5220-21-022/522 Level 2 Technical Certificate in   **Digital**
Technologies – Theory Exam

Exam date: June 2019
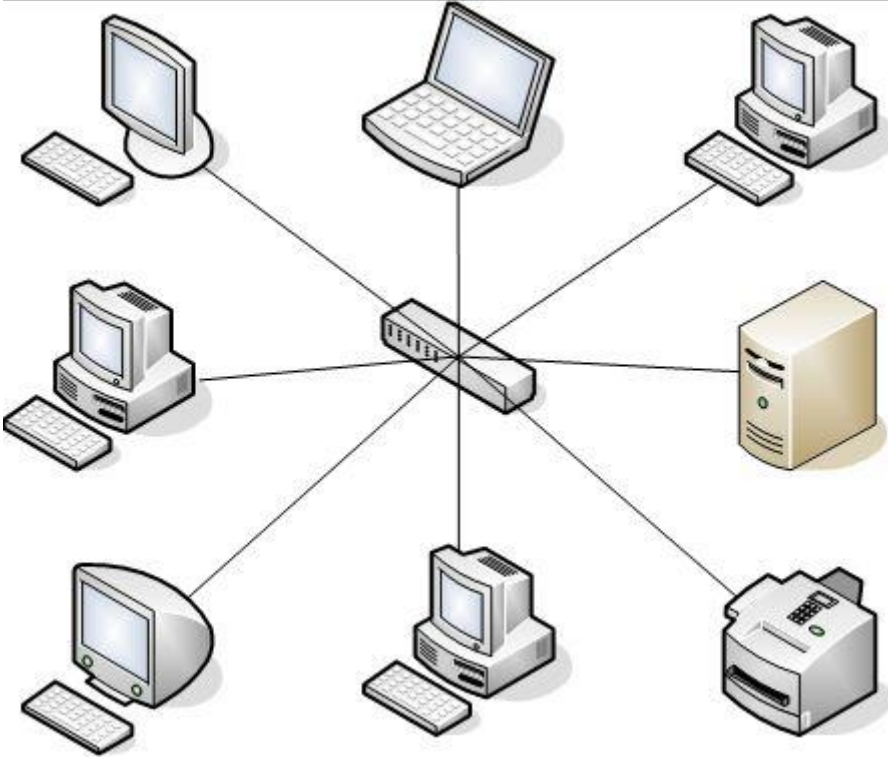
Q1	State **four** types of mobile computer systems that can be used for tasks outside an office environment.			
	Acceptable answer(s)	**Guidance**	**Max marks**	**Ref**

	1 mark each for any of the following, to a maximum of 4 marks:
	
	• laptop (1)
	• notebook (1)
	• netbook (1)
	• tablet (1)
	• smartphone (1)
		The list contains mobile computer systems from the unit specification. However, candidates may state examples that are not included in the unit. For example,
		• Wearable computer
		   o Smart watch
		   o Fitness tracker
		• Personal Digital Assistant (PDA)
		• Virtual Reality (VR) devices
		• Augmented Reality (AR) devices
		• MP3 Player
		
		Marks must not be awarded for the use of brand names to represent mobile system types. For example, iPad is not acceptable to represent tablets.
		
		Where an item is duplicated within the answers given, either by name or meaning, the duplicated item will not be awarded a mark.
		
		Marks are capped to a maximum of 1 mark for each valid item stated.
			4	**5220-022 201.1.1**

AO	AO1			
LO	201.1 Understand hardware requirements			

Q2	Explain how **each** of the following computer systems can be used in a large organisation.
	• Mainframe.
	• Desktop.

	Acceptable answer(s)	Guidance	Max marks	Ref
	2 marks each for any of the following, to a maximum of 4 marks: • <u>Mainframe</u> computers are used by large organisations to allow very high performance (1) and can perform multiple tasks (1) at the same time. • <u>Desktop</u> computers are used by individual employees (1) and can be used to store the work they do locally (1) or on a remote server.	Candidates may give very different explanations from those in the model answers, but the answers must be technically accurate. For example, candidates may give specific examples of the use of mainframe computers such as: • banking • insurance • warehousing • weather forecasting Marks should be awarded where candidates use the term workstation in place of desktop. Marks awarded are capped for each separate explanation at a total of 2 marks. Candidates should be allowed to give any valid explanation and marks should be awarded for each distinct element in the explanation. Where a point is duplicated within each explanation, by meaning, the duplicated item will not be awarded a mark.	4	5220-022 201.1.1

AO	AO2

LO	201.1 Understand hardware requirements

Q3	Explain how **each** of the following components store data that is written to them.
	• USB portable storage drive. • Digital Video Disk (DVD). • Hard Disk Drive (HDD).

	Acceptable answer(s)	Guidance	Max marks	Ref
	2 marks each for any of the following, to a maximum of 6 marks: • <u>USB portable storage drives</u> store data using flash memory (1) to store raw binary data (1) as 1s and 0s. • <u>Digital Video Disks (DVD)</u> store data using lasers (1) which burn patterns into optically sensitive material (1) to store the bits of data. • <u>Hard Disk Drives (HDD)</u> store data magnetically (1) on platters which have magnetically sensitive material (1) which can be read back to retrieve the data.	Candidates may give very different explanations from those in the model answers, but the answers must be technically accurate. Marks awarded are capped for each separate explanation at a total of 2 marks. Candidates should be allowed to give any valid explanation and marks should be awarded for each distinct element in the explanation. Where a point is duplicated within each explanation, by meaning, the duplicated item will not be awarded a mark.	6	5220-022 201.1.2

AO	AO2
LO	201.1 Understand hardware requirements

Q4	State **four** types of application software that can be used to produce documents for use in an organisation.			
	Acceptable answer(s)	**Guidance**	**Max marks**	**Ref**
	1 mark each for any of the following, to a maximum of 4 marks: • word processor (1) • presentation (1) • spreadsheet (1) • database (1) • bespoke (1)	The list contains applications. The candidate may give examples of applications that are not included in the unit. For example, • Website design software • Accounts package • Desktop publishing software Marks must not be awarded for the use of brand names to represent applications. For example, Excel is not acceptable to represent spreadsheet and PowerPoint is not acceptable to represent presentation software. Where an item is duplicated within the answers given, either by name or meaning, the duplicated item will not be awarded a mark. Marks are capped to a maximum of 1 mark for each valid item stated.	4	**5220-022 201.2.3**
AO	AO1			
LO	201.2 Understand types of software			

Q5	Explain how **each** of following network protocols can be used by software installed on an individual's computer.
	• SMTP
	• IMAP
	• POP3.

	Acceptable answer(s)	Guidance	Max marks	Ref
	2 marks each for any of the following, to a maximum of 6 marks: • <u>SMTP</u> protocol is used to send email between servers (1) and email client software (1) installed locally on the user's computer. • <u>IMAP</u> protocol is used to manage webmail messaging (1) and allows the user to view the header information (1) while leaving the message on the server. • <u>POP3</u> protocol is used to download email messages (1) from the server to email client software (1) installed locally on the user's computer.	Candidates may give very different explanations from those in the model answers, but the answers must be technically accurate. Marks awarded are capped for each separate explanation at a total of 2 marks. Candidates should be allowed to give any valid explanation and marks should be awarded for each distinct element in the explanation. Where a point is duplicated within each explanation, by meaning, the duplicated item will not be awarded a mark.	6	**5220-022 201.3.1**

AO	AO2

LO	201.3 Understand network systems

| Q6 | Explain **three** benefits of using the network topology shown in **Figure 1** in a small office network. |

Figure 1

Acceptable answer(s)	Guidance	Max marks	Ref
2 marks each for any of the following, to a maximum of 6 marks: ● Benefit 1 The <u>STAR</u> topology is based around a central device making it reliable (1) as failure of a single	Candidates may give very different explanations from those in the model answers, but the answers must be technically accurate. The candidate does not have to specifically name the topology as the STAR topology. No mark should be awarded for simply identifying the topology – the question requires valid benefits.	6	5220-022 201.3.1

	connection/device does not affect the other parts of the network (1). • Benefit 2 The STAR topology allows easy connection of additional devices (1) without affecting the rest of the network (1). • Benefit 3 The STAR topology allows filtering of traffic (1) using MAC addresses (1) when a switch is installed.	Marks awarded are capped for each separate explanation at a total of 2 marks. Candidates should be allowed to give any valid explanation and marks should be awarded for each distinct element in the explanation. Where a point is duplicated within each explanation, by meaning, the duplicated item will not be awarded a mark.
AO	AO2	
LO	201.3 Understand network systems	

Q7	List **four** technology vulnerabilities that can compromise the security of a computer system.			
	Acceptable answer(s)	**Guidance**	**Max marks**	**Ref**
	1 mark each for any of the following, to a maximum of 4 marks: • unpatched internet browsers (1) • inappropriate file sharing (1) • unsecure social networking accounts (1) • loss of mobile data storage (1)	The list contains vulnerabilities. The candidate may give examples of vulnerabilities that are not included in the unit. For example, • damaged hardware • misconfigured software • misconfigured active directory/LDAP • allowing automatic updates • Lack of Anti-Virus • Lack of Firewall Where an item is duplicated within the answers given, either by name or meaning, the duplicated item will not be awarded a mark. Marks are capped to a maximum of 1 mark for each valid item listed.	4	**5220-022 202.1.3**
AO	AO1			
LO	202.1 Understand Cyber security threats and vulnerabilities			

Q8	Explain how the security of a computer system can be compromised by **each** of the following software vulnerabilities. • Backdoor entry. • Upgrades.			
	Acceptable answer(s)	**Guidance**	**Max marks**	**Ref**
	2 marks each for any of the following, to a maximum of 4 marks: A system can be compromised by: • the introduction of a <u>backdoor entry</u> through the installation of software (1) that has been designed to compromise the security of the port used for the backdoor (1). • installation of <u>upgrades</u> which can inadvertently change security settings (1) or provide new opportunities that can be exploited by hackers (1).	Candidates may give very different explanations from those in the model answers, but the answers must be technically accurate. Marks awarded are capped for each separate explanation at a total of 2 marks. Candidates should be allowed to give any valid explanation and marks should be awarded for each distinct element in the explanation. Where a point is duplicated within each explanation, by meaning, the duplicated item will not be awarded a mark.	4	5220-022 202.1.3
AO	AO2			
LO	202.1 Understand Cyber security threats and vulnerabilities			

Q9	Describe how an administrator can use the following methods to reduce the risk of the security of IT systems being compromised.
	• Update software. • Manage user access rights. • Removable media control.

	Acceptable answer(s)	Guidance	Max marks	Ref
	2 marks each for any of the following, to a maximum of 6 marks: The administrator can: • <u>update software</u> to reduce risk when notified of updates by the software authors (1) that address known security vulnerabilities (1) and reduce the risk of its effect. • <u>manage user access rights</u> to reduce the risk of unauthorised users accessing the system (1) and damaging the system or its data (1). • control the use of <u>removable media</u> to reduce the risk of users introducing threats from outside the system (1) or taking data from the system without permission (1).	Candidates may give very different descriptions from those in the model answers, but the answers must be technically accurate. Marks awarded are capped for each separate description at a total of 2 marks. Candidates should be allowed to give any valid description and marks should be awarded for each distinct element in the description. Where a point is duplicated within each description, by meaning, the duplicated item will not be awarded a mark.	**6**	**5220-022 202.2.1**

AO	AO2

LO	202.2 Understand Cyber security protection measures

Q10	Identify **two** reasons why data would be routinely backed up by an organisation.			
	Acceptable answer(s)	**Guidance**	**Max marks**	**Ref**
	1 mark each for any of the following, to a maximum of 2 marks: • data integrity (1) • business continuity (1) • comply with legislation (1)	The list contains reasons for backing up data. The candidate may give examples of reasons for backing up data that are not included in the unit. For example, • auditing and accountability • sharing with other systems • version control • to enable systems to be restored Where an item is duplicated within the answers given, either by name or meaning, the duplicated item will not be awarded a mark. Marks are capped to a maximum of 1 mark for each valid item stated.	**2**	**5220-022 202.3.1**
AO	AO1			
LO	202.3 Understand the backup process			

Q11	Describe why an administrator may use the following tools to support an effective backup strategy.
	• Operating system utilities.
	• File transfer protocol.
	• Cloud backup.

	Acceptable answer(s)	Guidance	Max marks	Ref
	2 marks each for any of the following, to a maximum of 6 marks: An administrator may use the tools because: • <u>operating system utilities</u> require no additional software installation (1) with the utility being optimised for working with the operating system (1). • <u>file transfer protocol (ftp)</u> is effective for the secure transfer of large amounts of data directly to another system (1) without having to be in the same location as the other system (1). • <u>Cloud backup</u> provides a convenient way of getting access to large storage capacity without having to buy hardware (1) and provides the additional protection of being off-site (1).	Candidates may give very different descriptions from those in the model answers, but the answers must be technically accurate. Marks awarded are capped for each separate description at a total of 2 marks. Candidates should be allowed to give any valid description and marks should be awarded for each distinct element in the description. Where a point is duplicated within each description, by meaning, the duplicated item will not be awarded a mark.	6	**5220-022 202.3.2**

AO	AO2

LO	202.3 Understand the backup process

Q12	State **four** procedures that can be carried out by a helpdesk to support users.			

	Acceptable answer(s)	Guidance	Max marks	Ref
	1 mark each for any of the following, to a maximum of 4 marks: • customer service (1) • fault reporting (1) • authorisation (1) • escalation (1) • quality assurance (1)	The list contains procedures. The candidate may give examples of procedures that are not included in the unit. For example, • arranging refunds • managing product delivery • issue tracking • ask/answer questions • provide support through email • return phone calls Where an item is duplicated within the answers given, either by name or meaning, the duplicated item will not be awarded a mark. Marks are capped to a maximum of 1 mark for each valid item stated.	4	**5220-022 203.1.2**
AO	AO1			
LO	203.1 Understand the support process			

Q13	Describe how a support team can use the following interactions to identify the cause of a problem being reported by an end user. • Open questions. • Closed questions. • Emails.			
	Acceptable answer(s)	**Guidance**	**Max marks**	**Ref**
	2 marks each for any of the following, to a maximum of 6 marks: The support team can use: • open questions to identify issues indirectly associated with the symptoms being reported (1) but which may be relevant to the fault and help with its identification (1) and resolution. • closed questions as a pre-defined checklist (1) that allow the confirmation of the operation of fundamental parts of a system (1) to eliminate them from the possible causes of the problem. • emails to make information available to different specialist members of the team (1) and inform the user of progress (1).	Candidates may give very different descriptions from those in the model answers, but the answers must be technically accurate. Marks awarded are capped for each separate description at a total of 2 marks. Candidates should be allowed to give any valid description and marks should be awarded for each distinct element in the description. Where a point is duplicated within each description, by meaning, the duplicated item will not be awarded a mark.	6	**5220-022 203.2.1**
AO	AO2			
LO	203.2 Support end users			

Q14	A local animal rescue charity has asked for a networked office computer system to handle its administration processes when dealing with its clients. You have been asked to report on the provision of the hardware for the system.
	They have three office-based staff and one who works out of the office to complete inspection visits. The system must be able to cope with a planned future increase of staff and it must allow everyone to share files and use a single printer.
	Discuss what can be included in your report, describing how the proposed system can be implemented.

	Acceptable answer(s)	Guidance	Max marks	Ref

	Indicative content:
	A candidate's discussion may include consideration of:
	• Planning
	    ○ Life cycle models
	    ○ Sourcing
	        ▪ budget
	        ▪ availability
	    ○ PC Hardware
	        ▪ PC specification
	    ○ Networks
	        ▪ topologies
	        ▪ hardware
	        ▪ connection media
	        ▪ connection devices
	        ▪ cellular access
	    ○ User requirements
	        ▪ target platform
	        ▪ system constraints
	    ○ Legislation and regulations
	    ○ Compliance
	• Design
	    ○ Skill requirements
	        ▪ users
	    ○ Development timescales
	    ○ Data requirements
		0 marks – No awardable material
		
		Band 1:
		1– 3 marks
		The response demonstrates a limited understanding of the processes and technologies involved and is mostly a statement of facts which are not developed. The approach to the task is inconsistent. Statements may be occasionally incorrect, and the use of precise technical language is sparse.
		
		Band 2:
		4 – 6 marks
		The candidate has produced a discussion that expands on the factual knowledge but lacks detail in some areas. They show an adequate understanding of the processes and technologies involved including some reasons for their selection. They have provided some valid reasons for their choices. The response is structured and presented in a logical order representing the sequences of processes that would be carried out during development.
		
		Band 3:
		7 – 9 marks
			9	5220-022
				AO4

	- o Data storage - o Security ▪ Threats ▪ Vulnerabilities ▪ Risks ▪ Data ▪ Countermeasures ▪ backup strategies - o Hardware - o Networks • Implementation - o project planning - o access to premises - o security of premises - o backup procedures • Testing - o test plan - o test log - o user acceptance schedules • Deployment - o user acceptance tests - o handover processes • Maintenance - o Technical documentation - o Security - o User support - o Accounts - o Fault log	The candidate has shown a thorough understanding of the processes and technologies involved. They have covered these in a logical order, including reasons behind the processes and technologies, the factors that need to be considered and the impact these factors may have on the implementation. They have clearly understood how all of the processes and technologies link to one another in terms of order and importance. They have provided valid reasons for their choices. The response is clear, coherent and all information has been logically presented.		
AO	Integration			
LO	**201 1.1, 1.2, 2.1, 2.3, 4.1, 4.2, 5.1** **202 1.2, 1.3, 2.1, 2.2, 3.1, 3.2, 3.3** **203 1.1, 1.2, 1.3, 2.1, 2.2, 3.1**			

Q15	The animal charity has accepted the proposals for the networked system as specified in Question 14.
	This must be fully installed and configured with relevant software to allow the: • production of marketing materials • sending and receipt of e-mails • management of their financial accounts. They also require ongoing user support and guidance for a period of two years. Discuss the software requirements for the proposed system, making recommendations to meet their needs.

Acceptable answer(s)	Guidance	Max marks	Ref

Indicative content:
A candidate's discussion may include consideration of:
• Planning
  o Life cycle models
  o Sourcing
    ▪ budget
    ▪ availability
    ▪ lead time
  o PC Hardware
    ▪ minimum specification for software
    ▪ recommended specification for software
  o Software
    ▪ Applications
    ▪ Operating systems
    ▪ Security software
    ▪ Firewalls
  o Networks
    ▪ VPN
    ▪ remote access
    ▪ protocols
    ▪ rights and permissions
    ▪ cellular access access cellular access
	0 marks – No awardable material
	
	Band 1:
	1– 3 marks
	The response demonstrates a limited understanding of the processes and technologies involved and is mostly a statement of facts, which are not developed. The approach to the task is inconsistent. Statements may be occasionally incorrect, and the use of precise technical language is sparse.
	
	Band 2:
	4 – 6 marks
	The candidate has produced a discussion that expands on the factual knowledge but lacks detail in some areas. They show an adequate understanding of the processes and technologies involved including some reasons for their selection. They have provided some valid reasons for their choices. The response is structured and presented in a logical order representing the sequences of processes that would be carried out during development.
		9	5220-022
			AO4

- o User requirements
  - target platform
  - system constraints
- o Legislation and regulations
- o Compliance
- Design
  - o Skill requirements
    - users
  - o Data requirements
  - o Data storage
  - o Security
    - Threats
    - Vulnerabilities
    - Risks
    - Data
    - Countermeasures
- Implementation
  - o project planning
  - o access to PCs for software installation
  - o security of accounts for users
  - o security of the network
- Testing
  - o test plan
  - o test log
  - o user acceptance schedules
- Deployment
  - o user acceptance tests
  - o handover processes
- Maintenance
  - o Technical documentation
  - o Security
  - o User support
  - o Accounts
  - o Fault log

Band 3:

7 – 9 marks

The candidate has shown a thorough understanding of the processes and technologies involved. They have covered these in a logical order, including reasons behind the processes and technologies, the factors that need to be considered and the impact these factors may have on the implementation. They have clearly understood how all of the processes and technologies link to one another in terms of order and importance. They have provided valid reasons for their choices. The response is clear, coherent and all information has been logically presented.

AO	Integration
LO	AO4 Integration