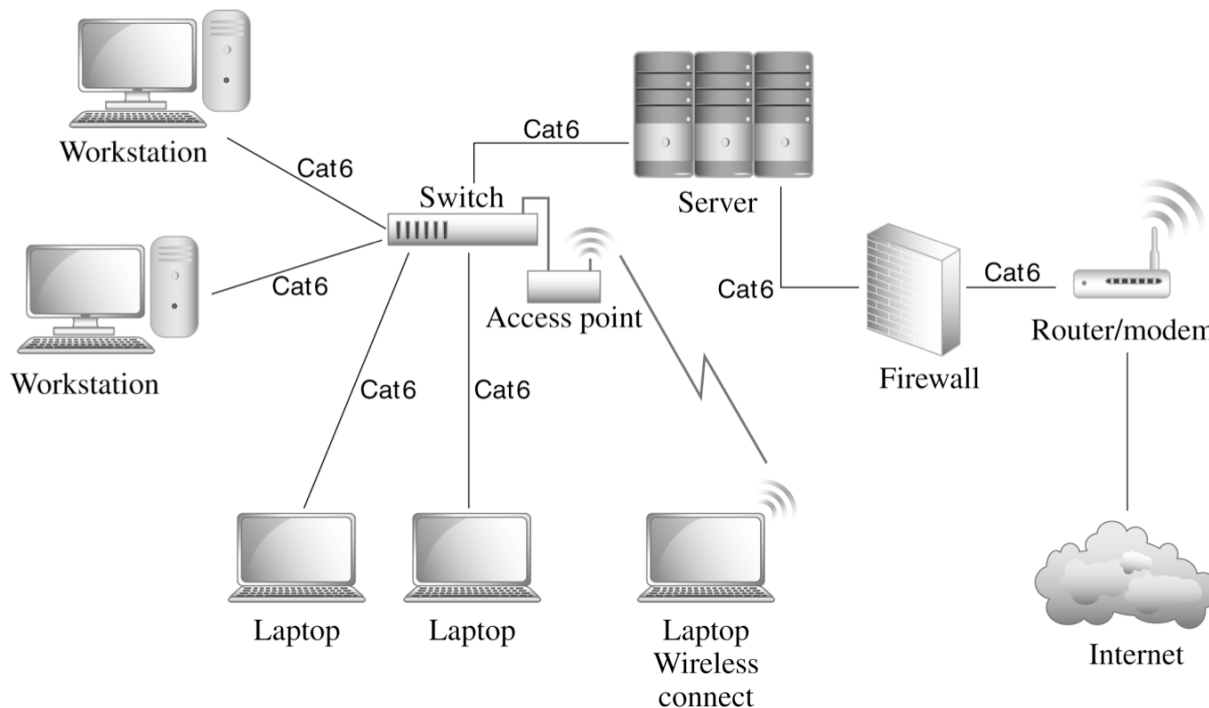
Sample answer:

Unlike an interview, a survey can be made available to many users very quickly and cost effectively. The same questions can also be asked consistently. Data can be efficiently captured without the need of an interviewer. Anonymity may also encourage more truthful responses, some users may not want to reveal their dissatisfaction fearing that they may be seen as incompetent in the use of technology. Users can also complete the survey at a time or at a location that is suitable to them without interrupting their work.

Section III

Question 27 (a)

Criteria	Marks
<ul style="list-style-type: none"> Provides a clearly labelled network diagram that fulfils the requirements of the business Includes all necessary components, and network and internet connections Provides relevant justification for the choice of components 	7
<ul style="list-style-type: none"> Provides a labelled network diagram that fulfils the requirements of the business Includes additional components for network and internet connections Provides relevant justification for the choice of most of the components 	6
<ul style="list-style-type: none"> Provides a labelled network diagram that fulfils most of the requirements of the business Includes additional components for network and internet connection Provides justification for the choice of the majority of the components 	5
<ul style="list-style-type: none"> Provides a network diagram that includes most of the business's hardware Includes additional components for network/internet connection Provides justification for the choice of some components 	4
<ul style="list-style-type: none"> Provides a basic network diagram <p>AND/OR</p> <ul style="list-style-type: none"> Identifies additional hardware component(s) and/or provides some justification for the choice of component(s) 	2–3
<ul style="list-style-type: none"> Identifies a feature of the network 	1

Sample answer:

Router/modem: Provides a connection to the internet and equal distribution of available bandwidth. Router acts as a gateway

Firewall: Provides security by only allowing protocols that the company wants on certain ports. Allows the management of access control lists. Firewall may be both hardware and software.

Server: Supplies the distribution of services such as printing and storage or the use of centralised applications.

Switch: Allows managed wired connection to the hardware that requires it, such as: workstation/server/WAP. Switches reduce risk of data packet collisions.

WAP: Provides wireless access to the network/internet for wireless devices such as laptops/printers/tablets etc

Answers could include:

- LAN v WAN
- Use of VPN
- Speed in the use of Optic Fibre – cost is high
- Reliability of RJ45 relatively cheap and easy installation
- Cabled connections are more secure from a physical attack
- Wireless protocols such as WEP or WAP required for wireless
- Ethernet required for the cable connections
- Reliability of cable vs wireless
- Internet protocols required for internet connectivity
- Flexibility of wireless over cable for moving equipment, adding devices/equipment

Question 27 (b)

Criteria	Marks
<ul style="list-style-type: none"> Provides characteristics and features of the measures that could be implemented in the scenario to protect against security intrusion Shows a thorough understanding of the security needs of the new network 	8
<ul style="list-style-type: none"> Outlines relevant measures against security intrusion providing some characteristics and/or features Shows a detailed understanding of the security needs of the new network 	7
<ul style="list-style-type: none"> Outlines relevant measures against security intrusion Shows substantial understanding of the security needs of the new network 	5–6
<ul style="list-style-type: none"> Outlines measures against security intrusion 	4
<ul style="list-style-type: none"> Identifies security measure(s) and/or security concern(s) of the new network Outlines at least one of these 	3
<ul style="list-style-type: none"> Identifies security measure(s) and/or security concern(s) of the new network OR <ul style="list-style-type: none"> Outlines a security measure or a security concern of the new network 	2
<ul style="list-style-type: none"> Identifies a security measure OR <ul style="list-style-type: none"> Shows a basic understanding of the security of the new network 	1

Sample answer:

The new network can be protected against security invasion by implementing passwords for the users and password policies. Unique passwords are important as well as implementing policies of types of passwords and how often they should be changed eg every month. This helps security so that a person who may inadvertently give away their password will have to change it regularly and to a specific password.

Using a firewall allows managed protection by only allowing access through a specific number of ports and to specified services such as the internet, email or FTP. Intrusion can be monitored and restricted by managing access to and from the computer through these specified ports. For example port 80 allows http access. Therefore any other protocol trying to gain access will not be allowed access to the computer.

Access control list can also be set to control access into and out of a network. This list can be as specific as file types.

By placing a security feature called WPA this allows you to hide the network name and provides a security key access to allow permission to the network. The network can only be accessed by an authorised user.

Answers could include:

- Share permissions
- Shared files and folders
- System files and folders
- User authentication
 - passwords
 - smart cards
 - user names
- Local users and groups
 - administration
 - power users
 - guests
 - groups
- Antivirus and malware tools
- Password policies
- Encryption
- Locking workstations
- Scheduled scans Regular and safe removal techniques
- Regular backups

Section IV

Question 28

Criteria	Marks
<ul style="list-style-type: none"> • Addresses all components of the question • Provides a cohesive well-reasoned sequenced response that reflects a high level of organisation, judgement, synthesis and problem-solving skills • Demonstrates an in-depth understanding of risk management with reference to the scenario used in the question • Consistently uses relevant industry terminology 	13–15
<ul style="list-style-type: none"> • Addresses most components of the question • Provides a reasoned sequenced response showing significant organisational and problem-solving skills • Demonstrates a detailed understanding of risk management with reference to the scenario used in the question • Uses relevant industry terminology 	10–12
<ul style="list-style-type: none"> • Addresses the majority of the components of the question • Provides a response displaying sound organisational and problem-solving skills • Demonstrates a sound understanding of risk management with some reference to the scenario used in the question • Uses some relevant industry terminology 	7–9
<ul style="list-style-type: none"> • Addresses some components of the question • Provides a response displaying some organisational and problem-solving skills • Demonstrates some understanding of risk management 	4–6
<ul style="list-style-type: none"> • Addresses at least one component of the question • Provides a response displaying basic organisation • Demonstrates a basic understanding of WHS 	1–3

Sample answer:

There are a variety of internal methods that can be used in order to gather WHS information in the workplace.

Risk management involves:

1. The identification of hazard

Hazards can be defined as any procedure or process that presents potential harm to an individual.

Types of hazards include: electricity, tools and equipment, handling goods and materials, work environment and any other human factor based hazards such as fatigue.

The organisation could use audits and/or inspections with checklists in order to identify potential hazards within the workplace.

2. Formal risk assessments

These could be conducted as audits, inspections, surveys or through meetings. Ordinarily risks are assessed using a risk assessment matrix. Hazards that are identified as risks within the workplace are rated using the matrix. An example of a matrix that could be used is seen below:

		HAZARD		
		RISK	HIGH	MEDIUM
Likelihood	Likely	RED <input checked="" type="checkbox"/>	ORANGE	YELLOW
	Unlikely	RED	YELLOW	GREEN

As an example, the hazard of exposed electrical cabling risk of injury is **HIGH** and Likelihood of injury is likely to occur. Therefore RED.

3. Controlling risks

The workplace would use the risk assessment to determine controls in order to either eliminate the risks, minimise the risks or whether to implement other controls such as administrative controls.

Using the risk matrix tool or checklists used to audit the potential hazards, the workplace could determine what controls could be implemented to change practices and procedures to eliminate risks, minimise by either substitution or modification or isolating the risk. The workplace could use the methods implemented to create other controls such as changes in policy management procedures that may also contribute to eliminating or minimising the risk.

As an example, the exposed electrical cabling could be replaced to eliminate risk.

4. Monitoring and Reviewing.

The workplace should consistently review previously assessed hazards and refer to controls and checklists used in audits in order to improve and minimise risks. A process of review should also be conducted of the procedures for auditing and inspecting. These practices need to fall in line with changes in order to maintain validity.

As an example, implement a system of yearly electrical components tagging.

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Mapping Grid

Section I

Question	Marks	HSC content – focus area	Employability skills (Please put an X where appropriate)							
			Communication	Teamwork	Problem-solving	Initiative and enterprise	Planning and organising	Self-management	Learning	Technology
1	1	3.2.4 – Operating Systems – licensing (p28)					X			X
2	1	3.1.4 – Employment – the difference between an award, agreement and contract (p24)				X				
3	1	3.3.4 – Diagnostic testing – strategies for troubleshooting (p32)	X					X		
4	1	3.1.4 – Employment – purpose and value of a code of conduct (p24)				X	X			
5	1	3.3.4 – Preventative maintenance – backup (p33)			X		X		X	X
6	1	3.4.3 – Work health and safety (WHS) – the cost of workplace injury (p36)	X			X				
7	1	3.4.3 – Risk management – risk control (p37)	X	X	X		X	X		X
8	1	3.3.4 – Destructive and malicious software – phishing (p33)			X					X
9	1	3.4.3 – Safe work practices and procedures – tagging (p38)			X	X				X
10	1	3.2.4 – Configuring an operating system – file attributes, creation, extensions and permissions (p29)			X		X			X
11	1	3.6.4 – Network and hardware installation – installation of network components (p49)			X				X	X
12	1	3.6.4 – Network and hardware testing – tools used to test the functionality of network settings and network components (p50)			X		X			X
13	1	3.6.4 – Determining requirements – design options for a SOHO network (p48)							X	X
14	1	3.6.4 – Components, protocols and standards – awareness of industry standards and protocols (p47)	X		X					X
15	1	3.6.4 – Components, protocols and standards – commonly used networking technologies and devices (p47)			X		X	X		X

Question	Marks	HSC content – focus area	Employability skills (Please put an X where appropriate)						
			Communication	Teamwork	Problem-solving	Initiative and enterprise	Planning and organising	Self-management	Learning
16	1	3.6.4 – Components, protocols and standards – awareness of industry standards and protocols (p47)					X		
17	1	3.6.4 – Components, protocols and standards – commonly used networking technologies and devices (p47)		X			X		X
18	1	3.6.4 Network security (p49)		X			X		X
19	1	3.6.4 – Network and hardware testing – how network settings are used to troubleshoot network connectivity problems (p50)	X		X	X			
20	1	3.6.4 – Network and hardware testing – characteristics of TCPIP (p50)	X				X		XX

Section II

Question	Marks	HSC content – focus area	Employability skills (Please put an X where appropriate)							
			Communication	Teamwork	Problem-solving	Initiative and enterprise	Planning and organising	Self-management	Learning	Technology
21 (a)	1	3.2.4 –Selecting an operating system – how a range of requirements can impact on the choice of an operating system (p29)			X	X			X	X
21 (b)	3	3.2.4 – Installing an operating system – configuration of power management (p29)			X				X	X
21 (c)	2	3.2.4 – Operating Systems – features and capabilities of different types of operating systems (p28)					X			X
22 (a)	2	3.4.4 – Diagnostic testing – troubleshooting (p33)		X	X					
22 (b)	3	3.3.4 – Diagnostic testing – preventative maintenance (p33)			X		X			X
23	4	3.1.4 Working with others – importance of teamwork in an ICT work environment (p26)	X	X			X			
24 (a)	2	3.6.4 – Components, protocols and standards – purpose and general characteristics of categories of internal hardware components (p47)				X			X	
24 (b)	2	3.6.4 – Components, protocols and standards – purpose and general characteristics of categories of internal hardware components (p47)		X			XX	X	X	

Question	Marks	HSC content – focus area	Employability skills (Please put an X where appropriate)							
			Communication	Teamwork	Problem-solving	Initiative and enterprise	Planning and organising	Self-management	Learning	Technology
24 (c)	4	3.6.4 – Components protocols and standards (p47)		X	X		X	X	X	
25	3	3.6.4 – Documentation – purpose and importance (p51)							X	X
26	4	3.6.4 – Network and hardware testing (p50)	X				X			X

Section III

Question	Marks	HSC content – focus area	Employability skills (Please put an X where appropriate)							
			Communication	Teamwork	Problem-solving	Initiative and enterprise	Planning and organising	Self-management	Learning	Technology
27 (a)	7	3.6.4 – Network and hardware testing – firewall (p50) 3.6.4 – Determining requirements – design options for a SOHO network (p48) 3.6.4 – Determining requirements – propose a final network (p48)	X		X		X		X	
27 (b)	8	3.5.4 – Determining requirements – factors influencing the design of a SOHO network (p48) 3.6.4 – Network and hardware installation – processes and steps involved in installation of network components (p49) 3.6.4 – Network security – potential network security intrusion symptoms and issues (p50)	X	X	X		X		X	

Section IV

Question	Marks	HSC content – focus area	Employability skills (Please put an X where appropriate)							
			Communication	Teamwork	Problem-solving	Initiative and enterprise	Planning and organising	Self-management	Learning	Technology
28	15	3.4.3 – Risk management – its application in the workplace (p37) 3.4.3 – WHS information and data – internal and external sources of WHS information and data, methods and procedures for gathering WHS information and data (p39)	X	X	X	X	X	X	X	