

Computer Application Technology (CAT)

THEORY STUDY GUIDE



GAUTENG PROVINCE

EDUCATION
REPUBLIC OF SOUTH AFRICA



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Computer Application Theory Study Guide

Introduction

This study guide covers selected parts of the different theory topics of the CAPS Grade 12 Computer Applications Technology (CAT) curriculum in the order they usually appear in the NSC final examination. The study guide does NOT cover the entire CAPS curriculum, but it does focus on core content of each knowledge area, that is, Systems Technologies, Network Technologies, Internet Technologies, Information Management and Solution Development (Theory)

You must work your way through this study guide to improve your understanding, identify your areas of weakness and correct your own mistakes. To ensure a high-quality pass, you should also cover the remaining parts of the curriculum using other textbooks, latest examination guidelines, past NSC examination question papers and the Annual Teaching Plan (Grade 10 – 12). It is important to note that content from Grade 10, 11 and 12 will be examined in the final NSC examination.

How to use this study Guide

The selected parts of each topic are presented in the following way:

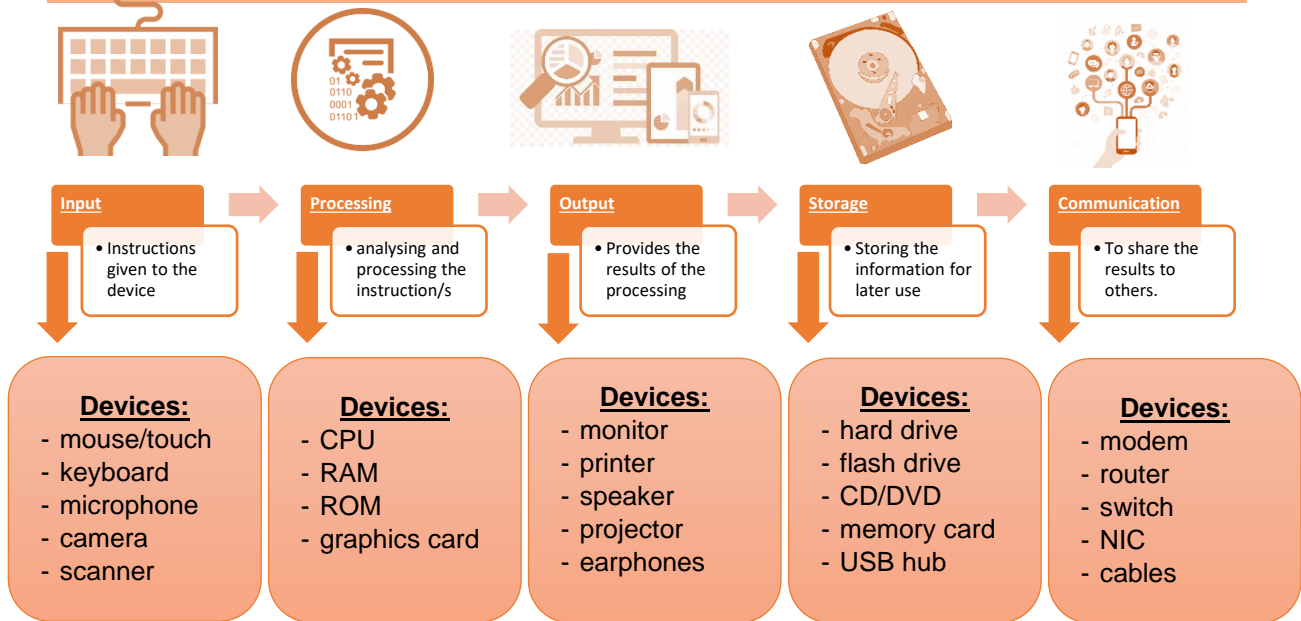
- A summary of terms and concepts for each theoretical topic.
- There are QR codes on topics for further information. Scan QR code with your mobile devices for further information.
- Activities with questions for you to answer. The activities are based on exam-type questions. Complete the activities on your own then check your answers.
- Questions and Activities should be completed in your theory books as informal assessments.
- Questions from past NSC final examinations for you to answer. Complete the NSC questions on your own, then check your answers.

Summary of Systems Technology

Hardware

Hardware devices are the tangible parts of the computer, i.e. the parts we can see and touch. Various devices are considered as hardware and can be divided into: Input, processing, output, storage and communication devices.

Information Processing Cycle



More about Input



- Various devices for input can be used to insert data more productively.
- If one of the input modes fail, another can be used.
- More input modes provides better security.

Keylogging:

Records every keystroke on a keyboard. Hackers could install keyloggers in attempt to steal usernames, password or pin numbers.



Convergence:
When different technologies are merged into one device.



Reasons why we use computers/computing devices

Why do we use computers?

To save and be productive

- **Saving paper:** send data electronically
- **Saving time:** faster to create and send information
- **Saving labour:** can perform jobs that humans cannot - complex calculations(24/7)
- **Saving costs:** VoIP/email/IM are cheaper than conventional methods such as phone calls.

To be efficient, accurate & reliability

- **GIGO:** Garbage In Garbage Out – refers to inaccurate input provides an inaccurate result.
- **Data validation:** computers allow users to enter data more efficiently and accurately.

To have effective time and distance

- **Distance:** regardless of where you are you can communicate with anyone in the world
- **Time:** You can instantly communicate with anyone without having to wait

To be able to communicate globally

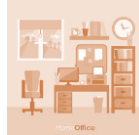
- **Social Networking:** Can link to anyone around the world (Facebook, Twitter, Instagram)
- **Web tools:** functions and features that helps users:
 - **Blogs/Vlogs:** Online type of dairy.
 - **Wiki's:** allows user to create, edit or remove content from a webpage
 - **RSS feeds:** updates from various sources (blogs, websites) to one central place (email)
 - **Web 2.0:** allows users to collaborate and share information

Types of computer users



Personal

- Can perform a wide range of tasks
- Cheap to buy
- Uses basic input and output devices



SOHO

- Single Office/ Home Office
- Using computers & printers in a network



Mobile

- Designed for portable users
- Tablets, phablets, smartphones, laptops



Power

- Higher specs needed for applications
- Expensive to buy
- More RAM, CPU and storage needed



Enterprise

- Companies that have many users over the country
- Uses a large network to connect

Specifications

Processing:

- Entry level CPU & RAM

Input:

- Mouse/Keyboard

Output:

- Monitor/Printer

Storage:

- HDD/CD/DVD

Communication:

- Modem

Processing:

- Higher CPU & RAM

Input:

- Mouse/Keyboard /Scanner

Output:

- Monitor/Multi-Functional Printer

Storage:

- HDD/CD/DVD /Flash

Communication:

- Modem/Router

Processing:

- Mobile CPU & RAM

Input:

- Integrated Touchscreen

Output:

- Integrated speaker

Storage:

- HDD/SD-Card

Communication:

- 3G/4G/LTE

Processing:

- High-end CPU & larger RAM

Input:

- Mouse/Keyboard /Scanner

Output:

- High quality Monitor, Printer/Speakers

Storage:

- HDD/Flash /External HDD

Communication:

- Modem/Router

Processing:

- Higher CPU & RAM speed

Input:

- Keyboard /barcode scanner

Output:

- Monitor/Printer

Storage:


- Network HDD

Communication:






- Router

Specifications of hardware devices (making buying decisions)

When making buying decisions it is important to consider the type of computer according to the need and purpose of the device/s, i.e. the type of computer user.


Device	Specs	Description					
MOTHERBOARD CIRCUIT/PROCESSING							
<p>Personal computer/SOHO user</p> <p>Dual Core i3 1.7 GHz CPU 4 GB DDR3, 1 333 MHz RAM 500 GB hard drive 2 GB integrated HD graphics card Multi-DVD writer USB 3.0 802.11 a/b/g 2 MP webcam 19" LCD monitor Windows 7 Wireless Keyboard/Mouse</p> 	CPU	<ul style="list-style-type: none"> - Measured in GHz (1.7 GHz) or (3.2 Ghz) - Refers to the SPEED of processing - Core, Dual core(X2), Quad Core(X4) 					
	RAM	<ul style="list-style-type: none"> - Measured in GB (4 GB) or (6 GB) - Temporary memory – volatile (power ON) 					
	Graphics Card	<ul style="list-style-type: none"> - Measured in GB - Display adapter for higher quality images - GPU provides processing for images 					
	Optical Drive	<ul style="list-style-type: none"> - Measured in MB/GB (Small capacity) - DVD, CD, Blu-Ray 					
	USB/Firewire port	<ul style="list-style-type: none"> - 3.0 refers to the speed of reading the device - Firewire faster than USB 					
	Multi-card reader	<ul style="list-style-type: none"> - Able to read a variety of memory cards - SDCard, Micro SDCard, Card Adapter 					
	Connection	<ul style="list-style-type: none"> - 802.11 refers to specifications and protocols for a wireless network - a/b/g/(n) refers to the versions of speed 					
	Webcam	<ul style="list-style-type: none"> - Measured in MP (Mega Pixels) <table border="1"> <thead> <tr> <th>Advantages</th> <th>Disadvantages</th> </tr> </thead> <tbody> <tr> <td> <ul style="list-style-type: none"> - Cheaper than digital camera - Non-verbal cues can be seen </td> <td> <ul style="list-style-type: none"> - Low resolution - Poor connection can delay video </td> </tr> </tbody> </table>		Advantages	Disadvantages	<ul style="list-style-type: none"> - Cheaper than digital camera - Non-verbal cues can be seen 	<ul style="list-style-type: none"> - Low resolution - Poor connection can delay video
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Wireless Keyboard/Mouse	<ul style="list-style-type: none"> - Ergonomics: equipment designed for health and comfort of the user <table border="1"> <thead> <tr> <th>Advantages</th> <th>Disadvantages</th> </tr> </thead> <tbody> <tr> <td> <ul style="list-style-type: none"> - No clutter of cables - Creates more space - Can move further from computer </td> <td> <ul style="list-style-type: none"> - Costly: uses batteries - Connection could be lost </td> </tr> </tbody> </table>		Advantages	Disadvantages	<ul style="list-style-type: none"> - No clutter of cables - Creates more space - Can move further from computer 	<ul style="list-style-type: none"> - Costly: uses batteries - Connection could be lost 	
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STORAGE							
<p>CAPACITY</p> <p>8 bits = 1 byte 1024 bytes = 1 kilobyte (kb) 1024 kilobyte = 1 megabyte (MB) 1024 megabytes = 1 gigabyte (GB) 1024 gigabytes = 1 terabyte (TB)</p>	Hard drive	<ul style="list-style-type: none"> - Capacity various from 500 GB to 2 TB - Permanent memory – non-volatile <table border="1"> <thead> <tr> <th>SSD (Solid-State Drive)</th> <th>HDD (Hard Disk Drive)</th> </tr> </thead> <tbody> <tr> <td> <ul style="list-style-type: none"> - More expensive - Faster than HDD - More durable </td> <td> <ul style="list-style-type: none"> - Cheaper than SDD - Slower than SDD - Easily damaged </td> </tr> </tbody> </table>	SSD (Solid-State Drive)	HDD (Hard Disk Drive)	<ul style="list-style-type: none"> - More expensive - Faster than HDD - More durable 	<ul style="list-style-type: none"> - Cheaper than SDD - Slower than SDD - Easily damaged 	
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	Flash disk	<ul style="list-style-type: none"> - Capacity various from 4 GB to 128 GB - More durable than CD/DVD 					
	DVD/CD	<ul style="list-style-type: none"> - Capacity DVD (4,7 GB) / CD (700 MB) - Easily damaged/scratched 					
	Memory card	<ul style="list-style-type: none"> - Capacity various from 4 GB to 64 GB - Used in mobile devices (phone/camera) 					
	Cloud storage	<ul style="list-style-type: none"> - Allows users to save on the internet <table border="1"> <thead> <tr> <th>Advantage</th> <th>Disadvantage</th> </tr> </thead> <tbody> <tr> <td> <ul style="list-style-type: none"> - Mostly free - Retrieve data from anywhere </td> <td> <ul style="list-style-type: none"> - Needs internet - Not secure </td> </tr> </tbody> </table>		Advantage	Disadvantage	<ul style="list-style-type: none"> - Mostly free - Retrieve data from anywhere 	<ul style="list-style-type: none"> - Needs internet - Not secure
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A **BACKUP** is a **copy** of data, files or software saved on a different storage medium and kept off-site from the original information. If the original data gets lots/damaged it can be restored.

Device	Specs	Description	
MONITORS/SCREENS			
	Types	<ul style="list-style-type: none"> - LCD (liquid crystal display) - LED (light-emitting diodes) - Touchscreens - LCD & LED screen uses less electricity. 	
	Size	<ul style="list-style-type: none"> - Measured in inches (19") or (23) - Diagonally from one corner to the opposite corner 	
	Resolution	<ul style="list-style-type: none"> - Measured in pixels (1920 X 1080) - Number of pixels vertical X horizontal - Determines the quality of the image 	
	High Quality Resolution	Advantages	Disadvantages
		<ul style="list-style-type: none"> - Larger picture size - Clear and sharp - Better crop options 	<ul style="list-style-type: none"> - Requires high quality lens - Larger file sizes
	Aspect ratio	<ul style="list-style-type: none"> - Common ratios are 4:3/16:9 - Relationship between width X height 	
	Response time	<ul style="list-style-type: none"> - Measured in ms (milliseconds) - Time to shift from one colour to another 	
	Refresh rate	<ul style="list-style-type: none"> - Number of times your monitor updates with new images 	
	Contrast ratio	<ul style="list-style-type: none"> - Common ratio is 1000:1 - Ratio of the darkest vs brightest colours 	
	Colour depth	<ul style="list-style-type: none"> - Measured in 32-bit/64-bit - Refers to the number of bits per pixel 	
	Connections	VGA	HDMI
		 <ul style="list-style-type: none"> - Video only - Poor quality 	 <ul style="list-style-type: none"> - Both audio & video - High quality
PRINTERS			
<p style="text-align: center;">Inkjet / Laser / Multi-Function</p>  <p style="text-align: center;">3D Printer</p> 	Types	Inkjet	Laser
	Cost	<ul style="list-style-type: none"> - Expensive to buy - Ink cartridges are cheaper - Cost per page is expensive 	<ul style="list-style-type: none"> - Cheaper to buy - Toner is more expensive - Cost per page is cheaper
	Resolution	<ul style="list-style-type: none"> - Measured in DPI (dots per inch) 	
	Speed	<ul style="list-style-type: none"> - Slow printing 	<ul style="list-style-type: none"> - Fast printing
	Colour	<ul style="list-style-type: none"> - Uses ink cartridges - Usually used for colour printing 	<ul style="list-style-type: none"> - Uses toner - Usually monochrome
	Paper options	<ul style="list-style-type: none"> - Sizes: A4, A3, A2 - Types: glossy, matte, cardboard 	
	Printing Capacity	<ul style="list-style-type: none"> - Refers to the number of sheets that can be inserted in the paper tray (250 sheets) 	
	Functions	<ul style="list-style-type: none"> - Multi-functional printer: scan, fax, copy 	
	Connection Options	<ul style="list-style-type: none"> - Wireless (Bluetooth/Wi-Fi) - Wired (USB/Ethernet) 	
	System compatibility	<ul style="list-style-type: none"> - Refers to the capacity that the printer and the hardware/software should have to function 	
	3D Printer	<ul style="list-style-type: none"> - Creates 3 dimensional solid objects by adding consecutive layers of material on top of each other 	

Ensure environmentally friendly use of printer

- Do not throw cartridges/toner away as they are toxic
- Instead refill and re-use them
- Print both sides of the paper
- Print two pages on 1
- Used recycled paper
- Avoid printing – send email instead
- Print in draft mode to reduce ink usage

Device	Specs	Description				
SCANNERS						
	Scanner	<p>Flatbed/Sheet Feed:</p> <ul style="list-style-type: none"> - Scans hard copies to soft copies (as images) - Need OCR software to convert scanned images into editable document. <table border="1"> <thead> <tr> <th>Advantages</th> <th>Disadvantages</th> </tr> </thead> <tbody> <tr> <td>- Images can be shared</td> <td>- Needs to be high quality</td> </tr> </tbody> </table>	Advantages	Disadvantages	- Images can be shared	- Needs to be high quality
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	- Images can be shared	- Needs to be high quality				
	Biometric	<ul style="list-style-type: none"> - Uses unique body features to access a device, i.e. acts as a password. - Features include: fingerprint, face, voice <table border="1"> <thead> <tr> <th>Advantages</th> <th>Disadvantages</th> </tr> </thead> <tbody> <tr> <td>- More secure – not easy to hack - Cannot be lost or forgotten</td> <td>- Cannot access if feature is damaged - Expensive to set up</td> </tr> </tbody> </table>	Advantages	Disadvantages	- More secure – not easy to hack - Cannot be lost or forgotten	- Cannot access if feature is damaged - Expensive to set up
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	Barcode	<ul style="list-style-type: none"> - Reads the code of a product <table border="1"> <thead> <tr> <th>Advantages</th> <th>Disadvantages</th> </tr> </thead> <tbody> <tr> <td>- More accurate - Faster service - Easy to manage stock</td> <td>- Scan from close proximity - Damaged barcode won't scan</td> </tr> </tbody> </table>	Advantages	Disadvantages	- More accurate - Faster service - Easy to manage stock	- Scan from close proximity - Damaged barcode won't scan
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	QR Codes	<p>Quick Response:</p> <ul style="list-style-type: none"> - Uses a camera and OCR technology to decode - Grouping of black and white squares - 2D barcode (matrix barcode) - Can be used as a shortcut to a website or a link to make a payment 				
RFID	<p>Radio Frequency Identification:</p> <ul style="list-style-type: none"> - Transmits digital data through a receiver and transmitter. <table border="1"> <thead> <tr> <th>Advantages</th> <th>Disadvantages</th> </tr> </thead> <tbody> <tr> <td>- High speed - High accuracy - Multiple reading</td> <td>- Interference - High cost - Fail to read</td> </tr> </tbody> </table>	Advantages	Disadvantages	- High speed - High accuracy - Multiple reading	- Interference - High cost - Fail to read	
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NFC	<p>Near Field Communication:</p> <ul style="list-style-type: none"> - A standard that allows devices to connect wireless by bringing them closer to each other, e.g. sharing files between smartphones. <table border="1"> <thead> <tr> <th>Advantages</th> <th>Disadvantages</th> </tr> </thead> <tbody> <tr> <td>- Power efficient - Measure of security: data can only be collected in proximity</td> <td>- Not all devices have NCF - Devices need to be very close to collect data</td> </tr> </tbody> </table>	Advantages	Disadvantages	- Power efficient - Measure of security: data can only be collected in proximity	- Not all devices have NCF - Devices need to be very close to collect data	
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- Power efficient - Measure of security: data can only be collected in proximity	- Not all devices have NCF - Devices need to be very close to collect data					
Magnetic readers	<ul style="list-style-type: none"> - Reads the information on the magnetic stripe located on the back of a card. 					

How to fix ordinary problems

Ordinary problems	Problem	Solution
Application issues	<ul style="list-style-type: none"> - App icon missing: files do not open - Application not running: <ul style="list-style-type: none"> * Not enough RAM * Virus infection * Thrashing: swapping between apps 	<ul style="list-style-type: none"> - Open with: search for applicable app * Add more RAM/Close some apps * Scan computer with anti-virus * Close all files and retry
Mouse is not working	<ul style="list-style-type: none"> - Mouse is slow or not responding - Mouse not moving at all 	<ul style="list-style-type: none"> - Battery could be flat - Could be wrong surface: glass
Scanning problems	<ul style="list-style-type: none"> - Edges of the document not scanned - Colours looking wrong - OCR app doesn't recognise text - File is too large 	<ul style="list-style-type: none"> - Reposition document - Select correct colour profile - Increase scanning resolution - Decrease dpi/resolution
Resolution issues	<ul style="list-style-type: none"> - Screen not displaying correctly 	<ul style="list-style-type: none"> - Set the resolution to fit the screen
Printing problems	<ul style="list-style-type: none"> - Printer not switching on - Paper jam - Printer not available - Printer doesn't print - Network printer problem 	<ul style="list-style-type: none"> - Check power cable - Remove paper jam - Check driver OR USB connection - Check ink/toner - Check network connections
Disk-errors	<ul style="list-style-type: none"> - Fragmentation of files: when files are scattered on HDD). This slows down the computer 	<ul style="list-style-type: none"> - Defragmentation is when files are rearranged to be in sequential clusters. DOES NOT FREE UP SPACE
Non-responding apps	<ul style="list-style-type: none"> - When an application has stopped working and is not responding 	<ul style="list-style-type: none"> - Open the Task Manager (Ctrl+Alt+Del), select the app and End Task

How to check for free space on storage device



Factors influencing a computers performance

RAM	<ul style="list-style-type: none"> - RAM is faster than secondary storage - More RAM means faster access to data
Processors	<ul style="list-style-type: none"> - CPU has a great influence on the speed of the computer - Higher CPU speed will increase the computers speed
Number of applications running	<ul style="list-style-type: none"> - If there are too many apps running, system resources are shared and this will slow down the computer
Caching	<ul style="list-style-type: none"> - When a small part of RAM is used to access data faster - Data that is used often is stored in the cache - Web caching saves often opened websites to retrieve faster - Disk caching saves pieces of files for faster access
Disk space and speed	<ul style="list-style-type: none"> - Disk space doesn't influence the speed, but there should be enough space for temporary files
Malware	<ul style="list-style-type: none"> - Software designed to be malicious and disrupt the normal functioning of the computer <p>Types:</p> <ul style="list-style-type: none"> - Virus: attached to a file - Worm: copies itself without user intervention - Trojan: Presents itself as a harmless app - Rootkit: Hidden in the system files

Software

Software is a set of instructions, data or programs used by computer to perform specific tasks and for a user to interact with a device. Software is typically divided into two main categories: system software and application software.

System Software

System software is a set of programs that control and manage the operations of a computer.

Feature	Description
OPERATING SYSTEM	
Function	<ul style="list-style-type: none"> - Allows communication between the hardware, system programs and the user - Controls hardware and software - Runs/manages applications (via file extensions) - Provides the user with an interface (GUI): icons, buttons, tabs and drop-down lists
Managing applications	<ul style="list-style-type: none"> - Control between single user and multi user - Controls multitasking - Provides the Task Manager - Management of files - File types and properties
Examples	<ul style="list-style-type: none"> - MS Windows - Linux - Mac OS - Apple iOS - Android
DRIVERS	
Function	<ul style="list-style-type: none"> - Small programs that acts as a translator between the operating system and hardware devices - Providing communication between the hardware device and the computer
Examples	<ul style="list-style-type: none"> - Soundcard - Display card - Network card - Printer
UTILITIES	
Function	- Designed to analyse, maintain, configure and improve a computer
Examples	
File management	<ul style="list-style-type: none"> - Managing files and folders by creating, copying and searching - Importing/Exporting and even conversion of files
Updates	<ul style="list-style-type: none"> - Updates are important as it keeps newest features available - Scheduled updates will run automatically (in case a user forgets to make updates)
Disk clean-up	- To clean the hard drive from all the temporary files that are not in use
Defragmentation	- To rearrange fragments of files that are scattered on the hard drive
File compression	- Allows a user to reduce the size of a file – "Zip"
Backups	- A copy of data, files or software saved on a different storage medium and kept off-site on a different location. If the original data gets lots/damaged it can be restored
Coordinate tasks	<ul style="list-style-type: none"> - Tasks are coordinated in order for problems not to occur. - FIFO (First In First Out), i.e. printing jobs are send to the print spooler and are queued in the order it was sent
Control security	<ul style="list-style-type: none"> - Firewall: hardware or software that stops unauthorized access to the computer. - Access control: usernames and passwords - Anti-malware: prevents malware like spyware, viruses, worms and Trojans. - Adware Blocker: Blocks adds that are part of software.
Anti-virus	<ul style="list-style-type: none"> - Software designed to stop viruses from entering the system - Scanning removable devices, email attachment and websites for viruses. e.g. Avast!; Bitdefender

File Types
File extensions determine the type of file (e.g. docx; mp3)

File Properties
Indicate the size of a file.
Attributes: Read-only/Hidden

Metadata
Additional information of a file.
(e.g. Author, Title, Location)

Application Software

Application Software is created in dealing with user input to help the user perform a specific task.

Description	Examples
PRACTICAL APPLICATION	
- Applications used to create, edit and design information.	- Word processor, Spreadsheet, Database, Presentation - Photoshop
REFERENCING SOFTWARE	
- Instead of using printed materials such as books, dictionaries, encyclopaedia's	- Google Earth - Wikipedia - Google Translate' - Babylon dictionary
COMMUNICATION SOFTWARE	
- Software used to communicate with anyone anywhere.	- Skype - WhatsApp - Facebook - Email, etc.
DOCUMENT MANAGING SOFTWARE	
- An application used to manage and store documents. - Functions include: Storage, Searching, Indexing	- Windows Explorer - eFileCabinet
WEB BROWSERS	
- An application used to access websites	- Edge - Mozilla Firefox - Google Chrome - Opera Mini

Software that enhances productivity, efficiency and accessibility

Using specific software applications can help to be more efficient and productive. The following are examples of these software:

Voice recognition	Allows a computer to recognise spoken words: - For disabled users - Typing a document with speech Advantages: - Natural input method - Relatively cheap, no special hardware needed. Disadvantages: - Background noise can be an issue - Voice can be recorded and played back (Biometric input) - A cold may affect a user's voice
Typing tutors/Keyboarding skills	Typing tutors can help improve the speed of typing.
Note-taking software	Allows users to make notes on the device. Software can convert handwritten notes to digital.

Buying software

When buying software, you should consider the following:

- What will the software be used for?

- When will the software be used?
- Who will use the software?

Software Licensing

These are terms and conditions for installing software on a computing device. These conditions include:

- No copying or sharing of the software
- No changes are allowed to be made; (unless it is open source)
- Not allowed to be installed on more than one device; (depending on the EULA)

The following are End User License Agreements (EULA):

Single User License	Multi-User License	Site License
•One device only	•More than one device as stipulated by the agreement	•Any number of computers as long as they belong to one company

Software classifications

Stand-alone vs Integrated	<ul style="list-style-type: none"> - Stand-alone software that can "stand on its own" e.g. Windows 10 	<ul style="list-style-type: none"> - Integrated software is when more than one software is bundled into a package <p>Advantages:</p> <ul style="list-style-type: none"> - Interface is the same - Installation as a unit - Data can easily be transferred - Cheaper to buy than separate options e.g. MS Office Suite 	
Freeware vs Shareware	<ul style="list-style-type: none"> - Freeware is provided free of charged - The full program and features are available for use 	<ul style="list-style-type: none"> - Shareware is provided free of charge, with conditions: <ul style="list-style-type: none"> • Only for a period of time (trial) • With limited features <p>This is used for a user to see if they would like to buy the software after the trial version</p>	
Proprietary vs Open-source	<ul style="list-style-type: none"> - Proprietary software is software you buy, however do not own - You pay for the rights to use the software. (EULA) - The source code is never released 	<ul style="list-style-type: none"> - Open-source software is free <p>Advantages:</p> <ul style="list-style-type: none"> - Software can be shared - Source code can be edited <p>Disadvantages:</p> <ul style="list-style-type: none"> - Little or no support to users - Not as user friendly - Compatibility issues 	
Web-based vs Installed	<ul style="list-style-type: none"> - Web-based applications are accessed via the internet and can be accessed from anywhere anytime 	<ul style="list-style-type: none"> - Installed application that can be access without removable devices or the internet 	
	<p>Advantages</p> <ul style="list-style-type: none"> -No need to install -Doesn't take storage space 	<p>Disadvantages</p> <ul style="list-style-type: none"> -Web browser need to be compatible 	<p>Advantages</p> <ul style="list-style-type: none"> -More functions to use -Doesn't need internet access

	-Automatically up-to-date -Accessed from anywhere at any time	-Needs internet access -Security risk -Slower than installed apps		-Only on computer where installed
--	--	---	--	-----------------------------------

Software Problems/Issues

Issue/Problem	Description	Solution
Outdated software	Updating software would ensure that all features are up to date. If software is outdated it could cause software bugs/errors.	<ul style="list-style-type: none"> - Updates can be downloaded from the internet or from a storage medium. - Applications should be updated for new features to be added (new version) <p>Automatic updates</p> <p>Advantages:</p> <ul style="list-style-type: none"> - Software is always up to date. - Latest features available <p>Disadvantages:</p> <ul style="list-style-type: none"> - Uses bandwidth without user's knowledge - Takes up space on device
Flawed software	When an application has a bug (a small error = software bug) accidentally created by the programmer. This could cause calculation issues, navigation issues, etc.	<ul style="list-style-type: none"> - A patch is a small update to fix a software bug. - A service pack includes all patches and updates of the software
Compatibility issues	When the application is not well-suited with the hardware and software of your computer it would not function properly.	<ul style="list-style-type: none"> - Ensure that you verify the system requirements before purchasing software.
Read-only files	When a user can only read a file and not edit or change information.	<ul style="list-style-type: none"> - Save the file with a new name/location. - Go to the properties and remove the Read-only attribute.

System Requirements

System requirements refer to specific hardware and software needed for applications to "run" on a computer.

Minimum requirements	Recommended requirements
The lowest specification for the software to operate at all.	Specifications that allow the application to work at an optimal level.

Typical requirements may include:

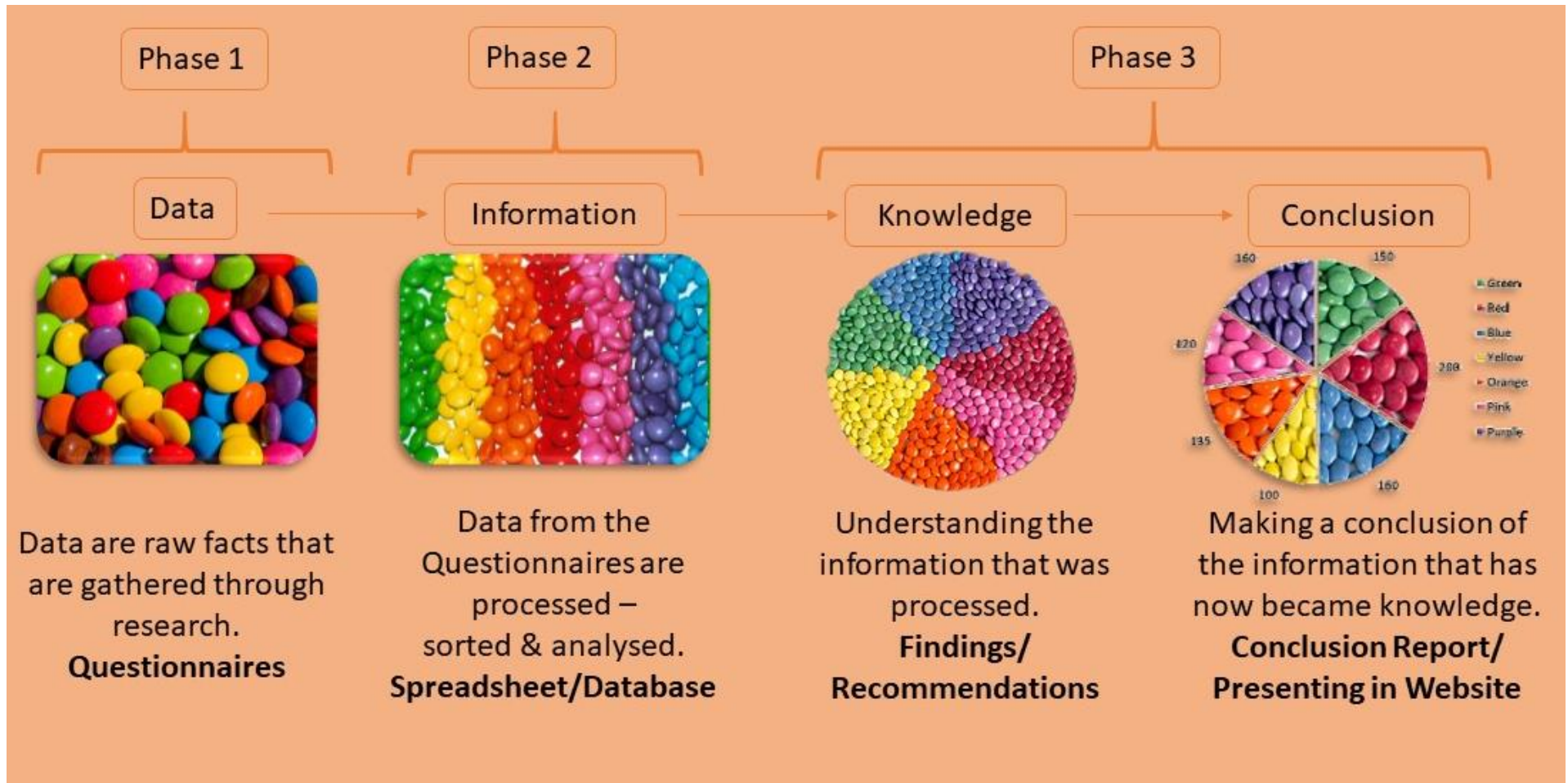
- Operating system
- CPU speed
- RAM
- Graphics processing
- Storage space

Compatibility:

When two systems work together – hardware and software.

When buying software make sure that the application will be **compatible** with the computer.

Role and use of Data, Information and Knowledge



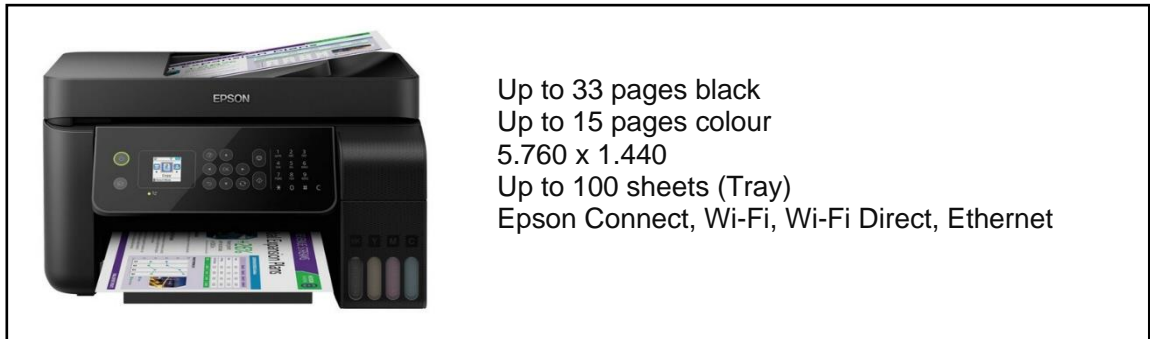
Systems Technologies Activities

Activity 1



1.
 - a. What is the size of the screen?
 - b. What does the specification 1920x1080 refer to?
 - c. 1000:01:00 refers to the contrast of the screen. Explain the purpose of the contrast?
 - d. What does 16:09 refer to on a screen?
 - e. Explain what 5 ms is **AND** what the purpose is of this?
2. State TWO advantages of LED monitors?
3.
 - a. Which port allows a user to connect a laptop to a television screen?
 - b. Give TWO advantages of using the port mentioned above?
4. What is the unit used to identify the resolution of a monitor?
5. Identify TWO advantages of using touch screens?
6. Give ONE disadvantage of having a monitor that is built-in (e.g. Laptop)?
7. State TWO advantages of using high quality resolution?
8. Explain how the size of a monitor is measured?

Activity 2



1.
 - a. State TWO specifications to consider when buying a printer, besides cost?
 - b. Besides printing, state TWO functions a multifunctional printer has?
 - c. What is the unit in which printing is measured?
 - d. What is the unit of printing **speed** measured in?
 - e. Would this printer be able to link to a network? Give a reason for your answer.
2. State TWO printing **options** that will promote green computing?
3.
 - a. What type of printer would be used for fast high-volume printing?
 - b. Give TWO advantages of using the type of printer mentioned above?
4.
 - a. What type of printer would be used for high-quality printing?
 - b. Give TWO advantages of using the type of printer mentioned above?
5. Give TWO possible reasons why a printer would not be printing?
6.
 - a. Explain how a 3D printer works?
 - b. State TWO advantages of a 3D printer?
7. Give TWO new/additional features of modern printers?
8. Give ONE disadvantage of a multifunctional printer?

Activity 3

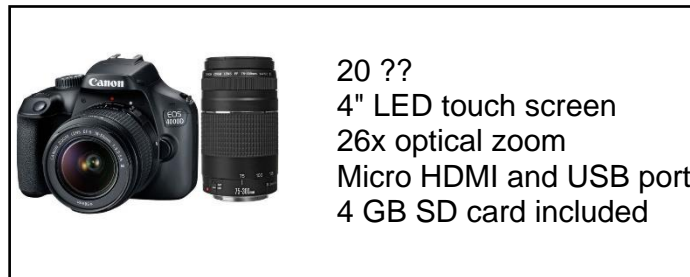
1. a. Identify the image below **AND** state the function of this image?



- b. Give ONE advantage of using this code in an advertisement?
2. Give TWO advantages of using a barcode scanner for the input of large amounts of data?
3. RFID tags and barcodes have similar functions.
- a. What type of medium does RFID tags use?
- b. Give TWO advantages for using RFID tags instead of barcodes?
4. Name the software needed to change a scanned image to text?
5. Explain what each of the following means with regards to a scanner:
- a. Dpi
- b. Colour depth
6. Suggest ONE other way to get a document to soft copy besides scanning?
7. a. How would one transfer files from one smartphone to another using NFC?
- b. Besides transferring files, state ONE other use for NFC?
8. a. Define the term biometric input **AND** explain the purpose of use?
- b. Give TWO examples of biometric input?
- c. State ONE advantage for using biometric input?

Activity 4

- Name TWO of the most common input devices on a laptop?
 - Give ONE advantage of using a wireless mouse?
- Name ONE **input device** needed for video conferencing?
- What **input device** is used to capture natural handwriting?
- Name TWO **input devices** for *visually* impaired users?
 - Name TWO **output devices** for *visually* impaired users?
- Study the specification below and answer the questions that follow:



- What is the unit in which a camera's resolution is measured?
 - State TWO specifications that influences the quality of a camera, besides the optical or digital zoom?
 - Name TWO methods of transferring files from a camera, besides using a USB cable?
- Give TWO reasons why someone would use a webcam?
 - Name TWO hardware devices necessary for video conferencing, besides a network connection?
 - Name the type of user that works with high-end hardware and software?

Activity 5

1.
 - a. What is an SSD/HDD used for?
 - b. State TWO benefits of an SSD over an HDD?
2. What is the difference between shared memory and dedicated memory?
3. What is the main function of the RAM?
4. Disk fragmentation occurs often on disk drives.
 - a. How does disk fragmentation affect a computer AND why?
 - b. Explain how to solve disk fragmentation AND what it does?
5.
 - a. Suggest TWO methods to repair a flash drive that has a virus?
 - b. Give TWO reasons why some users prefer Blu-ray format over DVD?
6. Explain the difference between RAM and a hard drive in terms of each function?
7.
 - a. What is the purpose of a CPU?
 - b. What unit is a CPU measured in?
 - c. What hardware components should generally be replaced to enhance the performance of a device?
8. What is the purpose of a graphics card?

Activity 6

1. Usually when one tries to install software (e.g. office suite) it requires a product key.
 - a. Explain what a *product key* is?
 - b. Give ONE reason why software developers would use a product key?

- c. Name the term used to describe the illegal use of software?
2. Name TWO types of **system** software?
3.
 - a. What is a backup file?
 - b. State TWO advantages of using online storage for backups?
4. Open-source software, such as Linux, are free to use and install.
 - a. State TWO features of open-source software, besides the fact that it is available freely?
 - b. Give ONE disadvantage for using open-source software?
5.
 - a. State TWO functions of an operating system?
 - b. Besides an operating system, which category of software would a user need to perform tasks?
6. Define the term minimum system requirements?
7. State TWO advantages for using an office suite, instead of individual applications?
8. To which type of software does Microsoft Edge and Mozilla Firefox belong?

Activity 7

1.
 - a. Explain what a device driver is?
 - b. Give TWO ways of finding device drivers?
2. Define the term plug-and-play?
3.
 - a. What type of license is needed to install software on a company's computers?
 - b. Name TWO other categories of license agreements?



4.
 - a. What is the difference between a software bug and a virus?
 - b. What is the difference between a patch and a service pack?
5.
 - a. What is the general term used to describe software that can be used on a trail version?
 - b. Give TWO advantages for using a trail version of software?
6. Give TWO attributes/search filters that can be used for search for a file?
7. Name TWO internet technologies or web tools that will allow users to remotely attend meetings/classes?
8. Name ONE type of program that would assist visually impaired users?

Systems Technologies Past exam papers

November 2019

- 9.1 Computing devices will be used to display the recipes and to capture the results.

Study the specifications of the following two devices:

DESKTOP COMPUTER	TABLET
	
<ul style="list-style-type: none">• 2.4 GHz CPU• 8 GB DDR4• 256 GB Solid State• 4 GB Video Card• 21" Monitor• 4 x USB ports• Integrated 10/100/1000 Network Port• Integrated HDMI port• FHD Webcam, 1920x1080• SD Card Slot• On-site warranty	<ul style="list-style-type: none">• 1300 MHz CPU• 2 GB RAM• 16 GB internal storage• Touch screen• 25.6 cm (10.1") display• Rear camera 8 MP• 4G standard LTE, Wi-Fi• Bluetooth version BT 4.0• 2G standard, GSM, 4G• SD Card Slot

- 9.1.1 What is the speed of the faster processor when comparing the two devices? (1)
- 9.1.2 Why is the tablet more suitable for outdoor use? (1)
- 9.1.3 State TWO ways in which to extend the storage space of the tablet. (2)
- 9.1.4 Explain why the desktop computer is better for graphics processing by referring to its specifications, other than the CPU. (1)
- 9.1.5 Explain what an on-site warranty is AND why a tablet does not usually have an on-site warranty. (2)

- 10.5 The network administrator should always keep the software on the computers of the weather bureau updated.
- 10.5.1 A weather analysis application is returning incorrect results after a recent update.
- Give a term for the cause of the problem AND suggest a solution. (2)
- 10.5.2 Give TWO reasons why the network administrator may not want an operating system to automatically download and install updates on the networked computers. (2)
- 10.6 Backing up is important so that data is not lost.
- 10.6.1 Give TWO reasons why the weather bureau should make automatic backups. (2)
- 10.6.2 Suggest TWO guidelines to be included in the policy for making backups at the weather bureau, other than making regular backups or setting automatic backups. (2)

November 2019

- 4.1 Name TWO input devices that can be found on a laptop computer, other than a touch screen. (2)
- 4.2 The user cannot see the full text while an e-mail is being typed on a touch screen device.
- Give TWO reasons why this happens. (2)
- 4.3 Give TWO functions of a UPS (2)
- 4.4 Discuss TWO reasons why a presenter would use a data projector instead of a monitor while presenting. (2)
- 4.5 State TWO advantages of HDMI cables over VGA cables for connecting a television to a computer. (2)
- 4.6 Give TWO reasons why 3D printers are not commonly used in a home office, other than the cost. (2)

4.7 The following system requirements are needed to install an office suite:

- 1 GHz or faster CPU
- 2 GB or more RAM
- 3 GB of available disk space
- 1024x768 or higher
- Windows 7 or later

4.7.1 Explain why it is INCORRECT to say that 1024x768 is the size of the monitor. (1)

4.7.2 Give the term used to describe the reason why this office suite will not run on an earlier version of the operating system specified above. (1)

4.8 Give TWO reasons why you would choose to buy an office suite instead of purchasing various applications by different software developers, other than the cost. (2)

4.9 Give TWO possible causes why an application stops responding. (2)

4.10 A picture was manipulated in a graphics editor and then saved.

Give TWO reasons why the saved picture now displays blurred or is unclear (2)

4.11 Explain how convergence contributes to green computing. (2)

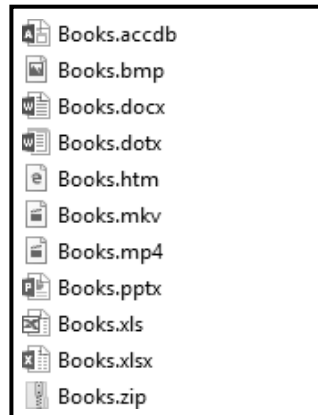
4.12 A television station is planning on replacing older analogue technology with technology for digital broadcasting.

4.12.1 Write down the general term for the process where broadcasting services are changed from analogue to digital technology. (1)

4.12.2 State TWO advantages of digital broadcasting technology for the viewers. (2)

[25]

- 4.1 What is the purpose of a driver program? (2)
- 4.2 An accounting clerk uses a keyboard that does not have a numeric keypad. Explain why a keyboard with a numeric keypad would be a better option. (2)
- 4.3 A list of files stored on a computer is shown below.



- 4.3.1 What type of content will be found in a file with a **.mp4** extension? (1)
- 4.3.2 Give the full name of the spreadsheet in the list of files above that has a newer file format. (1)
- 4.3.3 **Books.dotx** is a template file. What is a *template file*? (1)
- 4.3.4 Give ONE reason for creating a compressed file, such as **Books.zip**. (1)
- 4.4 State TWO advantages for notebook computers going into sleep mode. (2)
- 4.5 Explain the term *backward compatibility*. (2)
- 4.6 Different types of memory/storage are often used on one device.
 - 4.6.1 Give an example of memory that loses its contents if the computer is switched off. (1)
 - 4.6.2 Give TWO reasons why modern mobile devices are more likely to have built-in solid state drives instead of hard disk drives. (2)
 - 4.6.3 Why is Blu-Ray storage popular with computer gamers? (1)
 - 4.6.4 State TWO ways in which data, stored on an SD card in a camera, can be transferred to a personal computer. (2)

- 4.7 Give THREE examples of accessibility software features that are part of the operating system. (3)
- 4.8 State TWO ways to access a website without typing in the URL or the IP address in a web browser. (2)
- 4.9 One of the functions of the operating system is to provide a user interface. (2)
- Give TWO additional basic functions of the operating system. (2)
- [25]**

Prelim 2018

4.1 Study the advertisement below to answer the questions that follow:

DEVICE A	DEVICE B
DVI, VGA and HDMI output	DVI, VGA and HDMI output
Dual Core i5™ 7360U 3.4 GHz	6 Core Ryzen™5 1600 3.2GHz
Integrated Intel Iris Graphics 6000	AMD Radeon RX 580 4G 256bit DDR5 Graphics Card
8GB DDR4-2133Mhz	8GB DDR4-2133Mhz
3TB WD Blue 7200RPM Hard Drive	512GB SSD
LG Blu-Ray Internal Writer BH16NS40 (optional)	LG Blu-Ray Internal Writer BH16NS40 (optional)
Wireless: 802.11ac, Bluetooth 4.0	Wireless: 802.11ac, Bluetooth 4.0
Linux Ubuntu 18.3 64 bit	Linux Mint 18.3 64 bit

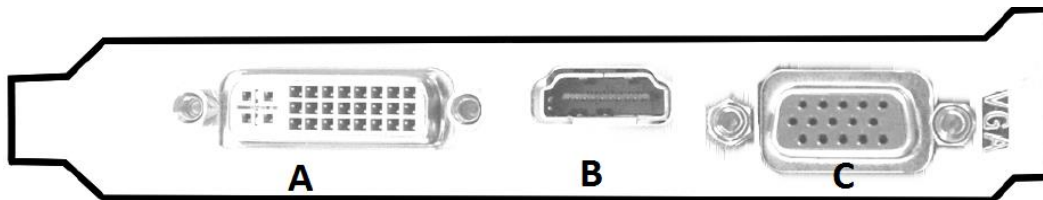
- 4.1.1 Although Device A shows a higher processing speed than Device B, the seller claims that Device B is the "faster" of the two. Provide TWO reasons why this could be the case. (2)
- 4.1.2 The Blu-Ray writer is an optional extra on both devices. If the buyer decides not to have this drive included he will be unable to read optical disks and may face certain challenges in using the device.

Copy the following table to list two problems AND provide possible solutions for solving these problems if you use a device without an optical drive. *Note: you may not use the same solution for both problems.*

PROBLEM	SOLUTION
1.	1.
2.	2.

(4)

- 4.1.3 The operating system on both devices is known as open-source software (OSS). Provide TWO reasons why the seller chooses to load this instead of proprietary software. (2)
- 4.2 There are different ways to connect a monitor to a computer. Study the picture below and answer the questions that follow.



- 4.2.1 Name port B. (1)
- 4.2.2 State TWO disadvantages of port C compared to port B. (2)
- 4.3 The image below appears on a school's newsletter



- 4.3.1 What is this image called? (1)
- 4.3.2 Describe how it would be used by referring to a suitable example. (2)
- 4.4 SSD's are becoming quite popular but hard disk drives are still widely used. Provide two reasons why HDD's are still found on many new devices. (2)
- 4.5 Your school is planning to implement BYOD for use by the learners. Explain what "BYOD" means, not what the acronym stands for. (2)
- 4.6 Name ONE advantage and ONE disadvantage of a wireless mouse. (2)
- 4.7 Your school is considering the purchase of a 3D-printer. Give a brief definition of a 3D-printer and explain how it works. (2)
- 4.8 Why is it necessary for the school to know which programs they will be using, before buying a computer? (1)
- 4.9 Suggest TWO methods that could be used to repair a flash drive that has been infected with a virus. (2)

[25]

November 2017

- 4.1 State TWO disadvantages of wireless keyboards. (2)
- 4.2 State TWO ways in which the GUI of a mobile app differs from the desktop version of the same app (2)
- 4.3 What kind of desktop computer is a result of convergence? (1)
- 4.4 Suggest TWO ways to fix a mouse pointer that moves in an unpredictable way, without replacing the mouse. (2)
- 4.5 Give TWO reasons why many modern notebooks no longer include an optical drive. (2)
- 4.6 State TWO uses of NFC on smartphones. (2)
- 4.7 What should a user do when the trial period of a software product has expired? (1)
- 4.8 PDF is a popular file format.
- 4.8.1 State ONE advantage of using the PDF file format. (1)
- 4.8.2 How would you convert an office suite document to PDF? (1)
- 4.8.3 You receive two documents in PDF format. Both are one page long.
Explain why they have different file sizes AND why it is not possible to do a text search in one of the two. (2)
- 4.9 Explain TWO ways to find a program on your computer, OTHER than using the Start Menu (2)
- 4.10 Explain how a POS device finds the price of a product after it is scanned. (2)
- 4.11 Name TWO features to look for in laptop computer hardware that will make upgrades easier in future. (2)
- 4.12 Virtual reality (VR) equipment is becoming more affordable.
- 4.12.1 Name TWO pieces of equipment one would need for VR. (2)
- 4.12.2 State ONE way in which VR can be used. (1)

[25]

 DVI, VGA and HDMI output

6 Core Ryzen™ 5 X470 3.2GHz 

AMD Radeon RX 580 4G 256bit DDR5 Graphics Card

8GB DDR4-2133Mhz

512 GB SSD

LG DVD Internal Writer

802.11 a/b/g/n

Bluetooth 4.0

Linux Mint 19.1 64 bit Cinnamon

- 4.1 Compare the two drives above and indicate the following:
- 4.1.1 You have the option of replacing the SSD indicated in the specifications with a HDD costing the same price. Why would any buyer consider this option? (1)
- 4.1.2 Motivate why you think it would have been better to keep the SSD (give 3 reasons) (3)
- 4.2 The technician at the distributor has indicated that you can replace the 6 Core Ryzen™5 X470 3.2GHz CPU with a Dual Core i5™ 7360U 3.4 GHz. He pointed out that the clock speed of this CPU is higher than the CPU shown in the specifications but that the computer would in fact be slower. Give the reason why the 3.4 GHz computer would be slower than the 3.2 GHz computer. (1)
- 4.3 Could this computer be used to play a movie on Blu-ray? Motivate your answer. (1)

- 4.4 One of your friends indicates that the operating system is very important for the computer system to work.
- 4.4.1 Name the operating system that is loaded on this computer (1)
 - 4.4.2 The salesperson ensures you that the system software will also be able to handle BYOD. Explain what "BYOD" means, not just what the acronym stands for. (2)
 - 4.4.3 List TWO disadvantages of open source software. (2)
 - 4.4.4 Indicate the difference between open source software and freeware. (1)
- 4.5 You are considering buying a digital camera with the computer. The salesman indicates that you have to consider the resolution.
- 4.5.1 Indicate the advantages of higher resolution pictures. (3)
 - 4.5.2 State TWO ways in which data stored on a SD card in a camera can be transferred to a computer. (2)
- 4.6 The motherboard on the computer provides 4 USB ports. You are concerned that you will need at least 6 USB ports. Provide 2 methods that can be used to make more USB ports available. (2)
- 4.7 Give the specification that indicates that the computer will be able to connect to a Wi-Fi network. (1)
- 4.8 What does a site licence allow a user to do? (2)
- 4.9 Excluding image quality, give ONE reason why HDMI has an advantage over VGA as a means of output. (1)
- Identify the image below that appears on a newsletter AND explain how it would be used, by referring to a suitable example. (2)



System Technologies Activities Solutions

Activity 1

1.
 - a. 21.5"
 - b. Resolution/Quality
 - c. This refers to the screen's darkest colours in contrast with the lightest colours.
 - d. Aspect ratio
 - e. 5 ms refers to the response time of a screen
2.
 - Low power consumption
 - Slimmer/Takes less space
 - High resolution/Better quality
 - Larger sizes available, etc.
3.
 - a. HDMI
 - b.
 - It provides both audio and video
 - Higher quality/resolution
4. Pixels
5.
 - More space for a larger screen due to fewer physical buttons
 - On-screen menus and buttons can be changed
 - Gestures e.g. swiping/pinching/zooming
 - Easier to work with, etc.
6.
 - Difficult to repair
 - Costly to fix
 - IF something is damaged the whole laptop has to be send in.
7.
 - Larger pictures
 - Better cropping options
 - Clearer images
8.
 - Diagonally from one corner to the opposite corner

Activity 2

1.
 - a.
 - Resolution/DPI/Quality of the printouts
 - Printer speed/PPM
 - Connectivity options, e.g. Wireless, USB, etc.

- Printer capacity (industrial level)/Duty cycle
 - Multifunction ability, e.g. copying, scanning, etc.
 - Paper size/Borderless printing
 - User interface options
 - Duplex/Two-sided printing option
 - Colour/Monochrome printing
 - Printing technology, i.e. size and number of ink tanks, toner, etc.
 - Paper tray capacity
- b.
- Scan
 - Fax
 - Copy
- c. ppm
- d. dpi
- e. Yes, it has Wi-Fi/Ethernet capability
- 2.
- Print multiple pages per sheet
 - Print only specific pages
 - Print preview to catch errors before final print
 - Print in grayscale
 - Print to file
 - Print 'back-to-back'/both sides of pages
 - Print in draft/'econo'-mode
3. a. Laser printer
- b.
- It is faster than an inkjet printer
 - It cost less to maintain and use
4. a. Inkjet printer
- b.
- Produces best photo/image quality printing
 - Initially lower costs
- 5.
- The printer may be disconnected from the computer
 - The printer may be switched off
 - The printer might not be installed correctly
 - There might not be paper in the printer
 - The printer might not have any ink/toner left, etc.
6. a. A 3D printer creates 3 dimensional objects by adding consecutive layers of material on top of each other.
- b.
- Print a model of a product that does not yet exist
 - Customers can inspect a physical model before it is manufactured
 - Ordinary users can easily create 3D objects

- Can be used in the manufacture process.
 - Companies may find it to be cost effective
7.
 - Connectivity via network/wireless e.g. Wi-Fi, Bluetooth, etc.
 - Integrated software features, e.g. remote printing
 - 3D printing
 - Memory card reader/Direct printing from flash drive
 - Erasable toner/Unprinting
 - Touch screen/pad interface, etc.
 8.
 - If the one function fails, all functionality may be lost
 - If the one function fails, whole device goes in for repair as opposed to single/separate devices
 - Can only use one function at a time
 - Extra functions may not be required by the user/unnecessarily increase the cost, etc.

Activity 3

1. a. QR code
They are generally used as a link to a website
- b.
 - No need to type in the URL
 - Less errors are made
 - QR code scanners (software) can be downloaded/used for free
 - Can store extra information such as logos, etc.
2.
 - It will be faster/easier than manual methods
 - More accurate/no human error
3. a. Radio frequency
- b.
 - Can scan multiple tags at once
 - Doesn't have to be very close to the scanner
4. OCR
5. a. The dpi indicates the resolution/amount of pixels
- b. Colour depth refers to the number of colours that can be recognised by the scanner.
6.
 - Take a picture with a camera/smartphone/tablet
 - Fax to e-mail
 - Retype and save as an electronic copy
7. a. Place the devices very close to each other / Let the devices touch each other

- b.
 - Making payments
 - Identification
 - Initiate an action/ launch an app
- 8. a. Using unique human features as security for a device
- b.
 - Facial recognition
 - Fingerprint
 - Iris/retinal scan
 - Voice recognition
- c.
 - Cannot be forgotten like a password
 - Unique to each person

Activity 4

- 1. a.
 - Keyboard
 - Pointing devices: such as touch pad/joystick
 - Microphone
 - Touch screen
 - Fingerprint reader
- b.
 - May free up desk space
 - Reduce clutter/no cables (*Accept 'easier to use', only if motivated correctly*)
 - Mouse can be used at a distance further away from a computer than a mouse cable would allow
- 2.
 - Webcam
 - Microphone
- 3. Stylus
- 4. a.
 - Microphone
 - Braille keyboard
- b.
 - Speakers
 - Larger screen
- 5. a. MP (megapixels)
- b.
 - Quality of the lens
 - Quality/size/type of sensor, e.g. CMOS performs better in low light than CCD, colour depth
 - On-board software/Software filters
 - ISO rating
 - Image stabilisation
 - Image processor

- Megapixel value/Resolution
 - Shutter speed
 - Flash, etc.
- c.
- Memory card reader
 - Bluetooth
 - 3G/Wi-Fi (such as Eye-Fi)/E-mail
 - Automatically uploads/ to cloud storage such as Dropbox
 - Firewire
- 6.
- Captures images/videos
 - Allows VoIP (Skype)/video telephone calls
 - Broadcast live images over the Internet
 - Facial recognition – security feature, etc.
- 7.
- Webcam/Camera
 - Speakers/Earphones/Headphones
 - Microphone
 - (Bluetooth) Headset
 - Monitor/Screen/Projector
 - Smartphone/Computer/Tablet
8. Super/Power user

Activity 5

1. a. To (permanently) store data
- b.
- Faster data access
 - Less susceptible to damage/No movable parts
 - Less power consumption
 - Smaller physical size
 - No noise
 - No fragmentation
 - Compatible with many different computer types, etc.
2. An adapter does not have its own dedicated memory. It shares/uses the RAM on the computer.
3. Temporary storage of data and instructions
4. a. A fragmented disk slows down the device because files are scattered on the device
- b. Defragmentation this is when files are rearranged in the correct order
5. a.
- Run an antivirus scan
 - Toolkit

- Delete infected file
- b.
- It has a better quality of picture/audio than a DVD
 - It is newer technology/features
 - Larger capacity
 - Backward compatibility with all disc formats
6. RAM temporarily only holds/stores programs/data currently being/waiting to be processed by the CPU.

Hard drive stores all programs/data/files/information/Hard drive is permanent storage.

7. a. To process the input of data/information
- b. GHz
- c.
- RAM
 - Hard drive
 - CPU
8. Displays an image on the screen

Activity 6

1. a. Code assigned to software which users need to enter to install and use the software
- b. Prevents (software) piracy or ensures that users pay for the program
- c. (Software) piracy
- 2.
- Operating system
 - Utility programs

(Note to marker: Accept any specific utility programs, for example driver programs, anti-virus program, etc. as utility programs. Do not accept any brand names.)

3. a. A copy of data/information that is stored in a different physical place from the original data
- b.
- Can access data from anywhere in the world where an Internet connection is available
 - Saves local storage space
 - Data is less likely to be lost, etc.
4. a.
- Open source software provides access to the source code which can be used and modified
 - Open source software can be freely redistributed (but not sold)

- Has limited copyright restrictions (*Most Free and Open Source software (FOSS) has a general licence such as the General Public Licence (GNU GPL) which does have some restrictions, such as acknowledging the original source, etc.*)
- b.
- There may be very little/no technical support/no support offered by the developer
 - There may be fewer training opportunities/manuals or tutorials available than for proprietary software
 - Software may not be as widely used as proprietary software
 - Software may not be compatible with other proprietary software
 - May contain fewer functions than other proprietary software, etc.
5. a.
- Provides a user interface
 - Coordinates activities between hardware and software
 - Manages hardware and software resources
 - Provides basic security
 - Provides file management facilities
 - Provides a platform from where programs can be run, etc.
- b. Application Software.
6. The lowest/minimum hardware/software specifications required to load specific applications/software
- 7.
- Can integrate between the different applications
 - Interface is standardised across the different applications
 - Functions are standardised across the programs
 - Cost – cheaper to purchase an office suite
 - Easier to manage updates
8. Web browser

Activity 7

1. a. It is software/program/utility that allows a device to communicate with/be used by the operating system/computer
- b.
- Check which drivers were automatically installed from the operating system's database/load generic drivers
 - Check on the CD that comes with the printer
 - Download from the Internet/manufacturer's website
 - Borrow a CD from someone who has the same printer,
 - Obtain from a computer shop, etc.
2. The driver program for many generic and specific devices is **pre-loaded** on

the computer as part of the operating system and is **automatically installed** when the device is plugged into the computer.

3. a. Site license
- b. Single user license
Multiuser license
4. a. A software bug is created by mistake/programming error whereas a virus is software specifically designed to negatively affect or disrupt functioning of a computer
- b. A patch is a software solution to fix one specific problem.

A service pack is a collection of all the patches/updates up to a specific point in time (including new features) distributed as one package.

5. a. Shareware/Demo/Trialware/Beta
- b.
 - To test the program first (for suitability) before buying it
 - Checking to see if the full version is required
 - Checking user friendliness/Quality of user interface
 - Checking compatibility with existing software/hardware, etc.
6.
 - Date range (recently downloaded)
 - Size (videos tend to be large)
 - File type/file extension (search for video files e.g. MP4, etc.)
 - Partial name of the file (if you think you remember or can guess part of the name)
7.
 - Remote connection/VPN tools, e.g. TeamViewer, Remote admin, etc.
 - VoIP tools, e.g. Skype, etc.
 - IM tools, e.g. WhatsApp, etc.
 - Cloud storage facilities, e.g. OneDrive, Dropbox, etc.
 - E-mail, e.g. Gmail, Outlook, etc.
 - Live streaming
 - LMS systems e.g. Moodle, Google Classroom
 - Social media e.g. Facebook group
 - Web conferencing software, e.g. WebEx, Office Live Meeting, etc.
8.
 - Screen reader
 - Text-to-speech program (e.g. Narrator)
 - Speech-to-text (e.g. Dragon Dictate)

Systems Technologies Past Exam Papers Solutions

November 2019

- 9.1.1 **Speed of the faster CPU**
2.4 GHz✓ 1
- 9.1.2 **ONE reason for the tablet being more suitable for outdoor use**
- (1) A tablet is portable/Not dependent on external power source
 - (2) The tablet is LTE/4G/Wi-Fi enabled
 - (3) Can be easily tilted/moved around to avoid glare
- ✓ (Any one) 1
- 9.1.3 **TWO ways to extend the storage space of the tablet**
- (1) Use an SD Card/memory card
 - (2) Use an (OTG) flash drive/external hard drive
 - (3) Use an online/cloud storage service
- ✓✓ (Any two) 2
- 9.1.4 **ONE reason for the desktop computer being better for graphics processing**
- (1) Has a (dedicated) video/graphics card
 - (2) Has more RAM
- ✓ (Any one) 1
- 9.1.5 **Explanation of an on-site warranty**
The manufacturer will arrange for pickup or repair the device at the client's premises✓
Reason why tablets do not have on-site warranties
Tablets are small/portable enough for the owner to easily take it back to the store✓ 2

10.5.1 **Cause of the software problem**

Bug✓

Solution

- (1) System restore/Roll back to previous date/time where the software worked properly
- (2) Install a patch/service pack (from the vendor website)
- (3) Re-install the software

✓ (Any one)

(Note to marker: Accept 'Glitch' as the cause with 'Restart' as the solution.) 2

10.5.2 **TWO reasons why OS updates should NOT automatically download on networked computers**

- (1) Automatic updates may use a lot of bandwidth
- (2) Automatic updates may use a lot of storage space
- (3) Updates may slow down the network/Computers may restart automatically to install updates during times when they are in use
- (4) Updates may cause the computers/network to become unstable/May cause compatibility issues with existing software/ Possible introduction of bugs
- (5) OS updates may not be needed by the users

✓✓ (Any two)

(Note to marker: Do not accept any answer related to data usage and cost.) 2

10.6.1 **TWO reasons for automatic backups**

- (1) Saves time due to scheduled backups/No user intervention required for backups
- (2) Ensures backup is always/regularly/timeously done/Employees may forget if done manually
- (3) Time/schedule backups when computers are not in use

✓✓ (Any two)

(Note to marker: Do NOT accept reasons for a backup that is NOT automatic.) 2

10.6.2 **TWO guidelines in the policy for making backups, other than making regular backups or setting automatic backups**

- (1) Only backup when computers are not being used
- (2) Do not store backups in the same location as the original data/Specify location of backups
- (3) Specify a storage medium
- (4) Backup to multiple types of media
- (5) Do incremental backups to save space/data/Only backup recent data and not everything
- (6) Do not backup software/programs that can be reinstalled
- (7) Encrypt sensitive data on backup/Ensure changes cannot be made to the backup
- (8) Testing of backups
- (9) Responsible person for backups

✓✓ (Any two) 2

[15]

November 2019

4.1 **TWO input devices found on a laptop computer**

- (1) Keyboard/Keypad
- (2) Touch pad/Track pad
- (3) Microphone
- (4) Camera/Webcam
- (5) Fingerprint scanner
- (6) Track point/Pointing stick

✓✓ (Any two) 2

4.2 **TWO reasons why all text on a touch screen device does not display**

- (1) On-screen keyboard is blocking the text
- (2) Font size is too large (zoomed)/Screen size is too small
- (3) More than one app is opened which takes up screen space
- (4) Text is scrolled out of view/Auto-rotation is not turned on

✓✓ (Any two) 2

4.3 **TWO functions of a UPS**

- (1) Provides temporary backup power during power failures/dips✓ to save work
- (2) Protects the computer from power surges/fluctuations/dips✓

2

- 4.4 **TWO reasons for using a data projector instead of a monitor**
- (1) The display can be used for large groups of people
 - (2) Image size can be varied
 - (3) Can display on a variety of surfaces
 - (4) Data projector is easier to move/carry around (Comparable sizes)
- ✓✓ (Any two) 2
- 4.5 **TWO advantages of HDMI cables over VGA cables**
- (1) Digital signal results in better audio/video quality (higher resolution)/HDMI enables better quality images/display
 - (2) Transmits both audio and video data
 - (3) Faster data transfer
- ✓✓ (Any two) 2
- 4.6 **TWO reasons why 3D-printers are not commonly used in home offices**
- (1) Not multifunction: cannot scan/copy/cannot print on paper
 - (2) Home office users generally do not need to print 3D models
 - (3) Emissions may possibly be toxic (smelly/odour)
- ✓✓ (Any two) 2
- 4.7.1 **ONE reason why 1024x768 does not refer to size of the monitor**
- 1024x768 refers to the resolution and NOT the physical screen size/display ratio/Screen size is given in inches✓
- 4.7.2 **Term used to describe why software will not work on an earlier version of the OS**
- Compatibility✓ 2
- 4.8 **TWO reasons for purchasing an office suite rather than applications by various software developers**
- (1) Office suite/Applications will have a similar GUI/environment
 - (2) Easy to share data between applications/Integration of data
 - (3) All applications are available from a single installation
 - (4) Only single update required for all applications
- ✓ (Any two) 2

4.9 **TWO causes for an application to stop responding**

- (1) Lack of **system resources**, e.g. Not enough RAM to run application/Lack of disk access/Too many applications running in the background/Application is in the process of updating
- (2) Lack of **network** access/connectivity
- (3) Hardware **malfunction**, e.g. faulty RAM, CPU overheating, etc.
- (4) Corruption of the **software**/Faulty software/Software bug
- (5) Malware, e.g. Virus infection, Hacking software

✓✓ (Any two)

(Note to marker: Allocate two marks if the candidate gives two valid points in the same bullet, e.g. Faulty RAM and faulty CPU.)

2

4.10 **TWO reasons why a picture becomes blurred or is unclear**

- (1) The picture size was increased/Pixilation
- (2) It was saved at a lower resolution
- (3) It was saved in a different file format
- (4) Aspect ratio was changed
- (5) Sharpness/Softness/Contrast of the picture was adjusted
- (6) Graphic effects were applied

✓✓ (Any two) 2

4.11 **How convergence contributes to green computing**

Fewer devices mean:

- (1) fewer resources/materials being used (in the manufacturing process)
- (2) less going to landfills/less e-waste
- (3) fewer emissions (e.g. in manufacturing/transport)
- (4) less power/electricity being consumed

✓✓ (Any two) 2

4.12.1 **Term for analogue broadcast changed to digital broadcast**

(Digital) migration✓

4.12.2 **TWO advantages of digital broadcasting technology for the viewer**

- (1) Sharper picture/video/higher resolution/Support HD devices
- (2) Streaming/video on demand
- (3) Better quality sound
- (4) More television channels available
- (5) Music/Radio channels also available
- (6) The availability of other services, e.g. optional languages/subtitles/parental lock, etc.
- (7) Electronic programming guide

✓✓ (Any two) 3

[25]

4.1	Purpose of a driver program Allows the operating system to communicate✓ with the device✓	2
4.2	Motivation for using a numeric keypad The (ergonomic) arrangement of the keys✓ results in: AND one impact✓ <ul style="list-style-type: none"> • Improved accuracy • Increased speed • Improved productivity 	2
4.3.1	MP4 file Video✓/Audio/Pictures/Text	1
4.3.2	Newer file format Books.xlsx✓	1
4.3.3	Template file A document that has pre-set formatting and layout✓/Blueprint	1
4.3.4	ONE reason for creating a compressed file Storage <ul style="list-style-type: none"> • Possible saving on storage space • For archiving or backup purposes E-mail <ul style="list-style-type: none"> • Sending a file/smaller attachment via e-mail • Download time for an e-mail attachment is quicker/uses less data • E-mailing multiple files in a single attachment only possible if zipped File transfer <ul style="list-style-type: none"> • Creating one file from multiple files results in faster transfer • Reducing larger file/s for faster transfer • Large files can be split into multiple files Security <ul style="list-style-type: none"> • To add encryption/password to the file/Additional security 	1
	✓ (Any one)	4

4.4	TWO advantages of sleep mode		
	<ul style="list-style-type: none"> • Saves on battery life/electricity • Fast to resume • Users can pick up where they left off with regard to applications that were open • Automatic security measure if user is away from notebook and a password/biometric feature is necessary to activate it • Updates can still be downloaded/installed 		
		✓✓ (Any two)	2
4.5	Backward compatibility		
	Newer versions of software/hardware✓ will support older versions✓ of software/hardware		
			2
4.6.1	Example of memory		
	<ul style="list-style-type: none"> • RAM✓/Cache memory 		1
4.6.2	TWO reasons for SSD over HDD for mobile devices		
	<ul style="list-style-type: none"> • SSDs use less power than HDDs • SSDs have better data transfer rates than HDDs • SSD technology more up-to-date • SSDs are less prone to breakage on impact • Physical size of SSD is smaller/lighter than HDD • Generates less heat 		
		✓✓ (Any two)	2
4.6.3	Popularity of Blu-Ray storage		
	<ul style="list-style-type: none"> • Size of games require higher storage capacity/Capacity allows for storage of high quality content • Easier to distribute games on Blu-Ray than downloading over the internet 		1
		✓ (Any one)	
4.6.4	TWO ways to transfer data from SD card to PC		
	<ul style="list-style-type: none"> • Connect camera to the PC via USB cable/Use connector to PC • Use wireless data transfer feature of camera, e.g. Bluetooth, NFC or Wi-Fi • Transfer to cloud and download to PC • Insert SD card into PC/Card reader 		2
		✓✓ (Any two)	6

4.7 **THREE examples of accessibility software features**

- Magnifier
- Speech/Voice recognition
- On-screen keyboard
- Sticky keys/Toggle keys/Filter keys/Mouse keys
- Text to speech/Narrator
- Audio description
- High contrast theme/Sound warning
- Enlarged cursor
- Closed captions/Subtitles
- Notifications
- Mono audio, etc.

✓✓✓ (Any three) 3

4.8 **TWO ways to access a website without typing a URL/IP address in the browser**

- Click on a hyperlink/Click on a hyperlink from a search engine result
- Use bookmarks/Favourites/Homepage
- Use the History/Most visited
- Use a QR code/NFC tag
- Speech recognition
- Digital assistant

✓✓ (Any two) 2

4.9 **TWO functions of the operating system (not user interface)**

- Provides basic security✓
- Basic running of the computer✓

OR

- Memory management
- Input and output management
- Co-ordinating/Managing tasks/programs
- Provides basic security
- Device management (e.g. Disk management, printers, etc.)

✓✓ (Any two) 2

[25]

Prelim 2018

4.1	4.1.1	(Any Two) ✓✓	<ul style="list-style-type: none"> • More Cores (6 vs 2) • SSD vs HDD (faster disk drive) • High speed graphics card vs integrated graphics (better graphics) 	2
	4.1.2	Problems: (Any Two) ✓✓	<ul style="list-style-type: none"> • Inability to install Software (most software are on cd/dvd) • Cannot play movies/music from cd's dvd's • Cannot write cd's, dvd's e.g. authoring dvd's, backups/archives of data. 	
		Solutions: (Any Two) ✓✓	<ul style="list-style-type: none"> • Download/Streaming from the internet/app store • Any external drive (Flash, external HDD, external DVD drive, etc.) • Install from a LAN • Cloud computing 	4
	4.1.3	Any TWO reasons:✓✓	<ul style="list-style-type: none"> • Linux is free to load • Very stable • Can be changed to adapt to the users' needs/source code is available • Less vulnerable to viruses 	
4.2	4.2.1	HDMI ✓		2
	4.2.2	<ul style="list-style-type: none"> • Slow data transfer • No Sound • Lower resolution (any 2) ✓✓ 		1
4.3	4.3.1	QR Code / 2d barcode ✓		2
	4.3.2	<ul style="list-style-type: none"> • It would be scanned by a cell phone to reveal the info it contains ✓ • Any example such as a URL or link to a website ✓ 		1
4.4		<ul style="list-style-type: none"> • SSD more expensive per GB • Larger capacity drives quite scarce • They are not suitable for long term storage (archiving) as they lose charge • Limited read/write cycles [Any 2 ✓✓] 		2
4.5		<ul style="list-style-type: none"> • refers to a concept where people are allowed to bring and use their own portable devices, ✓ • to access the network. ✓ 		2

4.6	Advantage: <ul style="list-style-type: none"> ● no wires/more mobile/portability/less limitations i.t.o. reach ✓ Disadvantage: (any one) ✓ <ul style="list-style-type: none"> ● Needs batteries ● Easier to steal ● Slower response rate especially for gamers 	2
4.7	<ul style="list-style-type: none"> ● 3D printers create three-dimensional solid objects from a digital model by ✓ ● placing successive layers of material on top of each other ✓ 	2
4.8	System requirements of the software needs to be considered ✓	1
4.9	<ul style="list-style-type: none"> ● Run an antivirus scan ✓ ● Format ✓ 	2
		[25]

November 2017

4.1	<ul style="list-style-type: none"> ● Limited range ● Prone to interference/crosstalk ● More expensive than wired keyboards ● If transceiver is damaged/lost/stolen, keyboard has to be replaced as well/Easily stolen ● Keyboard drivers only load once operating system is loaded ● Can be intercepted/tapped into by hackers ● Latency during gaming/Not as responsive as wired keyboards 	✓✓ (Any two) 2
4.2	<ul style="list-style-type: none"> ● Buttons/Components designed for smaller screen ● No scroll bars ● Fewer screen elements visible/Less information visible ● No mouse pointer required/Designed for touch interface 	✓✓ (Any two) 2
4.3	All-in-one computer ✓	1
4.4	<ul style="list-style-type: none"> ● Re-install driver ● Check cable/transceiver connection ● Try another surface for the mouse ● Re-start the computer/mouse ● Adjust mouse pointer settings/speed/sensitivity ● Try another USB port ● Clean/Clear any residue on optical sensor ● Replace battery on wireless mouse 	✓✓ (Any two) 2
4.5	<ul style="list-style-type: none"> ● Most data/software is available to download ● Reduction in size/Lighter to carry ● Save on battery life/Longer battery life ● Other larger capacity storage options available 	2

	<ul style="list-style-type: none"> • Less demand for optical media/Obsolete 	✓ ✓ (Any two)	
4.6	<ul style="list-style-type: none"> • Transfer of files/data between devices • Can be used for payments • Can be used with RFID tags 	✓ ✓ (Any two)	2
4.7	<ul style="list-style-type: none"> • Uninstall the software/Stop using the software • Purchase a licence/Register the software • Continue using with reduced functionality 	✓ (Any one)	1
4.8.1	<ul style="list-style-type: none"> • Easier to share with others who do not have the program in which it was originally created/Reader is freely available • Layout and formatting will be maintained • Can add security to pdf to make it difficult to edit/print • Reduced file size 	✓ (Any one)	1
4.8.2	<ul style="list-style-type: none"> • Save as PDF/Send to PDF • Export to PDF • Print to PDF • Use converter software • Print on paper and scan to pdf/Fax to e-mail 	✓ (Any one)	1
4.8.3	<ul style="list-style-type: none"> • Difference in DPI if they were scanned to pdf • Different content, e.g. smaller document is from text/larger document is from an image • Different PDF converters were used/Converted from different programs 	✓ (Any one)	1

AND

	<ul style="list-style-type: none"> • OCR data is not available/PDF is an image • PDF security does not allow the search function 	✓ (Any one)	2
4.9	<ul style="list-style-type: none"> • Use search program and files tool • Use a file management app (e.g. Windows Explorer, My Computer) and navigate to folder • Check for shortcuts on desktop • Open a recent document for a particular application • Check programs pinned to the taskbar • Check add/remove programs list • Use Run Command feature 	✓ ✓ (Any two)	2
4.10	Searches a database ✓ using a product code/key/barcode ✓		2
4.11	<ul style="list-style-type: none"> • Extra RAM slots available/Ability to add more RAM • Extra ports available • Replaceable graphics card/adaptor • Replaceable CPU • Extra hard drive bay available/Replaceable hard disk drive/SSD 		2

	<ul style="list-style-type: none"> • Replaceable optical drive • Removable battery 	✓✓ (Any two)	
4.12.1	<ul style="list-style-type: none"> • Head gear/Helmet with screen • Headphones • Gaming console • Smartphones/Mobile device/Cellphone • Gloves/Body suit with sensors/controllers • Box/Room/Simulation environment 	✓✓ (Any two)	2
4.12.2	<ul style="list-style-type: none"> • Tourism/Virtual tours • Flight simulation • Entertainment/Gaming • Communication • Education 	✓ (Any one)	1
			[25]

Prelim 2019

4.1	4.1.1	Higher capacity for the same price ✓	(1)
	4.1.2	<ul style="list-style-type: none"> • SSD is faster and has better performance than an HDD. ✓ • SSD is less likely to get damaged because of no moving parts. (reliability robustness) ✓ • SSD is quiet compared to HDD. ✓ • Read/write speed (data access) of SSD is extremely fast and much quicker than HDD. • SSD uses 'flash memory' to store data and is not affected by magnetic interference. • SSD has low power consumption. • SSD is easier to carry around because of its physical size (2.5 inch) which is smaller than the size of an HDD (3.5 inch). • SSD does not become fragmented therefore there is no need to defrag. 	(3)
4.2		The 3.2 GHz CPU has 6 Cores vs 2 Cores ✓	(1)
4.3		No. DVD drive cannot read Blue Ray ✓	(1)
4.4	4.4.1	Linux Mint (accept Linux) ✓	(1)
	4.4.2	<ul style="list-style-type: none"> • BYOD refers to a concept where people are allowed to bring and use their own portable devices, ✓ • to access the network. ✓ 	(2)
		(Any 2)	
	4.4.3	<ul style="list-style-type: none"> • Can be difficult for unskilled users to use. ✓ • Most people are familiar with propriety software and finds open source software intimidating. ✓ 	(2)

- In some cases, the hardware may not be compatible with open source software and will need additional drivers. (Any 2)
- 4.4.4 Freeware does not always allow the source code to be accessed and modified. ✓ (1)
- 4.5 4.5.1
- Larger picture size. ✓
 - Better quality images taken in low light situations. ✓
 - Better cropping options.
 - Better text identification.
 - Clearer and sharper images. (Any 3)
- 4.5.2
- Connect the camera to the pc via USB cable (2)
 - Wireless transfer (Bluetooth; Wi-Fi; NFC; Wi-Fi Direct)
 - Use a card reader
 - Transfer to cloud and download to PC (Any 2)
- 4.6
- Use the PS2 ports for the keyboard and mouse instead of USB (2)
 - Use a USB hub
 - Use a plugin card with extra USB ports (Any 2)
- 4.7 802.11 a/b/g/n ✓ (1)
- 4.8 A site licence allows the installation of software ✓ on all devices in the company ✓ (2)
- 4.9
- HDMI cable carries video AND audio. (1)
 - Can connect directly to TV / data projectors
- (Any 1. Do not accept: "Better image quality")
- 4.10
- QR code/2D barcode. ✓ (2)
 - It would be scanned (by a smartphone) to reveal the text/information it contains. **OR**
 - to open a URL ✓ (Any 1 of the 2 options)

[25]

Summary of Internet Technologies

Types of digital communication

The way in which one computing device transfers data from one point to another. Protocols control the way devices send and receive data. Examples include emails, messaging, blogs, wikis and social networks.

Video Conferencing

Video Conferencing is used mostly by business to conduct meetings and conferences by means of video communication. Video conferencing uses a network of computing devices to talk, see and hear one another even if they are in different locations

Advantages	Disadvantages
Can save money on traveling costs.	Expensive to setup and maintain a video conferencing lab. One needs a fast internet connection.
Video and audio information can be shared.	A power failure or network failure can cause a break in communication
Enables collaboration and can strengthen relationships between colleagues.	Training is needed to use the equipment.

Good Practices:

- Only speak about the matters that need to be discussed at the meeting.
- The video lab must be quiet and have no noisy distractions
- Only run the video program during the video conferencing process.

More information on video conferencing



Communication Devices

Computers and Laptops

Computers allow us to make a variety of digital communication methods possible, including: instant messaging, VoIP and video conferencing.

Wearables

Small devices that have been designed to worn or attached to your body. Examples include Smartwatches, Smart clothing and Fitness trackers.

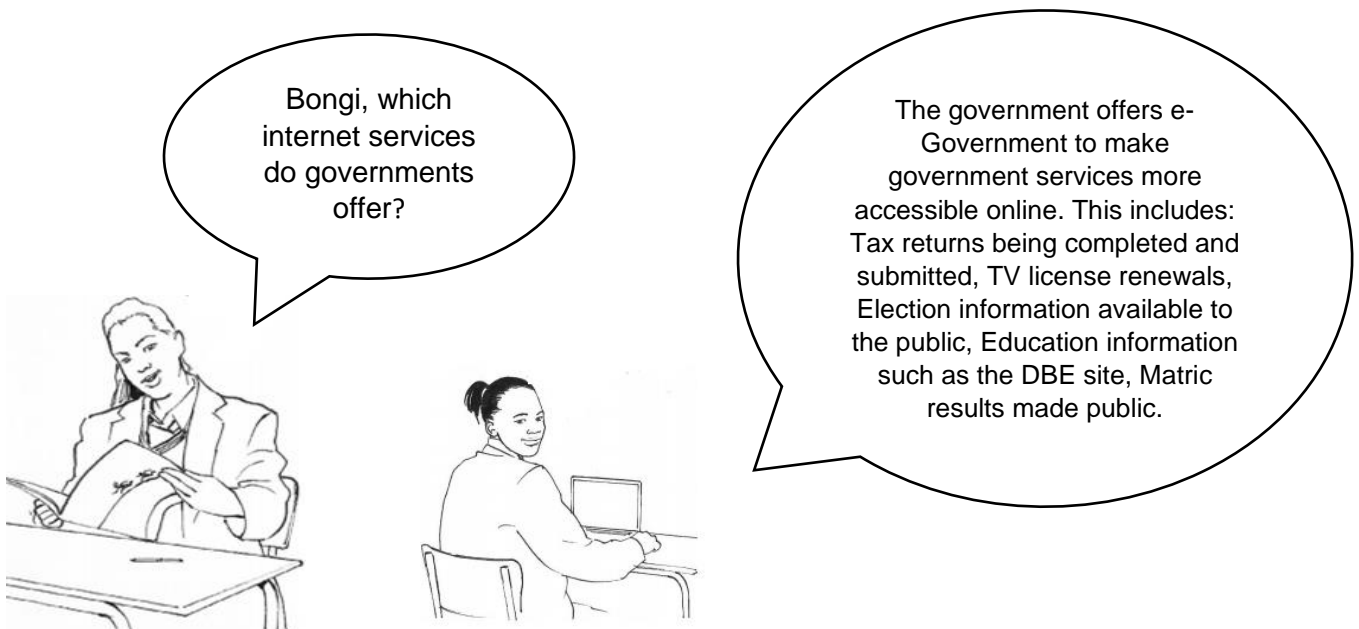
Smartphones

A smartphone is a type of computer that people can carry around. A smartphone is an example of convergence (multiple/various technologies combined into a single device). A smartphone has various functions, including the following: GPS, MP3 player, Video and sound recorders, etc.

Tablets

Tablets are portable hand-held computing devices that are bigger than smartphones, but smaller than laptops. There are two types of tablets: consumer tablets and PC tablets.

Government Internet Services and information such as tax returns, TV license payments and election information



Features of web browsers

Blocking websites

Blocking websites is when an internet proxy or firewall prevents a user from gaining access to certain network resources such as certain websites or FTP Servers. One would block certain websites to avoid phishing websites, to avoid spam disturbing your computer with adware and popups or to add parent filters to content for children.

Examples include most antivirus software which uses software filters to block unsafe websites to ensure a safe browsing experience

Learn How to Block websites



Search engines

Search engines are websites that allows you to type in a keyword or a phrase and then searches through the internet to find what you are looking for.



(Image Source: https://www.airsassociation.org/media/k2/items/cache/77977b7b6d72dcd641d05e47eb2e5f09_XL.jpg)

Browser plug-ins

Add-on software that gives a web browser additional functionality. Plug-ins allow a web browser to display additional content that was not originally designed to display.

Pop-up blocker

Pop-ups advertise products or features on websites. Advertisers design these advertisements to be eye-catching. Pop-up blockers block these advertisements.

Home Page settings

A webpage that serves as the starting point of a website. It is the default webpage that loads when you open a website.

History and Favourites

History shows a list of webpages that are visited over a period of time by category. The list contains the URLs of the websites that were visited.

Favourites can be set by a user if he/she visit these webpages regularly, so that they can easily be accessed.

Bookmarks

Bookmarks are saved shortcuts that directs a user's browser to a specific webpage, file or document. One can identify a specific website by looking at the title, URL and icon of the bookmark. Can also be called 'Favourites' or 'Starred'.

Caching

Caching is the temporary storage of web documents that you have visited to reduce bandwidth usage, server load and lagging.

How to create a bookmark



Uses of computer communications

RSS Feeds

Really Simple Syndication are text files designed to deliver regular internet content and news updates to subscribers. One can download RSS readers that will give you automatic updates on new content on your browser.

Podcasts/Vodcasts

A **podcast** is a free service that allows internet users to pull audio files from a podcasting website to listen to on their computers or audio players. A **vodcast** allows users to pull video files from a podcasting website.

Chatrooms

A website or an online service that provides an online virtual space for users with a common interest to communicate in real time. Examples include: Badoo, Rawr and ICQ

Social Networking

Social networking sites are interconnected online communities which help people make contacts that would benefit their social and/or professional needs.



(Image Source: https://makeawebsitehub.com/wp-content/uploads/2016/04/social_media.jpg)

Wikis

Wikis are used to obtain and share information with other users. The websites can be edited and access by any user in the world, so long as that person has a computing device and an internet connection. Examples include, Wikipedia, WikiTravel, WikiHow and WikiBooks.

Blogs/Vlogs

A **blog** is a diary-type website that maintains an ongoing record of information and has the function of a journal. A **vlog** is a blog that contains video content.

Advantages	Disadvantages	Good practices
You can share your knowledge	Posting personal information online can be dangerous	Keep your blog exciting to draw peoples' attention
One can learn new things	Certain blogs need to be private or require logins because of sensitive content	Post regularly on your blog – always keep it updated
Increases search engine traffic.	Blogs and vlogs lack many important plugins that can improve the functionality of your site	

Examples include:



WordPress



Blogger



Weebly



Wix



How to write a blog

Digital Communication

Strengths of Digital Communication	Weaknesses of Digital Communication
Very fast over short and long distances	Difficult to prove that a digital communication is from the person it says it's from
Much cheaper than postal services, e.g. schools' SMS systems	Sometimes it is difficult to separate your social life from your work life
Data, videos and audio can be uploaded at the same time	Hackers, crackers and fraudsters misuse digital communication to harm others

Advantages	Disadvantages	Limitations
Contributes towards green computing	Equipment such as smartphones and microwave towers may not look pleasant in the environment	Electromagnetic fields and radio signals can interfere with wireless communication
Files can be saved or shared electronically	Many people do not have computer skills	
Allows for worldwide collaboration	Some people may become addicted to cyber activities, which leads to anti-social behaviour	

Bluetooth

Bluetooth is a wireless technology that uses radio waves to communicate, or transmit data or voice over a short distance.

Advantages:

- Widely used
- Free of charge
- No need for any cables

Disadvantages

- It drains battery power of a device
- Little security.
- Slow data transmission speed.



(Image Source: <https://2.bp.blogspot.com/-7Y-LzHDenFE/VQvsPB9itWI/AAAAAAAAANg/mtvQMq9Bkr0/s1600/bluetooth-marketing.jpg>)

Wi-Fi Hotspots

An **area** where you can connect wirelessly to a network with internet access. Many companies use Wi-Fi hotspots to attract more customers (such as KFC). Hotspots are usually found at places such as, restaurants, shopping malls, airports and other public places.

A video explaining WiMAX



WiMAX

Worldwide Interoperability for Microwave Access is a wireless communication standard to describe long-range wireless networking for mobile and fixed internet connections.

Global Positioning System (GPS)

A **GPS** uses satellite-based radio navigation in order to determine where you are in the world. The information can be used to navigate to a different destination or to let other people know where you currently are.

Advantages	Disadvantages
Are available from anywhere in the world.	GPS Devices uses a lot of power.
Can be used to locate a person.	Signal might be affected by weather.
Software is always up-to-date.	GPS accuracy depends of the strength of the signal.



(Image Source: <https://i3.wp.com/www.digitbin.com/content/uploads/Inaccurate-and-wrong-Google-maps-GPS-for-Android.png>)

Internet Attacks

DoS attacks

Denial of Service attacks are attacks where a computer is bombarded with huge amounts of data to slow down a computer network.

Sniffer attacks

A small program that can read packets of data being sent on a computer or a network.

Encryption is a process where data is translated into a secret code for secure transmission.

Internet Technologies Activities

Activity 1

1. Define the term digital communication.
2. How can video conferencing influence communication in business?
3. Provide TWO advantages and TWO disadvantages of video conferencing.
4. Describe the function of an RSS feed.
5. Differentiate between a podcast and a vodcast.
6. What are wikis?

Activity 2

1. Briefly define each of the following terms:
 - a. Caching
 - b. Smartphones
2. Name any TWO web browser plug-in applications.
3. What is the main function of GPS technology?
4. Which of the following options is NOT a social networking site?
 - A. Facebook
 - B. Snapchat
 - C. Instagram
 - D. WhatsApp
5. Why would a DoS attack be performed?
6. Define the term sniffer attacks.

Activity 3

1. What does the term encryption mean?
2. State TWO netiquette rules for a group chat on social media.
3. Most learners use mobile devices to browse the Web,
 - a. Some learners confuse the terms internet and World Wide Web. Explain the terms internet and World Wide Web.
 - b. What term is used to describe the concept where a learner is able to use more than one app on the same device at the same time?
 - c. Give ONE reason why a web page does not open in the browser on a mobile device.

4. State ONE argument against accessing the internet using a public Wi-Fi hotspot.
5. Which ONE of the following statements is NOT true about web applications?
 - A. One may have to pay for the service.
 - B. More than one person can work on a document at the same time.
 - C. One does not need an Internet connection to access the resources.
 - D. Data can be synced across multiple devices.
6. Indicate whether the following statement is TRUE/FALSE. Rewrite the correct underlined word if the statement is FALSE.
A DoS attack occurs when a computer or network is flooded with a huge amount of useless data.
7. Give ONE reason why one would install a browser plug-in.

Activity 4

1. How would an RSS feed on a blog benefit its users?
2. Suggest TWO ways in which a user can listen to music on a smartphone that has no headphone jack (port).
3. Name ONE type of technology that uses radio waves for data transfer.
4. State TWO advantages of purchasing from an online shop, other than potentially lower prices.
5. Explain the significance of the text 'mobi' in the URL 'www.vicbayfm.mobi'.
6. Which hardware or software technology is often used to control and monitor access between a network and the Internet?

Activity 5

1. Indicate whether the following statement is TRUE/FALSE. Rewrite the correct underlined word if the statement is FALSE.
A blog is an area in a place such as a café, hotel or airport where people can connect to the Internet via Wi-Fi-enabled devices.
2. Name TWO Internet technologies that can be used to reduce the monthly telephone bill of a company.
3. The 'bookmarks'/'favourites' and 'history' features on web browsers can be used to find a website that was previously visited.
Give TWO reasons why it might be better to use the 'bookmarks'/'favourites' feature to 'remember' a previously visited website as opposed to using the 'history' feature.
4. An online service or technology that makes it possible for people who share similar interests to communicate with each other regardless of distance or time.

- A. Instant messaging
 - B. RSS feeds
 - C. Social networks
 - D. Wireless networks
5. Indicate whether the following statement is TRUE or FALSE:
Public hotspots allow users to connect to the internet using 4G.
6. The term used for marketing, buying and selling products or services over the internet
- A. netiquette
 - B. e-Commerce
 - C. EFT
 - D. Torrent

Activity 6

1. Give TWO reasons why more people are currently using Skype than in the past.
2. Give ONE reason why the video and sound quality is sometimes poor when using Skype to make a video call.
3. Suggest ONE way in which the sound quality of a VoIP call can be improved without ending the session or changing any hardware.
4. ... is an example of an e-commerce website.
 - A. YouTube
 - B. eBay
 - C. Spotify
 - D. iCloud
5. Why would you use or need browser plug-ins?
6. Give ONE common example of a browser plug-in.

Activity 7

1. Name ONE technology that can be used to improve security while one is using the Internet.
2. Give TWO reasons why you would block pop-ups.
3. What is the purpose of the 'History' button or tab in a web browser?
4. Give TWO reasons why an e-shop would ask customers to log on using a password?
5. A multimedia file downloaded from the Internet that can be transferred to computer or portable media players.
 - A. wiki
 - B. vlog

- C. chatrooms
 - D. podcast
6. Which ONE of the following refers to the process of speeding up access to previously accessed data such as a web page?
- A. Caching
 - B. Refreshing
 - C. Downloading
 - D. Searching
- (1)

Internet Technologies Past Exam Papers

November 2018

1. State TWO netiquette rules for a group chat on social media. (2)
2. Most learners use mobile devices to browse the Web. 9.1.1
 - a. Some learners confuse the terms internet and World Wide Web. Explain the terms internet and World Wide Web. (2)
 - b. What term is used to describe the concept where a learner is able to use more than one app on the same device at the same time? (1)
 - c. Give ONE reason why a web page does not open in the browser on a mobile device. (1)
 - d. State ONE argument against accessing the internet using a public Wi-Fi hotspot. (1)

March 2018

1. Which ONE of the following statements is NOT true about web applications?
 - A. One may have to pay for the service.
 - B. More than one person can work on a document at the same time.
 - C. One does not need an Internet connection to access the resources.
 - D. Data can be synced across multiple devices. (1)
2. Indicate whether the following statement is TRUE/FALSE. Rewrite the correct underlined word if the statement is FALSE. (1)
A DoS attack occurs when a computer or network is flooded with a huge amount of useless data.
3. Give ONE reason why one would install a browser plug-in. (1)
4. How would an RSS feed on a blog benefit its users? (1)

November 2017

1. Suggest TWO ways in which a user can listen to music on a smartphone that has no headphone jack (port). (2)
2. Name ONE type of technology that uses radio waves for data transfer. (1)

March 2017

1. State TWO advantages of purchasing from an online shop, other than potentially lower prices. (2)
2. Explain the significance of the text 'mobi' in the URL 'www.vicbayfm.mobi'. (1)
3. Which hardware or software technology is often used to control and monitor access between a network and the Internet? (1)

November 2016

1. Indicate whether the following statement is TRUE/FALSE. Rewrite the correct underlined word if the statement is FALSE.
A **blog** is an area in a place such as a café, hotel or airport where people can connect to the Internet via Wi-Fi-enabled devices. (1)
2. Name TWO Internet technologies that can be used to reduce the monthly telephone bill of a company. (2)
3. The 'bookmarks'/'favourites' and 'history' features on web browsers can be used to find a website that was previously visited.
Give TWO reasons why it might be better to use the 'bookmarks'/'favourites' feature to 'remember' a previously visited website as opposed to using the 'history' feature. (2)

March 2017

- 1.1 Your school wishes to order books online.
 - 1.1 State TWO advantages of online shopping, other than potentially lower prices. (2)
 - 1.2 Why do some people prefer paying for online purchases using EFT, rather than paying by card? (1)
 - 1.3 List ONE measure banks use to protect their clients when they bank online. (1)
- 2.2 During Internet surfing, the warning "Pop-up blocked" often appears.
 - 2.2.1 What is a *pop-up*? (1)
 - 2.2.2 It is advisable to block pop-ups. Motivate the statement by giving ONE reasonable motivation. (1)
3. Explain what the term *trending* is in relation to social networking? (1)
4. Discuss TWO advantages of connecting computers within a network. (2)

November 2016

Computers and computer equipment are connected in a LAN. There are, however, some concerns about security and privacy.

1. Caching is one of the features that helps us to use the Web more efficiently.
 - 1.1 Briefly explain what caching is. (1)
 - 1.2 Give TWO main reasons for using web cache. (2)
2. You have the option to connect to a network via Bluetooth. Give TWO reasons why Bluetooth is not a very good option. (2)
3. What is the disadvantage of Diginet? (1)
4. Video conferencing is the meeting between two or more people via the Internet. Name TWO good practices for video conferencing. (2)
5. During the school holidays you took a lot of photos. These are stored on an SD card and the size of all the photos is a total of 3Gb. Your friend in Cape Town wants to see your photos and suggested that you upload it to the cloud. Give TWO reasons why you would hesitate to do this. (2)
6. Real-time messaging is live, text-based communication facilities that allow people to communicate using computers, cell phones, etc. in real time. Give THREE advantages of real time messages? (3)
7. Wi-Fi hotspots are used by shops and businesses to attract customers. Give TWO reasons why a shop would ask customers to log on using a password. (2)

November 2014

1. Name a function or feature of a web browser that would allow a user to return to a specific website even if the browsing history has been deleted. (1)
2. Explain how software developers generate a profit from adware, even though it is distributed for free. (1)
3. State TWO advantages of podcasts over real-time streaming broadcasts. (2)
4. a. Web browsers use a technology called web caching. What is *web caching*? (2)
b. State TWO possible advantages of using web caching. (2)
5. Describe TWO ways in which available bandwidth plays a role when watching videos online from services like YouTube. (2)

Internet Technologies Solutions

Activity 1

1. Digital communication occurs when computing devices transfer data between each other.
2. Communication has become convenient between colleagues who live in different locations.
3. Any TWO of the following:

Advantages (Any TWO of the following)	Disadvantages (Any TWO of the following)
Can save money on traveling costs.	Expensive to setup and maintain a video conferencing lab. One needs a fat internet connection.
Video and audio information can be shared.	A power failure or network failure can cause a break in communication

4. An RSS feed is a service designed to deliver regular internet content and news updates directly to subscribers.
5. A **podcast** is a free service that allows internet users to pull audio files from a podcasting website to listen to on their computers or audio players.
A **vodcast** allows users to pull video files from a podcasting website.
6. Wikis are used to obtain and share information with other users. The websites can be edited and access by any user in the world, so long as that person has a computing device and an internet connection.

Activity 2

1. a) Cache memory is an area of memory that stores frequently used data or instructions.
b) Smartphones are internet-enabled so you can send and receive e-mails and surf the internet
2. QuickTime
Java
Flash Player
3. GPS technology allows the devices to receive and send signals
4. D

5. To slow down a computer or network as much as possible, to a point where the system may even crash.
6. A small program that can read packets of data being sent on a computer or a network.

Activity 3

1. Encryption is a process where data is translated into a secret code for secure transmission
2. Any TWO of the following:
Do NOT ...
 - share personal and sensitive information
 - share information without permission
 - gossip/engage in cyberbullying
 - be rude/start an argument/be verbally abusive/swear
 - type in capital letters
 - have a private conversation on a group chat/post messages intended for one individual only on the group chat
 - send large attachments/content that wastes data
 - post information that is outside the usual content of the group/ make irrelevant comments
 - post messages at unusual hours of the day unless urgent
 - use a commonly understood language

3. a) **The internet** – A worldwide connection of networks and computers/Network of networks

World Wide Web – An internet service which consists of a collection of linked electronic pages

b) Multitasking

c) Any ONE of the following:

- The mobile data has been switched off/No internet connection
- Web page not designed for/compatible with a mobile device
- The mobile phone's Wi-Fi has not been switched on/Router is off/faulty
- Data cap has been used
- Faulty web page/browser/website
- Server down/Website not available
- Mobile device's RAM is full
- Missing browser plug-ins

4. Any ONE of the following:
 - Data transfer speeds may be slow/Number of users at the same time may influence the speed of connectivity
 - Amount of time/data available to the user could be limited
 - Security – Hackers may easily intercept your activities
 - Certain sites are blocked/restricted
5. C
6. True
7. Provides additional functionality/features on websites

Activity 4

1. Updates are automatically sent to people
No need to continually visit the website to check for new information
2. Any TWO of the following:
 - Connect speakers via Bluetooth
 - Use Chromecast/Use Wi-Fi
 - Via USB cable
 - Using the device's speaker
3. Any ONE of the following:
 - Wi-Fi/Wi-Max
 - NFC/RFID
 - Satellite
 - Bluetooth
 - 3G/LTE
4. Any TWO of the following:
 - Delivery to your home/No need to leave your home/Safer than going to a shop/More convenient
 - Can do your shopping from any device connected to the Internet
 - Can easily compare specifications/prices/easier to find specific item
 - Can see recommendations/choices of other customers
 - Much wider variety of items to choose from/Can buy from overseas shops
 - Saves on travelling costs when doing shopping, etc.
5. It indicates that the website is designed for viewing on mobile devices/smaller screens
6. Firewall

Activity 5

1. False, Wi-Fi hotspot
2. Any TWO of the following:
 - VoIP
 - Instant Messaging
 - Social Networking
 - E-Mail

(Accept valid examples for each of the above e.g. Skype/Google Hangouts, WhatsApp/WeChat, Facebook/Google+, Outlook/Gmail, etc.)
3. Any TWO of the following:
 - Bookmarks/Favourites are only the addresses a user has chosen to record/History records all pages visited
 - Bookmarks/Favourites are categorised (Easier to search) /History is recorded chronologically (longer to search)
 - The History can be accidentally cleared
4. C
5. False
6. B

Activity 6

1. Any TWO of the following:
 - Lower cost in comparison to usual calls
 - VoIP-capable devices are readily available
 - Internet services have become more accessible
 - Data costs continue to decrease
 - Greater need/influence of social networking
 - Software is mostly free
 - Facilitates video conferencing/Saves travel costs.
2. Not enough bandwidth/Too many users on one connection
Slow poor connection
3. Check and close any applications using the available bandwidth
4. B
5. To extend the functionality of a browser/View multimedia effects.
6. Any ONE of the following:
 - Flash player

- Adobe Acrobat
- Java (script)
- QuickTime
- RealPlayer
- Shockwave Player
- Silverlight
- Windows Media Player, etc.

Activity 7

1. Any ONE of the following:
 - Security protocols
 - Digital signature
 - Digital certificate
 - Encryption/SSL
 - Firewall
 - Anti-spyware/Antivirus
 - Use Tor browsers
 - Managed routers
 - VPN
2. Any TWO of the following:
 - Could carry malware
 - Irritating/Distracting/Annoying
 - Save on bandwidth/data
3. Keeps track of pages visited
4. Any TWO of the following:
 - Access to network can be limited to only their customer
 - Reduce the possibility of network bottleneck/Users do not congest the network/All users get a fair share of use.
 - To limit internet access costs for the business
5. D
6. A

Internet Technologies Past Exam Papers Solutions

November 2018

1. Any TWO of the following: ✓✓

Do NOT ...

- share personal and sensitive information
- share information without permission
- gossip/engage in cyberbullying
- be rude/start an argument/be verbally abusive/swear
- type in capital letters
- have a private conversation on a group chat/post messages intended for one individual only on the group chat
- send large attachments/content that wastes data
- post information that is outside the usual content of the group/ make irrelevant comments
- post messages at unusual hours of the day unless urgent
- use a commonly understood language

2. a) **The internet** – A worldwide connection of networks and computers/Network of networks ✓ **World Wide Web** – An internet service which consists of a collection of linked electronic pages ✓

b) Multitasking ✓

c) Any ONE of the following: ✓

- The mobile data has been switched off/No internet connection
- Web page not designed for/compatible with a mobile device
- The mobile phone's Wi-Fi has not been switched on/Router is off/faulty
- Data cap has been used
- Faulty web page/browser/website
- Server down/Website not available
- Mobile device's RAM is full
- Missing browser plug-ins

d) Any ONE of the following: ✓

- Data transfer speeds may be slow/Number of users at the same time may influence the speed of connectivity
- Amount of time/data available to the user could be limited
- Security – Hackers may easily intercept your activities
- Certain sites are blocked/restricted

March 2018

1. C ✓
2. True ✓
3. Provides additional functionality/features ✓ on websites
4. Updates are automatically sent to people
No need to continually visit the website to check for new information (Any ONE ✓)

November 2017

1. Any TWO of the following: ✓✓
 - Connect speakers via Bluetooth
 - Use Chromecast/Use Wi-Fi
 - Via USB cable
 - Using the device's speaker
2. Any ONE of the following: ✓
 - Wi-Fi/Wi-Max
 - NFC/RFID
 - Satellite
 - Bluetooth
 - 3G/LTE

March 2017

1. Any TWO of the following: ✓✓
 - Delivery to your home/No need to leave your home/Safer than going to a shop/More convenient
 - Can do your shopping from any device connected to the Internet
 - Can easily compare specifications/prices/easier to find specific item
 - Can see recommendations/choices of other customers
 - Much wider variety of items to choose from/Can buy from overseas shops
 - Saves on travelling costs when doing shopping, etc.
2. It indicates that the website is designed for viewing on mobile devices/smaller screens ✓
3. Firewall ✓

November 2016

1. False, WiFi hotspot ✓

2. Any TWO of the following: ✓✓

- VoIP
- Instant Messaging
- Social Networking
- E-Mail

(Accept valid examples for each of the above, e.g. Skype/Google Hangouts, WhatsApp/WeChat, Facebook/Google+, Outlook/Gmail, etc.)

3. Any TWO of the following: ✓✓

- Bookmarks/Favourites are only the addresses a user has chosen to record/History records all pages visited
- Bookmarks/Favourites are categorised (Easier to search) /History is recorded chronologically (longer to search)
- The History can be accidentally cleared

March 2017

- 1.1
- Delivery to your home/No need to leave your home/Safer
 - than going to a shop/More convenient
 - Can do your shopping from any device connected to the Internet
 - Can easily compare specifications/prices/easier to find specific item
 - Can see recommendations/choices of other customers
 - Much wider variety of items to choose from/Can buy from overseas shops
 - Saves on travelling costs when doing shopping, etc. ✓✓ (Any 2)
- 1.2 Wary of giving out card details / card details can be more vulnerable / identity theft risk (NOTE: not just 'safer') ✓
- 1.3
- Use of once-off/per session passwords sent to a cellphone
 - Automatically logging off after a fixed time period
 - Passwords/Pin numbers
 - SMS notification of transactions
 - Secure protocols such as SSL
 - Warnings of latest scams
 - On-screen keypads for entering pin numbers, etc. ✓ (Any 1)
- 2.2.1 Pop-up are windows usually of advertisements that appear automatically without your permission when you are on the internet ✓
- 2.2.2
- Pose security threats
 - Irritation/interfere with concentration/interrupts/productivity decreases
 - Using cap ✓ (Any one)
3. Trending refers to popular topics and hash tags that are being talked about on social media. ✓
- 4.
- Files can be accessed from any computer in the network.
 - Files can be transferred without the use of portable devices.

- Software can be shared by users.
- Hardware such as printers can be shared by users.
- Increased security
- Internet connection can be shared by many users.
- All programs can be installed and updated from a single location.
- Internet access can also be controlled.
- Facilitating communication

✓ ✓ (Any two)

November 2016

- 1.1
- Caching is memory that stores frequently used data, instructions or webpages so that they display more quickly when they are opened again ✓
- 1.2
- Reduces bandwidth usage ✓
 - Allow previous visited pages or data used to load quicker ✓
- 2.
- Transfer speed of data is slow ✓
 - Limited range ✓
 - Limited number of devices that can connect
- (Any two)
- 3.
- Expensive ✓
- 4.
- Make sure you work in a venue that is well lit (not too dark) ✓
 - Protect your privacy by making sure you know what your camera can "see" ✓
 - Test the sound and video before you make a call
- (Any two)
- 5.
- High cost of data ✓
 - Bandwidth limits ✓
 - Limited space on Cloud
 - Security issues
- (Any two)
- 6.
- Cost effective - some services are free ✓
 - You can chat with more than one person at a time ✓
 - You can indicate to your contacts that you are "available" ✓
 - Some applications can be used on different operating systems
- (Any three)
- 7.
- Access to network can be limited to only their customers ✓
 - Reduce the possibility of network bottleneck/Users do not congest the network/All users get a fair share of use ✓
 - To limit internet access costs for the business
- (Any two)

November 2014

1. Use a bookmark/favourite ✓
2. Advertisers pay the developer to show their advertisements within the app/program using banners or pop-ups ✓
3.
 - Listen at a time suitable to you
 - Better quality sound
 - Save on data (using a less expensive Wi-Fi connection for downloads)
 - Avoid streaming issues, e.g. buffering
 - Podcasts can easily be distributed, etc. ✓✓ (Any TWO)
4. a. Web caching is a process where web pages previously accessed ✓ are stored on the hard drive ✓
 - b.
 - It improves browsing speed as pages can be loaded from the hard drive instead of being downloaded from the Internet ✓
 - Less data is consumed during the browsing process, as cached websites are not downloaded from the Internet ✓
5.
 - More bandwidth – better quality video
 - More bandwidth – smooth playback
 - Lower bandwidth can make watching videos online impossible
 - More bandwidth – one can get 'capped' quicker as higher bandwidth allows users to stream in higher quality, which uses more data, etc. ✓✓ (Any TWO)

Summary of Network Technologies

Wide Area Network (WAN)

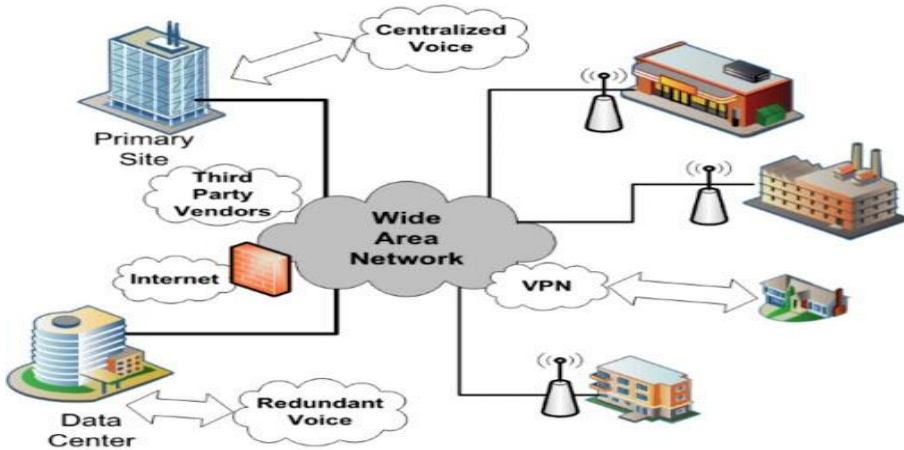
A wide area network is a network that connects computers over a wide area such as a city or province. A WAN uses: cables, radio waves, microwaves and satellites as communication methods.

Purpose of WAN:

- To connect LANs together
- Allows communication to take place over a large distance.
- Centralisation of shared data

Advantages and Disadvantages of WANs

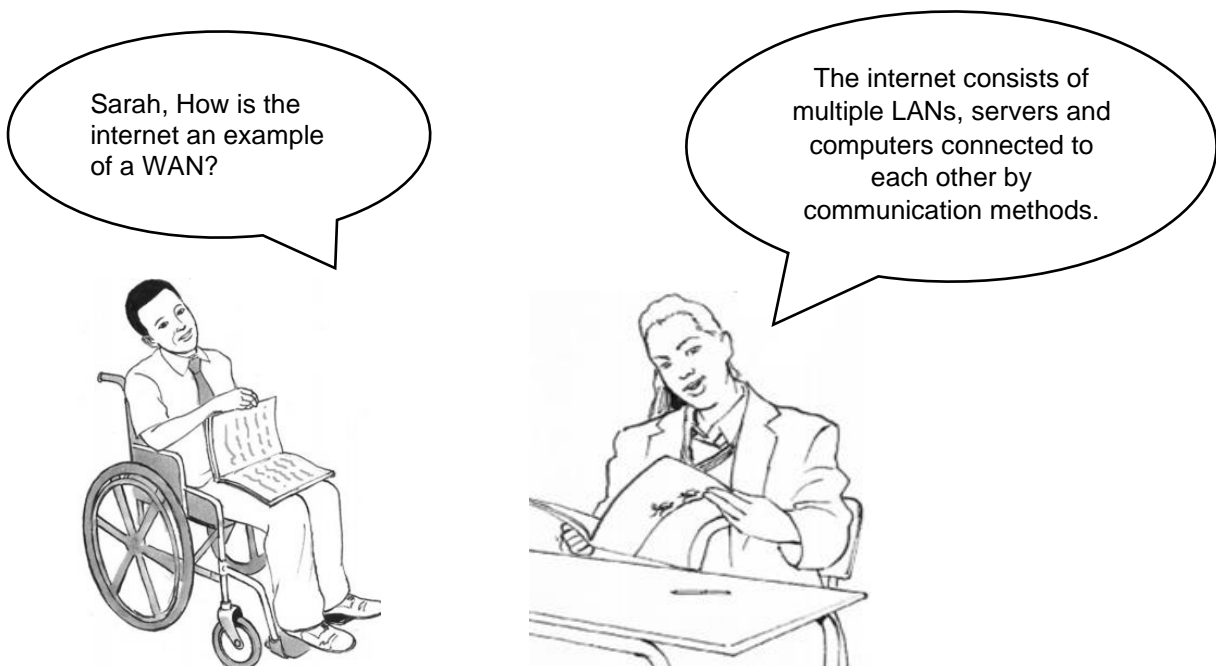
Advantages	Disadvantages
Allows sensitive data to be shared over a wide distance	It is very expensive to setup and maintain the network
Multiple LANs can be connected so that large companies can communicate.	Security issues such as information theft.



For more information on WANs scan me:



(Image source: <https://images.app.goo.gl/QWTzCuawBrH2oh5w5>)



Network devices:

Modem: Hardware device that allows a computer to send and receive data over a telephone line, satellite or cable.

Switch: Allows multiple devices on a network to communicate.

Router: A device that connects a network to other networks wirelessly or through cables.

Internet Services

The internet is a wide area network that can be accessed from any computing device (Computers Smartphones, etc.), as long as the computing device is connected to the internet.

Real-Time Messaging - Instant Messaging (IM)

Online chat programs that allow a user to send messages (text and multimedia) in real-time over the internet. Examples include: WhatsApp Messenger, WeChat and Telegram.

Advantages

- Allows users to chat in “real time”
- Messages are delivered to the other party instantly after pressing the send button.
- One can see when messages have been read.
- Communication can take place regardless of distance

Disadvantages

- No time to review messages you are sending
- Messages are not always saved
- The personal experience of talking to people is taken away due to instant messaging

Voice over Internet Protocol (VoIP)

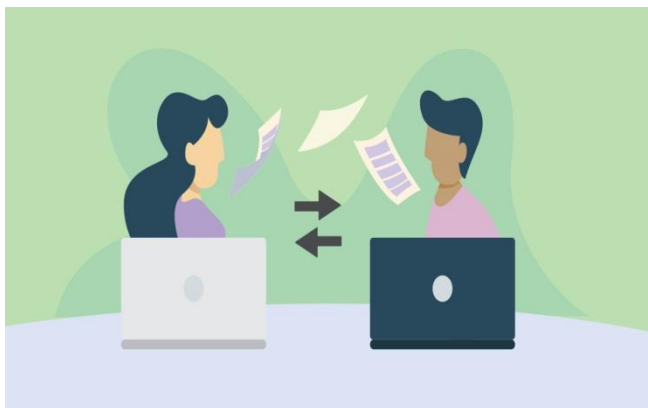
Voice sounds that are converted into data so that computing devices can transmit it over the internet. Examples include, Skype, Google Hangouts, Discord and ZoiPer.

File Transfer Protocol (FTP)

FTP is a set of rules that networked computers use to communicate to one another. It is a language on a TCP/IP network such as the internet, examples include, FileZilla.

File Sharing

Accessing or sharing of files by one or more users. For example: ShareIt, uTorrent and Xender.



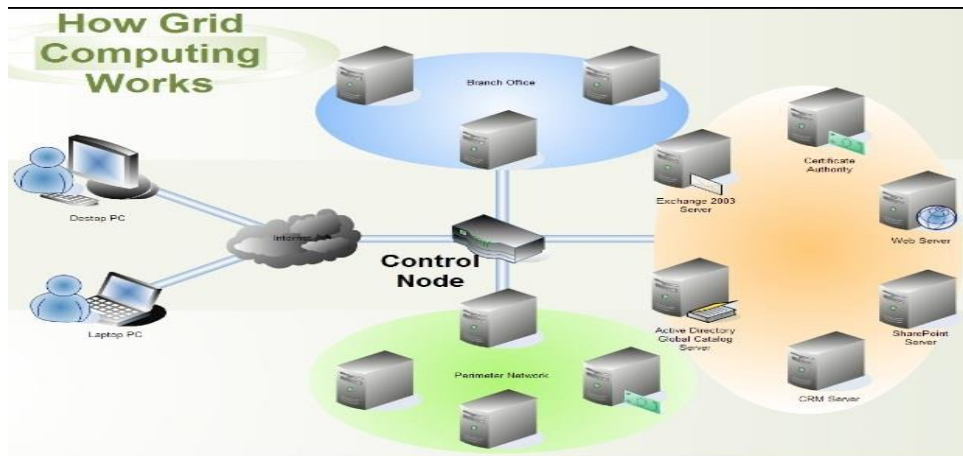
(Image Source: <https://www.sodapdf.com/blog/wp-content/uploads/2019/06/file-sharing.jpg>)

For more information on
VoIP scan me:



Grid Computing

Grid Computing refers to using different computers' resources in different locations to achieve a common goal or to solve a specific problem. Examples include Weather forecasting and Earthquake simulations.



(Image Source: <https://ecomputernotes.com/images/Grid%20Computing.jpg>)

Scan me for a video on Grid Computing



Scan me for a video on Cloud Computing



Cloud Computing

Cloud computing refers to storage and application facilities on a remote server that is connected to a network on the internet such as Google Apps and Microsoft Office Online.

Purchasing Internet Connections and Access

Types of connections

Cabled/Wired Connection (ADSL – fibre optics, UTP cables)		Wireless Connection (Bluetooth, 4G and Infrared)	
Advantages	Disadvantages	Advantages	Disadvantages
Cheaper than wireless connections	Fixed in a single location	Can be used in places where cables can't reach	Connectivity can be lost
More reliable than wireless connections – not prone to interferences	Can be difficult to set up	Can connect portable devices such as Smartphones and Tablets	Requires extra cost and equipment to set up
Faster transfer rates	Messy cables are untidy	Instant transfer of information is easier	Not all devices have wireless capabilities

Capped, Bundle

Capped refers to the limit the ISP gives to clients on the amount of data used over a certain time frame. Once a user reaches their limit (cap) a bundle can be purchased. A bundle is a specific amount of data purchased from the ISP, which might expire after a certain period

Data Transmission Speed

Data Transmission Speed refers to the speed at which data can be transferred from one device to another via a communication channel such as wires, fibre-optic cables and wireless networks.)

If the data transmission speed is high:

- Streaming of high definition videos is smooth
- Many users can use the connection at the same time without any 'lagging'
- Cloud storage will sync faster

Comparisons of transfer rates

- ADSL: Up to 15 Mbps
- 4G/LTE: Up to 50 Mbps
- Fibre: Up to 105 Mbps

Internet Service Providers (ISP)

An ISP provides businesses and individuals with internet services such as, internet access, for a monthly fee. ISPs have fast, permanent connections to the internet. Examples include: MWeb, TelkomSA, Internet Solutions, Cell C and VOX telekom.

Advantages	Disadvantages	Limitations
If cables are stolen, no additional costs will be added	ISP manages all connections	Certain areas do not have internet coverage due to no infrastructure
Installation/Maintenance is done by the ISP	CAP or line speed changes need to be done in-store	Internet connection depends on area's coverage
ISP offers regular support with any internet issues	Not all areas are covered by the ISP	

Bandwidth vs Broadband

Fatima, what is the difference between bandwidth and broadband?

Bandwidth is the amount of data that can be transferred from one point to another, whereas broadband is a high-bandwidth, high-speed connection to the internet.



Downloading and Uploading

Downloading refers to the transmission of a file from one computer to another. When downloading a file, one requests it from another computer.

Uploading refers to the process of moving files from your computer and placing them on a server so that other people can see them.

Scan me for information
on Downloading /
Uploading



Network Technologies Activities

Activity 1

1. The internet is an example of a WAN. Why can the Internet be described as a WAN?
2. Provide ONE advantage and ONE disadvantage of WANs.
3. Match the term/concept in Column B with the definition in Column A. Write down the correct term/concept next to the question number.

Column A		Column B
3.1	A device that connects network to other networks wirelessly or through cables.	Switch
3.2	Hardware device that allows a computer to send and receive data over a telephone line, satellite or cable.	Router
3.3	Allows multiple devices on a network to communicate.	Modem
		Network

4. Name TWO advantages of real-time messaging.
5. Which one of the following is NOT an example of real-time messaging apps?
 - A. FlipGrid
 - B. Telegram
 - C. WeChat
 - D. WhatsApp Messenger
6. Indicate whether the following statement is TRUE or FALSE in terms of the disadvantages of real-time messaging:
No time to review messages you are sending

Activity 2

1. Differentiate between grid computing and cloud computing.
2. Name THREE hardware components one would need to hold a video conference.
3. Define the term FTP.
4. Give an example of an FTP site.
5. What is an Internet Service Provider? Give an example of an ISP.
6. Name TWO services an ISP can provide to its customers.

Activity 3

1. What is the difference between capped and a bundle?
2. Define the concepts downloading of files and uploading of files.

3. Consider the following advertisement

- ADSL up to 10 Mbps
- 5 free e-mail addresses
- 10 GB free cloud storage
- Free ADSL router

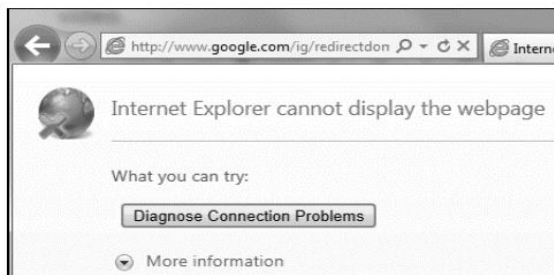
- The advertisement indicates that the maximum speed is 'up to 10 Mbps'. Give TWO possible reasons for an ADSL line not performing at its maximum speed.
 - What is the purpose of the router mentioned above?
- State TWO factors that should be carefully considered when choosing an ISP (internet service provider), other than cost.
 - Name TWO technologies/protocols that use encryption to secure communication over a wide-area network.

Activity 4

1. Consider the packages below that advertise Internet access for video streaming at home.

PACKAGE A	PACKAGE B	PACKAGE C
5 GB data Fibre 100 Mbps Free installation + Router R399 p.m.	5 GB data ADSL 2 Mbps Free installation + Router R99 p.m.	Uncapped data Fibre 40 Mbps Free installation + Router R399 p.m.

- Which package would one use to daily stream HD videos at home? Give TWO reasons for your answer.
 - Which package would be sufficient for general home use, such as sending e-mails and browsing the web, for which no video streaming is required? Motivate your answer.
2. The web browser message below is displayed even when an ADSL connection is working.



Give TWO possible reasons for receiving this message.

3. Name a device that connects a LAN to a WAN.

4. Name ONE type of technology that uses radio waves for data transfer.
5. What is the function of a network switch?

Activity 5

1. The downloading of large files has an impact on ...
 - A. ergonomics.
 - B. bandwidth.
 - C. resolution.
 - D. recycling.
2. What are FTP servers and services used for?
3. State TWO ways in which a user can convey emotions in an IM (instant messaging).
4. Suggest TWO realistic ways of ensuring that the data cap/limit on your Internet lasts the whole month without reducing the amount of time you spend on the Internet.
5. Using multiple computer systems as though they were on computer is known as...
 - A. Grid Computing
 - B. Cloud computing
 - C. Virtual computing
 - D. Scientific computing
6. Which ONE of the following roles does a computer assume when it connects to a server to use resources?
 - A. Firewall
 - B. Client
 - C. Storage
 - D. Server

Activity 6

1. Name an e-mail or IM (Instant Messaging) feature that makes it easy to see if the sent message was read or not.
2. How does a social network such as Facebook make most of its money?
3. What is needed to establish a Bluetooth connection between two devices if all the required Bluetooth options have already been enabled and correctly set on both devices?
4. State TWO potential disadvantages of using Bluetooth for communication.
5. Which communications technology or protocol allows devices to connect within a WLAN?

6. Give a general or generic term/acronym for a computer network spread over a large area such as a country.

Activity 7

1. Which of the following refers to cellular technology used for data transfer?
 - A. WiMAX
 - B. Bluetooth
 - C. WiFi
 - D. LTE
2. Why would the internet be classified as a WAN?
3. Compare the functionality of a switch and a router in a network.
4. Give an example of what NFC (Near Field Communication) can be used for.
5. Ms Mills told the learners that all networked and online computer users should make sure they make use of a firewall. Explain what a firewall is.
6. The ... is a hardware component that allows a computer to connect to and communicate via a network.
 - A. BIOS
 - B. GPU
 - C. ROM
 - D. NIC

Network Technologies Past Exam Papers

November 2018

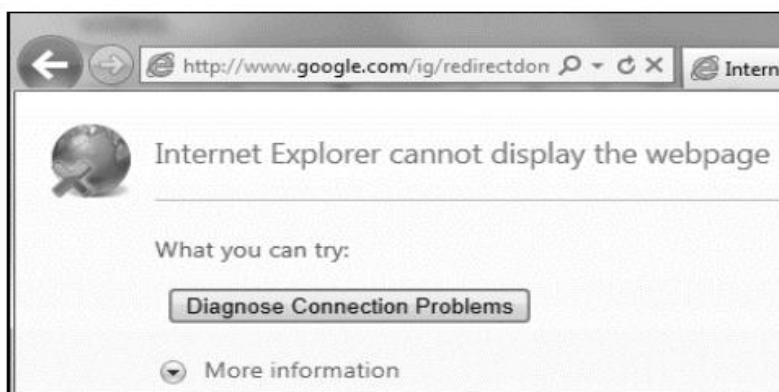
1. State TWO factors that should be carefully considered when choosing an ISP (internet service provider), other than cost. (2)
2. Name TWO technologies/protocols that use encryption to secure communication over a wide-area network. (2)
3. You use your smartphone only for instant messaging and cellphone calls. The monthly data cap of 5 GB on your smartphone has been used up before the end of the month. Give TWO possible reasons why the data cap did not last the whole month. (2)

March 2018

1. Consider the packages below that advertise Internet access for video streaming at home.

PACKAGE A	PACKAGE B	PACKAGE C
5 GB data Fibre 100 Mbps Free installation + Router R399 p.m.	5 GB data ADSL 2 Mbps Free installation + Router R99 p.m.	Uncapped data Fibre 40 Mbps Free installation + Router R399 p.m.

- a) Which package would one use to daily stream HD videos at home? Give TWO reasons for your answer. (3)
 - b) Which package would be sufficient for general home use, such as sending e-mails and browsing the web, for which no video streaming is required? Motivate your answer. (2)
2. The web browser message below is displayed even when an ADSL connection is working.



- a) Give TWO possible reasons for receiving this message. (2)

November 2017

1. Name a device that connects a LAN to a WAN. (1)
2. Name ONE type of technology that uses radio waves for data transfer. (1)
3. What is the function of a network switch? (1)
4. The Internet is increasingly being used to make voice calls
 - a) Give an example of a program that supports VoIP, other than Skype. (1)
 - b) Why is it not recommended to use VoIP for emergency calls? (1)
 - c) Why would a user reduce the quality of VoIP calls? (1)

March 2017

1. The downloading of large files has an impact on ...
 - A. ergonomics.
 - B. bandwidth.
 - C. resolution.
 - D. recycling. (1)
2. What are FTP servers and services used for? (1)
3. State TWO ways in which a user can convey emotions in an IM (instant messaging). (2)

DBE November 2016

1. Suggest TWO realistic ways of ensuring that the data cap/limit on your Internet lasts the whole month without reducing the amount of time you spend on the Internet. (2)

November 2015

- 1.1 Your cousin is moving out of the house soon and has started investigating connectivity options. She is considering the following packages:

Package 1	Package 2	Package 3
Uncapped ADSL Free Data after hours (24:00 – 08:00) Up to 2Mbps Semi-shaped	15GB 3G / LTE on Cell C Data only SIM No out-of-bundle rates 3 month Data Rollover	200GB Cap Fibre Up to 4Mbps Unshaped data No contracts

- 1.1.1 What does the term *uncapped* for package 1 mean? (1)

- 1.1.2 Explain why you would never be throttled on package 2 or 3? (1)
- 1.1.3 What does it mean when your internet connection is shaped? (2)
- 1.1.4 Which one of these packages has the highest speed? (1)
- 1.1.5 Refer to package 2: What does out-of-bundle rates refer to? (1)

November 2012

1. Mr Joe has networked all the computers, a scanner and other devices in the computer centre.
- 1.1 Name ONE media category that Mr Joe could have used to connect the computers. (1)
- 1.2 What is the purpose of a switch in a network? (1)
- 1.3 Name TWO devices, other than computers and a scanner that can be shared in a network. (2)
2. Mr Joe is concerned about the security of the network.
- 2.1 State TWO precautions that he can take to prevent unauthorised access to the files on the network. (2)
- 2.2 State TWO guidelines for setting up secure passwords. (2)
- 2.3 Name TWO problems directly related to hardware that may cause you to lose data. (2)
3. Mr Joe spends a lot of time setting up users and computers, fixing problems with computers and connectivity and performing other network tasks. He wants to advertise for someone to take over these tasks.
- Give the job title (designation) that should be used in the advertisement for such a person. (1)
4. Mr Joe wishes to connect the network to the Internet.
- 4.1 Suggest ONE type of broadband Internet connection.
(Do not give a brand name.) (1)
- 4.2 State ONE advantage of a broadband connection for the learners in the learning environment. (1)

Network Technologies Activities Solutions

Activity 1

1. The Internet is a very large collection of networks and computers around the world that are interconnected
2. Advantage: Allows sensitive data to be shared over a wide distance / Multiple LANs can be connected so that large companies can communicate.
Disadvantage: It is very expensive to setup and maintain the network / Security issues such as information theft.
3. 3.1 Router
3.2 Modem
3.3 Switch
4. Much cheaper than traditional communications such as telephone calls and many users can communicate at the same time.
5. A. FlipGrid
6. True

Activity 2

1. **Grid Computing** refers to using different computers' resources in different locations to achieve a common goal or to solve a specific problem.
Cloud computing refers to storage and application facilities on a remote server that is connected to a network on the internet.
2. Microphone
Headphones/Speaker
Webcam
3. FTP is a set of rules that networked computers use to communicate to one another. It is a language on a TCP/IP network such as the internet.
4. FileZila/Shareit
5. An ISP provides businesses and individuals with internet services such as, internet access, for a monthly fee. ISPs have fast, permanent connections to the internet.
Examples include: MWeb, TelkomSA, Internet Solutions, Cell C and VOX telekom
6. Internet Access
Email Services

Activity 3

1. Capped refers to the limit the ISP gives to clients on the amount of data used over a certain time frame. Once a user reaches their limit (cap) a bundle can be purchased. A bundle is a specific amount of data purchased from the ISP, which might expire after a certain period.
2. **Downloading** refers to the transmission of a file from one computer to another. When downloading a file, one requests it from another computer.
Uploading refers to the process of moving files from your computer and placing them on a server so that other people can see them.
3. a) Any TWO of the following:
 - Malware infection
 - Maintenance being performed on lines
 - Number/Size of concurrent downloads
 - Amount of people online through a certain exchange/Contention ratio
 - Connection problems at the telephone exchange/ISP problems/Damage to (underwater) cables
 - Damaged/Malfunctioning router
 - Shaping/Soft cap on an uncapped line/Line throttling, etc.b) Connects the computer/network to the Internet
4. Any TWO of the following:
 - Bandwidth/speed of connection should be high
 - Wide network coverage (Point of presence)
 - Whether there are capped and uncapped offerings
 - Variety of types of connections offered (e.g. LTE, Fibre, etc.)
 - Whether services are shaped/throttled/Revolving window
 - The services that are offered by the ISP (e.g. spam filters)
 - Reputation/Reliability of the ISP
 - Whether data is carried over into the next month
 - Whether the ISP offers an anti-virus facility
 - Whether the ISP is known for a stable connection
 - Customer support services
5. Any TWO of the following:
 - https (SSL)
 - VPN
 - VOIP

Activity 4

1. a) Package C **AND** Uncapped data, High line speed
b) Package B **AND** Less data required /Sufficient line speed/ Cost effective
2. Any TWO of the following:
 - Data cap is used up
 - Problems with the NIC
 - Line cable not connected
 - Network settings in the operating system are incorrect
 - Firewall is blocking access to a website
 - Service provider not accessible
3. Router
4. Any **ONE** of the following:
 - Wi-Fi/Wi-Max
 - NFC/RFID
 - Satellite
 - Bluetooth
 - 3G/LTE
5. Connects two or more computers/devices in a network
Directs network traffic (data) efficiently

Activity 5

1. B
2. Transferring Files
3. Any TWO of the following:
 - Emoticons/Smileys/Emojis/Icons
 - Short versions of phrases, e.g. LOL, ROTFL
 - Use capital letters when necessary, etc.
4. Any TWO of the following:
 - Avoid downloading large files/torrents often
 - Use public data access when available
 - Compress files being sent over the Internet
 - Use a browser that uses less data e.g. Opera mini, etc.
 - Limit the amount of video conferencing/Avoid heavy streaming/Do not watch YouTube videos too often/Stream videos (such as YouTube) in a lower resolution

- Configure operating system/software to download updates manually/Switch off unnecessary updates/Restrict automatic updates/Turn off mobile data when not in use/Restrict multimedia from running automatically
- Ensure nobody is piggybacking on the connection/Prevent bandwidth theft Set up notifications to alert you of high data usage
- Check/Monitor/Restrict apps that are consuming data, etc.

5. A

6. B

Activity 6

1. Read receipts/Delivery Reports/Blue ticks in WhatsApp
2. (Online) Advertising/ads
3. Pair the devices
4. Any TWO of the following:
Range is limited;
Number of devices that can be linked is limited;
Potential security issues, etc.
5. Wi-Fi/802.11 a/b/g/n/Wireless
6. Wide Area Network (WAN)

Activity 7

1. B/C/D
2. The internet is a global connection of networks/It is not linked in a small area/It spans over a wide, global area
3. Switch is a device used to connect multiple computers on a network ✓ Router is used to connect to external networks e.g. Internet
4. Any ONE of the following:
Sharing/Transferring files
Identity verification/Authentication purposes
Location-based profile automation
Can be used in payment systems
Switch devices on or off, etc.
5. Hardware and/or software (utility program) that protects a computer against harmful unauthorised access between networks or a computer and a network
6. D

Network Technologies Past Exam Papers Solutions

November 2018

1. Any **TWO** of the following: ✓✓

- Bandwidth/speed of connection should be high
- Wide network coverage (Point of presence)
- Whether there are capped and uncapped offerings
- Variety of types of connections offered (e.g. LTE, Fibre, etc.)
- Whether services are shaped/throttled/Revolving window
- The services that are offered by the ISP (e.g. spam filters)
- Reputation/Reliability of the ISP
- Whether data is carried over into the next month
- Whether the ISP offers an anti-virus facility
- Whether the ISP is known for a stable connection
- Customer support services

2. Any **TWO** of the following: ✓✓

- https (SSL)
- VPN
- VOIP

3. Any **TWO** of the following: ✓✓

- Automatic updates running in the background
- Malware/Applications/Services running in the background, e.g. too many groups, Facebook messenger, Instagram messenger, etc.
- Hotspot feature was enabled/Other devices sharing your internet access
- Too many images/videos/files are being transferred
- ISP could have made a mistake
- Bandwidth was hacked
- The data daily limit was not set
- Too many WhatsApp calls/Voice-notes were made/sent

March 2018

1. a) Package C ✓ **AND** Uncapped data, High line speed ✓
b) Package B ✓ **AND** Less data required /Sufficient line speed/ Cost effective ✓

2. Any TWO of the following: ✓✓
- Data cap is used up
 - Problems with the NIC
 - Line cable not connected
 - Network settings in the operating system are incorrect
 - Firewall is blocking access to a website
 - Service provider not accessible

November 2017

1. Router ✓
2. Any **ONE** of the following:
- Wi-Fi/Wi-Max
 - NFC/RFID
 - Satellite
 - Bluetooth
 - 3G/LTE
3. Connects two or more computers/devices in a network
Directs network traffic (data) efficiently (Any one ✓)
(Note to marker: Accept features of a managed (smart) switch that has to do with control or management of the network.)
4. a) Hangouts/Facetime/WhatsApp/Viber, etc. ✓
b) Internet connection may not be reliable
Lack of bandwidth
Destination point may not have VOIP
Difficult for emergency services to trace origin of the call (Any one ✓)
c) Prevent dropped calls **OR** Save on data/costs ✓

March 2017

1. B ✓
2. Transferring files ✓
3. Any TWO of the following: ✓✓
- Emoticons/Smileys/Emojis/Icons
 - Short versions of phrases, e.g. LOL, ROTFL
 - Use capital letters when necessary, etc.

November 2016

1. Any TWO of the following: ✓✓
 - Avoid downloading large files/torrents often
 - Use public data access when available
 - Compress files being sent over the Internet
 - Use a browser that uses less data e.g. Opera mini, etc.
 - Limit the amount of video conferencing/Avoid heavy streaming/Do not watch YouTube videos too often/Stream videos (such as YouTube) in a lower resolution
 - Configure operating system/software to download updates manually/Switch off unnecessary updates/Restrict automatic updates/Turn off mobile data when not in use/Restrict multimedia from running automatically
 - Ensure nobody is piggybacking on the connection/Prevent bandwidth theft Set up notifications to alert you of high data usage
 - Check/Monitor/Restrict apps that are consuming data, etc.

November 2015

- 1.1.1 Uncapped means that there is no limit on the amount of data ✓ that can be downloaded or uploaded ✓
- 1.1.2 Package 2 & 3 are both capped accounts ✓
- 1.1.3 On a shaped account, priority/speed ✓ is different for various services ✓
Note: Accept specific examples such as emails, web browsing, Internet banking and "normal" downloads via a web browser getting full speed and data-intensive activity such as torrenting/online gaming that gets less speed
- 1.1.4 Package 2/LTE ✓
- 1.1.5 Using more data than the bundle/package supplies ✓

November 2012

- 1.1
- Cable
 - Wireless ✓ (Any one)
- 1.2
- It is a central connection point where all the devices on the network plug in
 - Directs network traffic ✓ (Any one)
- 1.3
- Printer/multifunction device
 - Router/wireless router/Internet access points
 - Storage drives/External hard drive
 - Photocopier
- ✓✓ (Any two)
- 2.1
- Provide all users with passwords/encryption
 - Install a firewall
 - Set/restrict access rights
 - Biometric device, etc.
- ✓✓ (Any two)
- 2.2
- Use both upper and lowercase letters
 - Use a combination of numbers, letters and other characters
 - Do not use easily identifiable information, for example, name, ID numbers, etc.
 - Make the password longer than 8 characters ✓✓ (Any two)
- 2.3
- Power failure
 - Power surges
 - Hardware failure/disk crash, etc. (*Accept specific examples*) ✓✓
 - (Any two)
- 3.
- Network administrator ✓ (*Accept IT/computer technician*)
- 4.1
- ADSL
 - WiMax
 - Wi-Fi
 - 2.5G/3G/4G/LTE
 - Satellite ✓ (Any one)

- 4.2
- They can watch educational videos over the Internet/ educational gaming
 - Faster/quicker/The downloading/uploading of data will be faster
 - Permanently connected
 - (Any one)

Summary of Information Management

Managing information include, data gathering, sifting, organisation, interpretation and presenting data as information.

The point of information management is problem solving.

The information processing cycle could be divided into the following steps:

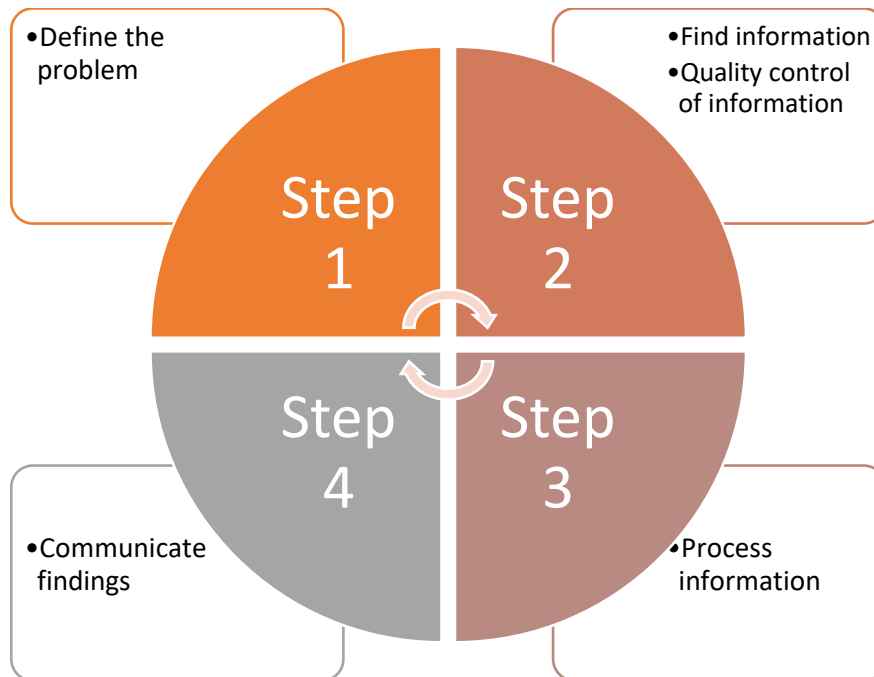


Figure 1: Information management process

Find and Access Data and Information

To be able to solve any problem quality data should be accessed and gathered.

Data versus Information

Data is a collection of raw, unprocessed facts, such as numbers, text, images, audio and video. This should be processed before it makes sense.



Data vs Information

Information is processed data. Information has been processed to make sense.



Understanding the problem

Before you start looking for information, you will need to understand the problem fully. You need to break the task into smaller parts and describe the problem and process in your own words. This is called the *task definition*.

The questions of the task definition that should be answered are:

- What is the current situation? (*Explanation of the problem in the country or area*)
- What will be the focus and purpose (desired outcome) of the investigation? (*Which angle will the investigation aim at and what will the solution be*)
- How will I go about the investigation considering all the requirements? (*Explanation of all the requirements of the problem and how they will be addressed*)
- Who is the target audience? (*Who is the solution aimed at*)

Questions and questioning



You need to know what information you need and where to find it. To be able to solve the problem, you need to ask questions.

The first question to ask is the **focus question**. A focus question is a single, precise, researchable, question that will reflect what the research is about and guide the research. This question must

be broad enough to allow for research. Focus questions cannot be answered, their answers must be "invented". The person researching must construct his/her own answers and make his/her own meaning from the data gathered, analysed and interpreted. This will create insight.



To solve the problem and answer the focus question, you need to identify more questions to help you find appropriate data and information. These are the other **research questions**.

There are two types of questions:

- open-ended
- closed-ended questions

Closed-ended questions are narrow in focus and can usually be answered with a single word such as 'Yes' or 'No' or a pick from a limited list of options. These questions are specific and may start with Who? When? Where? What? How many?

Open-ended questions are broad are questions which require more thought and more than a simple one-word answer. These higher-order questions can usually be answered in detail and may start with Why? How? What if? If? Would it be better if? What recommendation? What would be best?

Questions are further divided into four **levels** of thinking:

LEVEL	TYPE OF QUESTION	QUESTION USUALLY STARTS WITH
1	Focuses on facts	Who, When, Where, What, How many
2	Focuses on exploring	How

3	Focuses on predictions or gives alternatives	What if, If
4	Allows for judgement or helps to evaluate, critique, review or find meaning	Would it be better if, What recommendation, What would be best

Information and data gathering

Once you understand the task and asked relevant questions, you need to gather data.

Data can be gathered through:

- Electronic media: web pages, e-books, blogs, online books, articles
- Printed media: books, journals, magazines
- Social media
- Videos
- People: interviews, questionnaires

Surveys are a research method to gather people's feelings or opinions about a specific topic. **Questionnaires** are designed for a survey so that people answer the questions and can be gathered by e-mail, telephone, face-to-face, computer, online, etc.

Questionnaires should meet the following criteria:

- Instructions should guide the users in answering the questions.
- Answers to questions should not be found in other sources.
- Closed-ended questions should be asked.
- Limit the number of answers to questions.
- Questions should enable processing in a spreadsheet.
- Questions should be grouped together under relevant headings.
- The questionnaire should be professionally formatted.
- Form controls should be used to validate input.



Searching techniques

The internet contains billions of websites, thus there are huge amounts of data and information available. To search for data and information a search engine should be used.

Examples of search engines:



When searching for something on the internet you need to keep the following in mind:

- Use specific terms
- Use quotation marks for exact phrases
- Don't use common words and punctuation
- Search for only images, videos, news as specified by the search engine
- Narrow the search

Plus operator (+)

The plus operator includes those words

Hyphen (-)

A hyphen in front of a word excludes a word from the search

Inverted commas (" ")

Searches for an exact phrase

Tilde operator (~)

A tilde in front of a word returns results that include synonyms

Wildcard operator ()*

A placeholder that represents a single character or any number of characters in a search to find any formation of a word

OR operator

This operator returns results with either of two terms

Advanced searches

The advanced search refines the search by date, country, amount, language, file type, or other criteria

Quality control

During the searching process the source as well as the information should be evaluated.

Source evaluation

It is important to evaluate the sources that you are using. Some sources may contain false, contradicting and misleading information. The quality of the source must be evaluated by looking at the following:

- The date the source was created
- Whether the author was mentioned
- The date the source was updated
- Who the publisher/writer is
- The grammar, spelling and language used
- Who the source is aimed at (audience)
- The format and layout of the information

This is to ensure that source is current, valid and reliable. Only once the source has been found to be useful, the data or information can be evaluated.

Data/Information evaluation

Once the source has been approved, the data should also be evaluated by looking at the following:

Authority	The 'validity' or 'credentials' of the publisher or author(s)
Currency	The date on which the material was published or updated
Accuracy	The correspondence of the information with other sources
Objectivity	Any presence of prejudice, bias, skewing of information, et cetera
Coverage	How extensively the material covers the topic

Information sifting

Not all data found is always useful. Only relevant, valid, reliable, current and objective data will be kept. Sifting through data is the process of keeping data that will assist to solve the problem.

Process Data and Information

The sifted data now needs to be processed to become information. This can be done in different ways using software packages such as spreadsheets and databases.

Information vs knowledge



Knowledge results in an action, based on the processing of information. Once data has been processed into information and comparisons and contrasts have been made, patterns have been discovered and definitions are obtained, knowledge is gained.

Processing data

All data (questionnaire data, as well as other data) that may require the use of a spreadsheet and worksheets within the spreadsheet or database should be processed.

During processing, information is turned into knowledge.

Spreadsheets

A spreadsheet will be used to capture the questionnaire data and other information collected. The spreadsheet should be formatted so that it is easy to interpret by adding headings, using different font sizes, freezing panes, adding borders and wrapping text.

Spreadsheets are better suited when statistical and mathematical functions should be used to analyse data and present it visually by using graphs.

The following features of the spreadsheet can be used to analyse data or information:

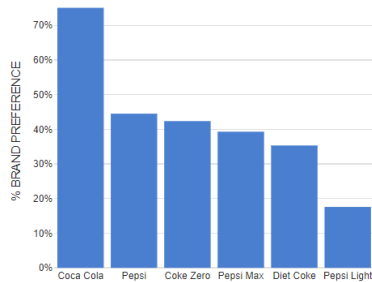
- Sorting and filtering



- Adding functions and formulae
- Creating graphs
- Using conditional formatting
- Using Subtotals

There are different types of **charts** and certain charts are better suited for certain purposes.

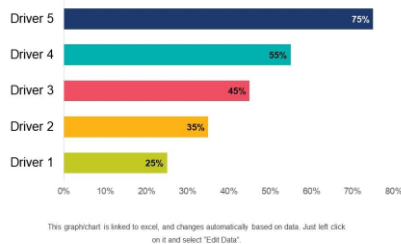
Column charts



Used to show a comparison among different items, or it can show a comparison of items over time,

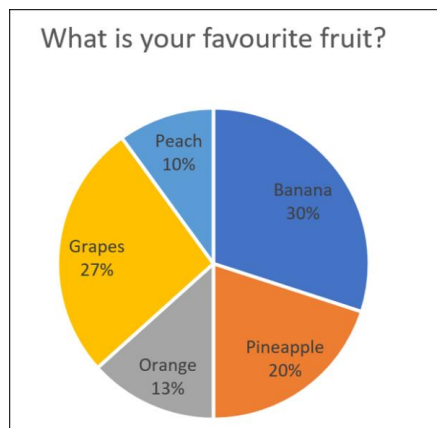
Bar charts

Increasing Efficiency Drivers With Horizontal Bar Chart



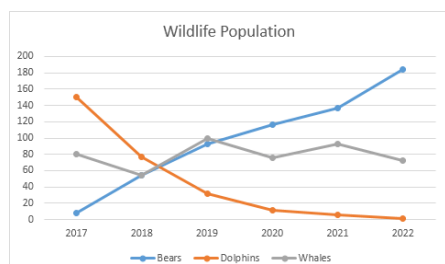
This is basically a horizontal column chart, should be used to avoid clutter when one data label is long or if you have more than 10 items to compare. This type of chart can also be used to display negative numbers.

Pie charts



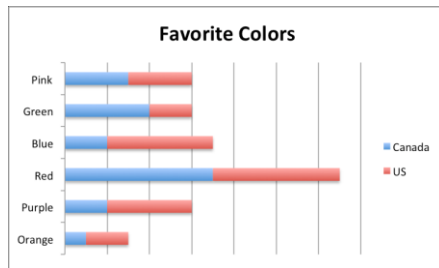
Shows a static number and how categories represent part of a whole. A pie chart represents numbers in percentages, and the total sum of all segments needs to equal 100%.

Line charts



Reveals trends or progress over time and can be used to show many different categories of data. Best use when data is continuous.

Stacked bar chart



Used to compare many different items and show the arrangement of each item being compared.

Charts should contain the following elements for easy interpretation:

- Title
- Legend
- Data labels
- Axis titles

Databases

The database will be used to analyse data that needs to be connected, which makes it easier for users to search for, and extract information from the data.

Databases are better suited when:

- there is a huge amount of data to work with
- data should be linked
- queries should be performed
- data should be presented in a formatted way in reports



Spreadsheet vs Database

The following features of the database can be used to analyse data or information:

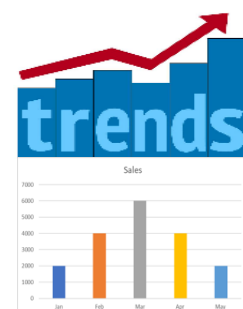
Table	Queries	Reports
<ul style="list-style-type: none"> •Data validation e.g. input masks, validation rules •Filtering •Sorting •Totals 	<ul style="list-style-type: none"> •Using operators e.g. <, >, =, >=, <=, LIKE, NOT, AND, OR •Sorting •Calculations in queries •Grouping 	<ul style="list-style-type: none"> •Grouping •Sorting •Group calculations e.g. SUM, MAX, MIN, AVG, COUNT •Report calculations e.g. SUM, MAX, MIN, AVG, COUNT

Analysing data

The final step in data analysis is to look for trends and patterns.

A **trend** is a general direction into which something is moving or developing across time. In a trend points move in the same direction.

A **pattern** is a set of data that looks similar and repeats itself in a predictable way. When presented on a graph this data forms a shape and conclusions can be drawn from that.



Present Solution

Once the data has been analysed and trends and patterns have been observed, the information should be communicated or presented. The presentation should focus on answering the focus question and communicate the findings.

Presentations can be the form of reports, websites and presentations.

Knowledge vs insight



Insight means to gain a deeper understanding of something. This can only be done once all data has been processed, analysed and knowledge have been gained by identifying trends and patterns in the information. The insights or observations obtained from the research should be communicated to an audience. This is the final purpose of the investigation.

Software to communicate findings

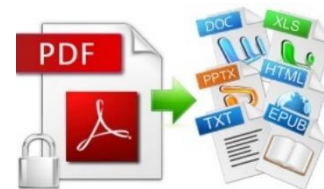
Findings can be communicated or represented in different ways such as:

- Reports
- Websites
- Presentations

Who the audience is and what the purpose of the presentation is will determine in which way the findings will be communicated.

Software should be used to create the documents to communicate the findings. Examples of software that can be used are:

- Microsoft Word for a report
- HTML editor for websites
- Microsoft PowerPoint for a presentation



Report

A report is one of the ways to present the findings. This is usually a word processing document that contains all the information, knowledge and insights obtained from the investigation organised in a logical way.



A report consists of the following:

Cover page	Contains the name of the researcher, topic and abstract. If a picture is used on the cover page, it must be suitable
Abstract	An abstract is a brief summary of the investigation and the contents of the report
Table of contents	A list of all the headings
Table of figures	A list of all the pictures, tables, graphs, visualisations
Introduction	Clearly states the focus and purpose of the investigation, pointing out which aspects were investigated
Discussion and Analysis	This is also called the body of the report and consists of headings and paragraphs that discusses the points of the investigation
Findings	Knowledge that has been gained by the investigation and claims made after the data analysis
Conclusion	A short discussion about the insights gained through the investigation
Bibliography	A list of references
Appendices	Any additional documents

Organise information

The information should be organised in a logical way in the body. The body contains the discussion and summary of the investigation. The body/discussion is made up of headings and a discussion of each heading.

The body/discussion and analysis should have the following:

- Headings that stand out from the body text
- Logical sequence and flows naturally from one heading to another
- Graphics that are relevant
- All claims made should be supported by information from spreadsheet and database
- Clearly readable fonts
- Appropriate line and paragraph spacing
- Consistent formatting

Interpret information

Charts, queries and reports have been created during the processing and analysis phase and these visualisations should now be interpreted.

Interpretation means to explain your own understanding of something.

Each visualisation that has been added to the body should be interpreted. An explanation should be added to each visualisation. Trends and patterns that have been observed can be mentioned.

Findings

Once information has been interpreted, findings are made. Findings include knowledge and insights about the evidence (charts, queries, reports).

Findings should include recommendations and new insights about the investigation.

Conclusion

A conclusion is drawn from the information and evidence and addresses the original problem or the focus question. This would summarise the main points of the investigation.

Conclusions should:

- Be logical
- Not include information that is not present in the report
- Have recommendations
- Include new knowledge and insights based on the information in the report

Referencing

The information that was used in the report should be referenced. It will show where the information was obtained. It is illegal to take someone else's intellectual property. All sources should be referenced in the APA or Harvard format.

Plagiarism is when someone passes off someone else's work as their own, without acknowledging the original source. This can be done when using someone else's words, picture, etc. without referencing the original source. All sources should be referenced at all times.

Copyright is a law that gives the owner of a work (for example, a book, movie, picture, song or website) the right to say how other people can use it. The © symbol is used when something has copyright.

Information is referenced by using a:

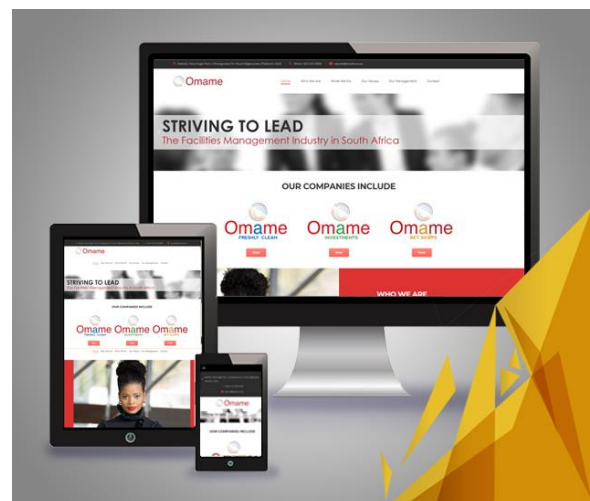
- **Bibliography** – a list of sources at the end of a report
- **Citation** – used to reference one source inside the document



Websites

Websites can also be used to communicate findings. When creating websites, the following should be considered:

- The style and content should be suitable to the audience
- Appearance should be consistent
- Colours should be pleasing and increase readability
- Font sizes should enhance readability
- Space and alignment should enhance readability
- Layout should be attractive
- Elements should be easy to locate
- Related information should be grouped together
- Graphics should be relevant and appropriately sized
- Navigation should be efficient
- Links should be functional



Information Management Activities

Activity 1

1. Your school has to gather information about which sports students like.

Study the questionnaire below and answer the questions that follow:

QUESTIONNAIRE: Which sport do you like?						
1. Choose your gender:	<input type="checkbox"/> M	<input type="checkbox"/> F				
2. Why do you like sport?	_____					
3. How many subjects do you have?	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
4. Do you enjoy Rugby and Cricket?						

- 1.1 Identify any ONE closed question in the questionnaire.
- 1.2 Why would the answer of question 2 be difficult to analyse in a spreadsheet?
- 1.3 Why is question 4 not a good survey question?
- 1.4 The questionnaire does not have instructions to users.

Why should instructions to users be included?

2. Give ONE advantage of conducting a survey online.
3. Quality data is needed for useful information to be extracted from a database.

List THREE characteristics of quality data.

4. Why would it not be a good idea to a wiki as a source.
5. What is the difference between a citation and a footnote?

Activity 2

1. Name TWO ways to verify that an internet source has:
 - 1.1 Accurate information.
 - 1.2 Current information.
2. Explain what a list of references is.

Why should a list of references be added to a report?

3. In the new technological age huge amounts of information is available at all times.

- 3.1 Give ONE advantage in using an interview to gather information.
- 3.2 Give ONE disadvantage in using an interview to gather information.
- 3.3 Give TWO advantages of using electronic forms to gather data.
- 3.4 Give TWO ways to overcome information overload.

Activity 3

1. Name TWO application software suited to process results captured from a survey if the survey consists of closed questions.

Motivate your answer.

2. Distinguish between 'plagiarism' and 'piracy'.
3. What does the © symbol indicate?
4. What is the difference between a questionnaire and a survey?
5. Give ONE element that should appear on the cover page of a report, besides the title of the report.
6. Give TWO reasons why the information of a book dealer is stored in databases rather than in spreadsheets.
7. Give TWO tips on how to check that information sourced from the Internet is in fact correct and reliable.

Activity 4

1. There is a lot of information available, and skills needed to be able to work with this information is needed.
 - 1.1 State ONE advantage of having information that is already in digital format.
 - 1.2 What is the difference between data and information?
2. Give TWO advantages of completing an electronic form in a store.
3. Study the question below that was asked in a questionnaire, and answer the questions that follow

What is the best book you ever read?

- 3.1 Is this question a closed question or an open-ended question? Motivate your answer.

- 3.2 Why would it not be easy to add a list of options to this question?
4. The contents of a spreadsheet must be imported into an Access table.

Give TWO changes that should be made to the spreadsheet before it is imported into Access.

5. Name TWO design aspects that must be considered when evaluating a website.

Activity 5

1. What makes a question a closed question?
2. Study the data obtained from a text file below.

The content should be imported into a database.

```
Name, Gender, Age, Amount  
Susan Motau, Female, 16, 500  
Kirk Key, Male, 15, 450  
Pete de Preex, 15, 200  
Thuli January, 18, 670  
Victor Naidoo, 17, 340
```

- 2.1 How many fields will the database contain of (excluding a primary key)?
- 2.2 Why would it not be advisable to have the name and surname in one field?
- 2.3 Explain the steps that you would need to take to be able to separate the name and surname from each other without manually retyping it?
3. Explain what a URL shortening service does.
4. Name the word processing feature that can be used to automatically indicate the different changes made to a document by various editors or users.
5. How can the creator of a questionnaire ensure that the questions in a questionnaire are closed questions?

Activity 6

1. Study the following two questions included in a questionnaire:

1: Which car do you drive?

- BMW
- Volkswagen
- Toyota

2: What do you think about children who drive without licenses?

Click to enter text

- 1.1 Give ONE criticism of each question with regard to the reliability of the information that will be collected.
- 1.2 Why is question 1 a closed question?
2. Which word processing feature must be applied to headings to allow them to appear in an automatic table of contents?
3. Explain how a user can benefit from the use of a URL shortening service.
4. Fake news is starting to confuse people about the real news.
 - 4.1 What is fake news?
 - 4.2 How could you verify information obtained from a website source?
5. Explain what it means to 'proofread' a final copy of a report.
Give TWO considerations.

Activity 7

1. Compare plagiarism and copyright infringement by explaining:
 - 1.1 What each offence is.
 - 1.2 How to avoid being guilty of the offence.
2. Why would you include the date when information was retrieved from websites in a bibliography?
3. State TWO general features of spreadsheets that make them suitable for data analysis.
4. Explain what a citation is.
5. Motivate why you would use a questionnaire or survey to obtain information, even if you have access to so much information on the Internet.

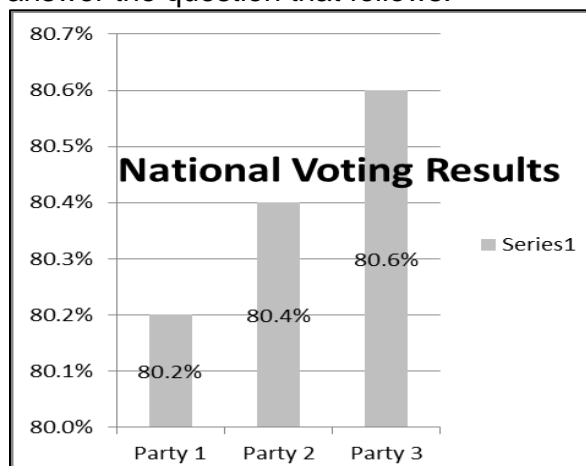
6. Explain why it is important to avoid 'double' questions such as the following in a survey:

Do you have a phone and a tablet?

Information Management Past Exam Papers

November 2019

- 6.1 Refer to a formal written report, such as your PAT, and explain the purpose of an:
- 6.1.1 Abstract (1)
 - 6.1.2 Introduction (1)
- 6.2 When you did research for your PAT, you found information on the topic that appeared to be suitable. (2)
Give TWO reasons why you CANNOT use some of this information in your report.
- 6.3 Closed questions have a set of answers to choose from.
- 6.3.1 Discuss ONE limitation of using closed questions in a questionnaire. (1)
 - 6.3.2 Give TWO benefits for a researcher when closed questions are answered electronically. (2)
- 6.4 Study the graph below that shows the final outcome of a national election and answer the question that follows.



- Give THREE reasons why it is difficult to interpret the graph (3)
[10]

June 2019

- 6.1 State TWO ways in which to find information if you do not have access to the internet. (2)
- 6.2 Give TWO reasons why a drop-down form field is used instead of a text form field on an electronic form. (2)

6.3 A student downloaded information from the following web page: (2)

	A	B	C	D	E	F	G
1	ID	Item/Venue	Field1	Date	ID	Item	Date
2	671	Keyboard, Room 60	Lower Campus	20180222	261	Graphics Card	2018/01/17
3		Room 187, Mouse	Upper Campus	4/23/2018	139	Touchpad	7/11/2018
4	873	Monitor, Room 60	Lower Campus	6/1/2018	810	Printer	31102018
5	254	Graphics Card		3/11/2018	466	Keypad	4/10/2018
6	187	USB-cable, Room 187	Upper Campus	2/15/2018	689	HDMI-port	9/21/2018
7	981	PSU, Room 35	Lower Campus	5/5/2018	834	Mouse	6/5/2018

Explain why the information may not be reliable.

6.4 Study the spreadsheet below and answer the questions that follow.

6.4.1 Identify THREE problems in this spreadsheet that will affect the quality of data when it is imported into a database. (3)

6.4.2 Other than the problems identified in QUESTION 6.4.1, why would it NOT be possible to create a meaningful graph using the data above? (1)

[10]

November 2018

6.1 The example below shows three questions that were part of a questionnaire for learners taking Mathematics as a subject at primary school.

QUESTIONNAIRE

Question 1: Did you pass Mathematics?

Question 2: How many learners in South Africa take Mathematics as a subject?

Question 3: What impact does Mathematics have on the economy?

Answer the following questions based on the questionnaire above.

6.1.1 Identify ONE open-ended question from the questions above. (1)

6.1.2 Which question (Question 1, Question 2 or Question 3) in the questionnaire is more likely to give usable data if primary school learners completed the questionnaire? (1)

6.2 State TWO ways in which a teacher can check if a learner plagiarised from the internet. (2)

6.3 Give TWO tips that learners can use to check the quality of information when researching a topic on the internet. (2)

6.4 Name TWO broad categories of spreadsheet features/options that can be used to interpret data from a questionnaire. (2)

6.5 Why do you need a citation in the body of a research report and a bibliography at the end of a research report? (2)

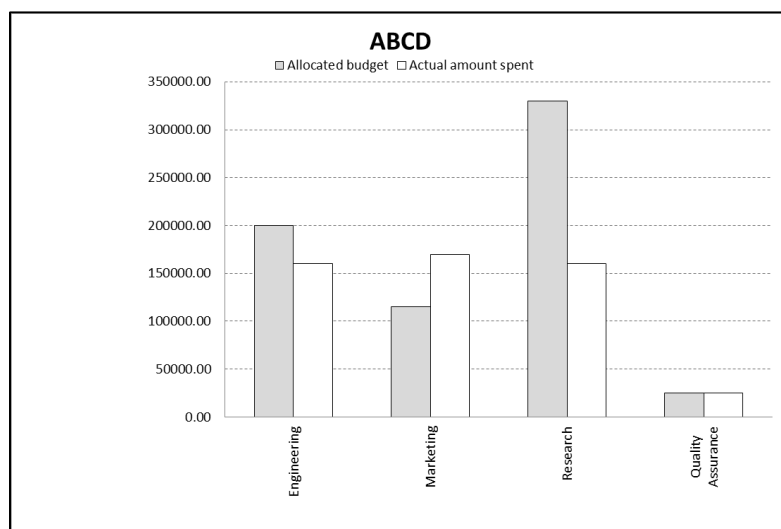
[10]

June 2018

- 6.1 Give TWO tips for setting high quality questions to be used in a survey. (2)
- 6.2 How would one transfer data collected electronically to another application without re-typing the data? (2)
- 6.3 Assume that you have one spreadsheet that uses data from another spreadsheet.

Give ONE reason why it would be better to insert a cell reference instead of using the copy and paste method to return the required data. (1)

- 6.4 Study the graph below and answer the questions that follow.



- 6.4.1 How many categories (series of data) are shown in this graph/chart? (1)
- 6.4.2 Explain the problem that exists in the Marketing department according to the graph/chart. (1)
- 6.4.3 Which department underspent by the largest percentage on their allocated budget? (1)
- 6.4.4 Suggest THREE improvements that could be made to this graph/chart to make it easier to interpret. (3)

[11]

March 2018

- 6.1 When does data become information? (1)
- 6.2 Explain why using an online questionnaire is an efficient option for gathering data, by referring to: (2)

- Data capture
- Data processing

6.3 The following rule was entered into a database to prevent inaccurate input: (2)

≤ 0 OR ≥ 18

Give TWO reasons why irrelevant or unusable data can still be entered.

6.4 Explain why you would NOT use information found on the Internet, even if it was written by an expert author. (2)

6.5 What word processing feature could be used to view the changes made by multiple authors to a single document? (1)

6.6 How can one prevent changes being made to a spreadsheet opened in a spreadsheet application? (1)

6.7 How can one prevent the input of duplicate records when capturing data in a database table? (1)

[10]

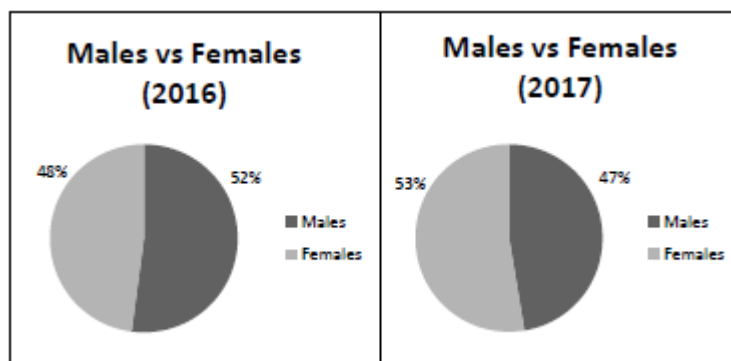
November 2017

6.1 Why would an author's name not be enough to consider a source trustworthy? (1)

6.2 An Internet search returned a link from an advertiser at the top of the set of results. (1)

Give a reason why it may not be a good idea to follow this link.

6.3 The graphs below represent the change in male and female learner numbers over a period of time.



6.3.1 What conclusion can be made based on the data above? (1)

6.3.2 What type of graph would you use to combine the information in the graphs above? (1)

- 6.4 How does the number of respondents affect the outcome of a survey? (1)
- 6.5 Give ONE reason why the values in the *Name* column and *Marks* column in the data below were not sorted correctly. (2)

Original data			→	Sorted data		
Surname	Name	Marks		Surname	Name	Marks
Tlou	Lerato	54		Harms	Frikkie	54
Hlongwana	Bulisa	89		Hlongwana	Bulisa	89
Rhadebe	Julius	28		Howell	Liam	28
Harms	Frikkie	17		Rhadebe	Julius	17
Howell	Liam	43		Tlou	Lerato	43

- 6.6 Identify THREE problems in the wizard below that will affect the quality of data when the import process is completed. (3)

Import Text Wizard

What delimiter separates your fields? Select the appropriate delimiter and see how your text is affected in the preview

Choose the delimiter that separates your fields:

Tab
 Semicolon
 Comma
 Space
 Other:

First Row Contains Field Names
Text Qualifier: {none} ▼

ID	NAME	SURNAME	GRADE	CLASS
9805022579182	Greg	Johnson	12	A
9803074103084	Anastasia	12	B	
9801199621089	Sipho	Lushaka	12	C
9804293101081;	Lerato;	Makhena;	12;	D

[10]

Information Management Activities Solutions

Activity 1

- 1.1 1. Choose your gender:
3. How many subjects do you have?
- 1.2 There are many different responses, that will first need to be grouped in order to be analysed/The question is not a closed question
- 1.3 It is a 'double question', a person could like only one of the two/Very limited/Subjective
- 1.4
 - Setting out the reason(s) for the survey
 - Thanking the respondent for their time/honesty/willingness
 - Giving general instructions on how to complete the survey
 - Giving instructions on what to do with the completed survey
2.
 - Analysis is easier
 - Easier to distribute
 - Results are captured automatically
3.
 - Accuracy
 - Currency
 - Validity
 - Relevance
 - Completeness
4.
 - The content is not always verified
 - The content can be changed by anyone
5.
 - Citation – reference information of a source used
 - Footnote – additional information placed at the bottom of the page regarding a specific fact/word/phrase within a document

Activity 2

- 1.1
 - Cross-reference with other sources
 - Look at the format and layout, e.g. spelling errors
 - Check credentials/affiliation of the author/organisation running the website
 - Check objectivity/bias with other sources
 - Check how many times source has been cited
- 1.2
 - Check date created
 - Check date updated
 - Cross-reference with other source

2.
 - It is a list of all the sources used in the document/Bibliography with sources

Why

- All sources should be acknowledged to avoid issues with copyright
 - For future reference
 - To compare if the original sources were not plagiarism
- 3.1
 - Follow-up questions can be asked
 - Interviewer can confirm immediately if information on the biographical data is accurate: age, gender, race
 - Interviewer is able to observe verbal and non-verbal communication, i.e. body language, emotions, behaviour, etc.
 - 3.2
 - Can be very time consuming
 - Transport to conduct interviews can be expensive
 - Interviewer can manipulate answers
 - Interviewer could have their own preconceived biases that they build in to the interview or the documented responses
 - Have to be a skilled interviewer to obtain quality data
 - 3.3
 - Improved accuracy/Data validation can be done/No issues with handwriting
 - Less time needed for data capture/Respondents may be more likely to complete/answer the survey
 - Data can be exported for analysis (e.g. into a spreadsheet) directly
 - Easier to 'distribute' survey/has a wider range of respondents, etc.
 - 3.4
 - Set limits for online engagements/intake capacity
 - Set time limits for searching
 - Identify the kind of information you seek
 - Constantly review and update

Activity 3

1. Spreadsheets can use functions, create graphs etc.

Databases can extract and present data in queries and reports.

2. Plagiarism
 - To steal and pass off (the ideas or words of another) as one's own
 - To use (another's ideas, words, products) without crediting the source
 - To present as new and original an idea or product derived from an existing

Piracy

- Illegally using/ copying or distributing software without ownership or legal rights

3. Copyright
4. Survey is a research method while questionnaire is the type of tool to collect data

5.
 - Author's name
 - Organisation / company name
 - Short extract or summary of the report
 - Date of the report
6.
 - Databases are better suited to working with (and viewing) large amounts of data
 - Database are better for performing (complex) queries
 - Databases are better for producing customised reports, containing groupings and summaries, etc.
 - Databases can use forms for input to view one record at a time
 - Databases offer better data validation techniques (e.g. validation rule, input mask, required property), etc.
7.
 - Cross-reference the information with other sources
 - Check that the publication date is recent
 - Check if the information comes from a credible source
 - Look critically at the spelling and grammar for credibility
 - Check to see that the document is not biased or opinion- based
 - Check the credentials of the author(s)
 - Check the links given to other sources

Activity 4

- 1.1
 - Easier to obtain, because many different ways to transfer digital information. (e.g. e-mail, 'cloud', SMS, portable storage)
 - Less work/time needed, because not necessary to retype/scan data sources into digital format
 - More likely to be up to date, because distribution of digital data is faster than hard copy
- 1.2
 - Data refers to raw unprocessed facts that are not useful on their own
 - Information is processed data that has meaning/has been processed
2.
 - It would save time as the data would be captured immediately
 - It would provide potentially more accurate data if the form is suitably validated
 - The form can be quickly adapted if there is additional data that needs to be captured
- 3.1 Closed question, since the question can be answered by a single answer
- 3.2 It would be (almost) impossible, or impractical, to provide a set of options to predict all possible options
4.
 - All empty cells or columns should be deleted
 - All columns should have file names
 - All data should have the correct data types

5.
 - Readability
 - Typography
 - Navigation
 - Colour/Images
 - Content (language, spelling)

Activity 5

1.
 - Limited number of responses
 - Responses can be selected from a list
- 2.1 4
- 2.2 It is not good database principles to have more than one type of entry in the same field
- 2.3
 - Export the data to a spreadsheet (or import the original text file data into a spreadsheet)
 - Use (text) functions in the spreadsheet to separate the names and the classes into two columns/Use the function text to columns
 - Import the data back into the database
3. This shorter version of the URL will take a user to the same web address, but is easier to remember and/or type
4. Track changes
5. Ensure that only one option from a list of options can be selected

Activity 6

- 1.1 Question 1: Radio buttons allow only one response, whereas two or more responses may be applicable
Question 2: Not clear what response is required
- 1.2 The respondent is asked to select a response from a set of options
2. Styles
3. URL shortening service converts a long URL to a shorter version
- 4.1 Information or news that is deliberately meant to deceive people
- 4.2
 - Cross-check the information with other sources
 - Check reliable sources
5.
 - Perform a spell check
 - Ensure grammar is correct
 - Ensure formatting is correct
 - Verify that layout is correct

Activity 7

- 1.1
 - Plagiarism is the act of passing off someone else's work as your own
 - Copyright refers to the legal right to make copies
- 1.2
 - Plagiarism: Reference all borrowed work
 - Copyright: Do not make copies of content without permission
2.
 - Indicates that the content of the website could have changed since the date it was used
 - Indicates what the information was on that specific date
3.
 - Charts/Graphs
 - Sorting
 - Pivot tables
 - Conditional formatting
 - Wide range of functions/formulas
 - Filtering
 - Validation facilities
 - Results of functions/formulas updates automatically
4. The way a source is referenced in a document
5.
 - For collecting individual perspectives/experiences/opinions
 - Easy/Quick way to gather information from individuals/groups
 - For targeting specific respondents, etc.
6.
 - The answer is not specific
 - The question does not limit the answer
 - Options are not sufficient
 - Data won't be valid
 - Answers could be incorrect

Information Management Past Exam Papers Solutions

November 2019

- 6.1.1 **Purpose of an abstract**
A brief **summary**/overview/outline of the report✓ 1
- 6.1.2 **Purpose of an introduction**
(1) To give a (description of the) purpose of the report
(2) To give background information about the topic
(3) To give a brief idea of what the researcher did/research process was to solve the problem
✓ (Any one)
(Note to marker: Do not accept 'target audience'.) 1
- 6.2 **TWO reasons for information not being suitable**
(1) The author is not an authority on the topic/Cannot obtain bibliographical information
(2) The information is too old
(3) Information in the document was found to be plagiarised
(4) The information is biased
(5) The information is contradictory
(6) Information cannot be cross-referenced
(7) The information is very limited and does not adequately cover the topic
✓✓ (Any two) 2
- 6.3.1 **ONE limitation of closed questions in a questionnaire**
(1) Limited options may lead to skewed data
(2) Options may be biased towards a point of view
(3) Respondent may want to give an answer not in the list/Limits possible responses that could be given by the respondent
(4) No indications of whether the respondent understood the questions
✓ (Any one) 1
- 6.3.2 **TWO benefits for a researcher when closed questions are answered electronically**
(1) Easier to process/analyse responses in a graph/spreadsheet/database
(2) The creation of graphs can be automated
(3) Can read all responses/Bad handwriting is not an issue/Do not have to retype the responses/Fewer errors in data
(4) Data capturing can be automated
(5) Easy to share data with others/publish dataset
(6) Data validation of responses can be done
(7) Possible response times are quicker
(8) Higher return rate is possible
✓✓ (Any two) 2

6.4 **THREE reasons why the graph is difficult to interpret**

- (1) The title obscures the content of the graph/The title may make it difficult to see detail/interpret the graph
- (2) The graph shows a big difference in the bars but values are very close
- (3) The combined percentages go well beyond 100%/It is not obvious that the graph displays parts of a whole/A pie chart would be more suitable
- (4) The Y-axis starts at 80% rather than 0%/Incorrect upper and lower limits of the Y-axis
- (5) The legend has a meaningless label
- (6) Axes are not labelled

✓✓✓ (Any three)

3

[10]

June 2019

6.1 **TWO non-internet sources of information**

- Printed media: Books/Newspapers/Printed media/Articles/Library
- Ask people: Interviews/Survey/Questionnaire
- Offline recordings: Video clips/Audio clips/Podcasts
- Broadcast media: Radio/Television

✓✓ (Any two)

2

6.2 **TWO reasons to use a drop-down form field and not a text form field**

- To offer the respondent a limited choice of answers
- To avoid typing/input errors
- Consistent data for processing/export
- Generally drop-down field input is faster than typing

✓✓ (Any two)

2

6.3 **TWO reasons why wiki content may not be reliable**

- Content can be contributed by non-expert
- Not necessarily moderated by experts
- Information may be biased/prejudiced/inaccurate
- Information may be outdated/Page may be old

✓✓ (Any two)

2

6.4.1 **THREE problems affecting quality of data imported to DB**

- Missing information
- Inconsistent data type/date format used in the columns
- Duplication of headings
- Meaningless field names
- Two sets of data in one field/Inconsistent order of data
- Difficult to set a primary key due to missing information/duplicate field names

✓✓✓ (Any three) 3

6.4.2 **ONE problem with the data for a meaningful graph**

- No suitable numeric data
- There are no trends or patterns in the data
- Data does not allow for functions/formulas
- Data cannot be summarised

✓ (Any one) 1 4

[10]

November 2018

6.1.1 **Open-ended question**

Question 3✓ /What impact does Mathematics have on the economy?

1

6.1.2 **Best suited question for a survey**

Question 1✓ /Did you pass Mathematics?

1 2

6.2 **TWO ways to check for plagiarism**

- Type a sentence/phrase in a search engine and search for it
- Use software designed to detect plagiarism
- Check for non-printing characters that may appear
- Follow hyperlinks in the learner's work
- Check for different writing styles in the document
- Interview the learner

✓✓ (Any two) 2

- 6.3 **TWO tips for checking information quality**
Authority
- Check the credentials of the author
 - Check reviews of the source/Author
- Accuracy**
- Compare with other sources for accuracy
 - Number of citations
- Currency**
- Check how recently the information was posted/Check the date
- Bias**
- Check for bias in terms of gender, race, religion, culture, etc.
- ✓✓ (Any two) 2
- 6.4 **TWO spreadsheet features for data analysis**
- Functions/Formulas/Calculations
 - Sorting/Grouping/Sub-totalling
 - Conditional formatting
 - Graphs/charts
 - Filtering
- ✓✓ (Any two)
- (Note to marker: Accept any reasonable example of a feature for data analysis, e.g. Pivot tables, What-If analysis, etc.)* 2
- 6.5 **Citation versus Bibliography**
- Citation – Credits/Names/References a single source where the information is used✓ in the report
 - Bibliography – Gives a full list of all sources indicating information about the publication of those sources✓
- 2
- [10]**

June 2018

- 6.1
- Question should give options/Closed question
 - Not too many/few options for closed questions
 - Question should be concise and unambiguous
 - Question must deal with the topic of the survey
 - Question should not require irrelevant personal information
 - You should not be able to get the answer from any other resource
- ✓✓(Any two) (2)
- 6.2 Export/Copy to csv/text file/another application✓
 Import/Paste into new application✓ (2)
- 6.3 Changes to original data will be updated automatically wherever it is referenced✓ (1)

6.4.1	2✓	(1)
6.4.2	They spent too much of their budget/They overspent✓	(1)
6.4.3	Research✓	(1)
6.4.4	<ul style="list-style-type: none"> • Add currency symbols to the numbers/amounts • Add data labels • Add axis titles • Move the legend to the left/right/bottom • Use a more meaningful chart title • Use gradient/textured/colours fill for the bars/columns • Remove the decimal portion of the numbers • Decrease the units of the y-axis 	
	✓✓✓(Any three)	(3) (6)
		[11]

March 2018

6.1	When data is processed/becomes meaningful✓	(1)
6.2	<ul style="list-style-type: none"> • Reach a larger audience • Distance is not an issue • Data capture can be automated 	(2)
	✓ (Any one)	
	AND	
	<ul style="list-style-type: none"> • Responses can be collated into a spreadsheet • Responses can be analysed automatically 	
	✓ (Any one)	
6.3	Negative ages/numbers will be accepted✓ Very high ages will be accepted/there is no limit to how high a number may be✓	(2)
6.4	<ul style="list-style-type: none"> • It may be old information • Information may be biased • Information may not be accurate/contrary to other expert authors • Search criteria may be irrelevant 	(2)
	✓✓ (Any two)	
6.5	Track changes✓	(1)
6.6	<ul style="list-style-type: none"> • Lock cells • Protect the sheet/add a password • Make the file read only 	(1)
	✓ (Any one)	

- 6.7 • Use a primary key (1)
 • Use indexing (No duplicates) property ✓ (Any one)

[10]

November 2017

- 6.1 • It may be an unverifiable author (1)
 • The author could have no expertise in that subject/field
 • The author could have plagiarised the information ✓ (Any one)

- 6.2 • It may give biased information (1)
 • It may not give all the information required ✓ (Any one)

(Note to marker: Accept answers related to a scam.)

- 6.3.1 Males decreased/Females increased ✓ (1)

- 6.3.2 Use a line/bar/column graph ✓ (1) (2)

- 6.4 • Too few respondents will result in inconclusive findings (1)
 • Sufficient number of respondents will result in reliable findings
 • Wider range of viewpoints ✓ (Any one)

- 6.5 The sorted range did not include the marks column ✓✓ (2)

- 6.6 First row should be set to field names ✓ (3)
 Missing field/surname in the third row/other data in wrong columns for row 2/3 ✓
 Wrong delimiter used/Data is not separated into columns in the last row ✓

[10]

Summary of Social Implications

Computer-related crimes

Cybercrime is defined as a crime in which a computer is the object of the crime (hacking, phishing, spamming) or is used as a tool to commit an offense (child pornography, hate crimes). Cybercriminals may use computer technology to access personal information, business trade secrets or use the internet for exploitative or malicious purposes.

Cybercrime encompasses a wide range of activities, but these can generally be broken into two categories:

- Crimes that target computer networks or devices. These types of crimes include viruses and denial-of-service (DoS) attacks.
- Crimes that use computer networks to advance other criminal activities. These types of crimes include cyberstalking, phishing and fraud or identity theft.

Source: <https://www.techopedia.com/definition/2387/cybercrime>



Scan for article

THEFT OF COMPUTER HARDWARE

Computer hardware is very expensive and it is important that you protect yourself against hardware theft. Here are some general guidelines on how to protect yourself:

- Never leave your laptop or mobile device unattended in a public place.
- Use passwords as a security method.
- Use a cable to lock your equipment to a table or desk in the office.

SOFTWARE THEFT



For additional information

Software theft is the unauthorized copying of software. Most retail programs are licensed for use at just one computer site or for use by only one user at any time. By buying the software, you become a *licensed user* rather than an owner (see EULA). You are allowed to make copies of the program for backup purposes, but it is against the law to give copies to friends and colleagues.

Source: https://www.webopedia.com/TERM/S/software_piracy.html

To avoid software theft, do the following:

- Do not copy, duplicate or distribute any software without a copyright licence.
- Do not download and use illegal software from the internet.
- Do not lend your software so that an illegal copy can be made.

BANDWIDTH THEFT

Bandwidth theft refers to the use of bandwidth without paying for it. Bandwidth theft can also occur when one is connected to an unprotected network.

Precautions include:



- Having good password policies.
- Being careful when installing free software from the internet, as it might be malware.

For additional info checkout this site: <https://altlab.com/hotlinking.html>

IDENTITY THEFT

Identity theft occurs when someone uses your personal information to pretend to be you to commit fraud or to gain financial benefits.

Your personal information could be your full name, email address, online login and passwords, driver's license number, passport number or bank account number. Criminals can gain access to these types of information and sell it on the dark web to commit identity theft.

Here are some common ways criminals commit identity theft.

Phishing, Skimming, Unsecure web connections, Phone scams, Data breaches, Email spoofing.

THEFT OF TIME AND SERVICES

Theft of time refers to a person receiving payment from his or her employer for work that the employee did NOT do.

Theft of services refers to the person using company equipment, such as a computer or the internet, for personal matters.

CROWDFUNDING

Crowdfunding is a method of raising capital through the collective effort of friends, family, customers, and individual investors. This approach taps into the collective efforts of a large pool of individuals-primarily online via social media and crowdfunding platforms-and leverages their networks for greater reach and exposure.

Source: <https://www.fundable.com/learn/resources/guides/crowdfunding/what-is-crowdfunding>



Scan for more

These are possible crowd funding options:

- Donation Crowd Funding
- Reward Crowd Funding
- Loan Based Crowd Funding
- Investment Crowd Funding

INTERNET ATTACKS



Scan for more

Internet attacks also known as cyberattacks, is a malicious and deliberate attempt by an individual or organization to breach the information system of another individual or organization. Usually, the attacker seeks some type of benefit from disrupting the victim's network.

Source: <https://www.cisco.com/c/en/us/products/security/common-cyberattacks.html>

MALWARE

Malware is a term used to describe malicious software, including spyware, ransomware, viruses, and worms. Malware breaches a network through a vulnerability, typically when a user clicks a dangerous link or email attachment that then installs risky software. Once inside the system, malware can do the following:

- Blocks access to key components of the network (ransomware)
- Installs malware or additional harmful software
- Covertly obtains information by transmitting data from the hard drive (spyware)
- Disrupts certain components and renders the system inoperable

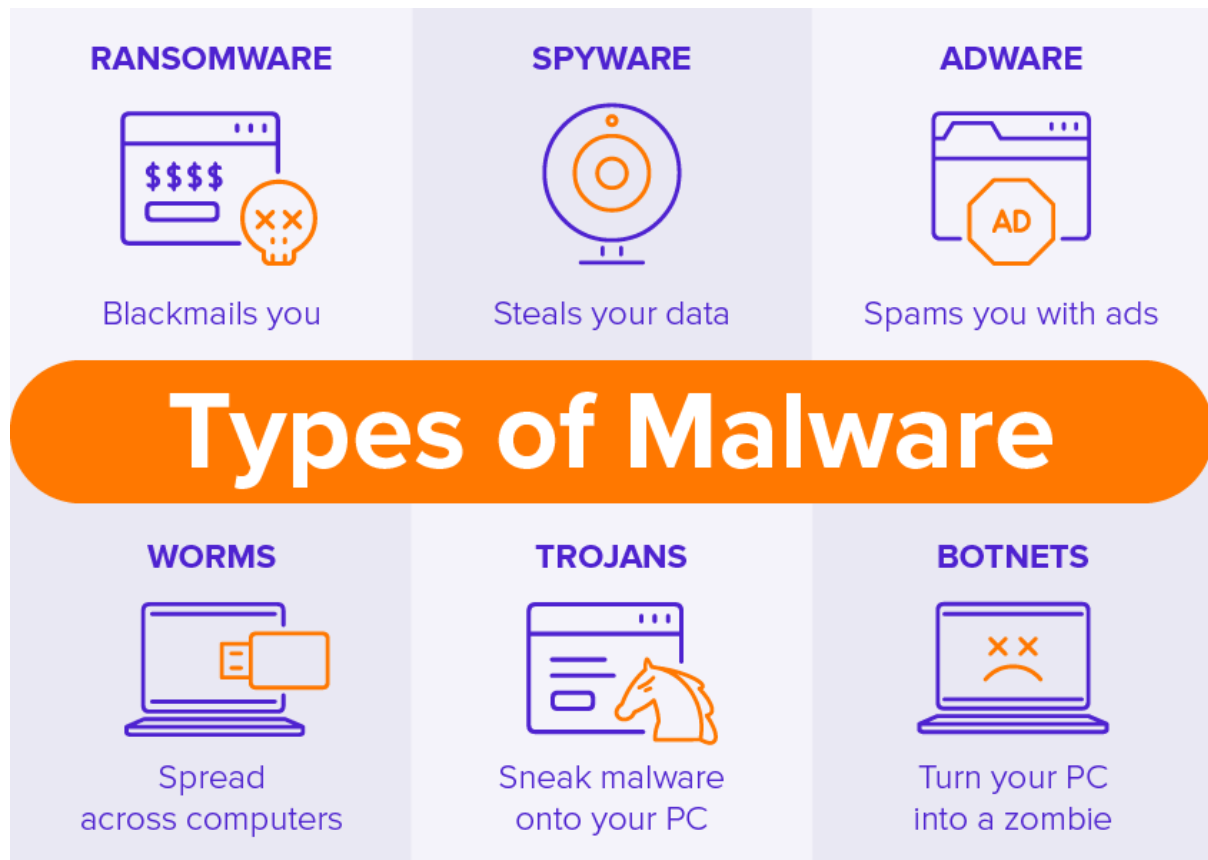


Image source : <https://www.avast.com/c-malware>

BOTS



Scan to watch clip

An Internet bot, in its most generic sense, is software that performs an automated task over the Internet. More specifically, a bot is an automated application used to perform simple and repetitive tasks that would be time-consuming, mundane or impossible for a human to perform.

Bots can be used for productive tasks, but they are also frequently used for malicious purposes.

Source: <https://www.techopedia.com/definition/24063/internet-bot>

ZOMBIES

In computing, a zombie is a computer connected to a network that has been compromised and taken over by a hacker, a virus or a Trojan. It can be used remotely for malicious tasks.

Source: <https://www.pandasecurity.com/en/security-info/zombie/>

RIGHT TO ACCESS VS RIGHT TO PRIVACY

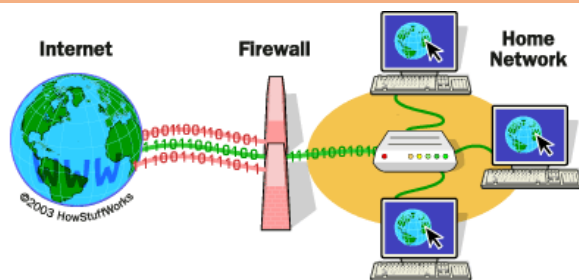
Here are a few examples to look at when it comes to the right of access versus the right to privacy:

If you do your work on a computer owned by someone else, they may have the right to claim access to your data files.

If you use online services such as Facebook you should be aware that their End User License Agreement states that whatever you post belongs to them.

If your school has an AUP for the computer lab that you have accepted, you may have allowed people other than yourself to access your data files.

FIREWALLS



A firewall is a system designed to prevent unauthorised access to or from a private network. You can implement a firewall in either hardware or software form, or a

combination of both. Firewalls prevent unauthorised internet users from accessing private networks connected to the internet, especially intranets. All messages entering or leaving the intranet (the local network to which you are connected) must pass through the firewall, which examines each message and blocks those that do not meet the specified security criteria.

Source: <https://kb.iu.edu/d/aoru>

Image Source: <https://computer.howstuffworks.com/firewall.htm>

Scan for more



Scan for more



ANTIVIRUS PROGRAMS

Antivirus software is a program or set of programs that are designed to prevent, search for, detect, and remove software viruses, and other malicious software like worms, trojans, adware, and more.

Source: <https://www.webroot.com/in/en/resources/tips-articles/what-is-anti-virus-software>

Below is a list of antivirus software available:

- **Bitdefender** Antivirus Plus 2019.
- Norton AntiVirus Plus.
- F-Secure Antivirus SAFE.
- Kaspersky Anti-Virus.
- Trend Micro Antivirus+ Security.
- Webroot SecureAnywhere AntiVirus.
- ESET NOD32 Antivirus.
- G-Data Antivirus.

SOCIAL IMPLICATIONS OF E-COMMUNICATIONS AND TECHNOLOGY

IMPACT OF SOCIAL NETWORKING SITES

POSITIVE EFFECTS OF SOCIAL MEDIA	NEGATIVE EFFECTS OF SOCIAL MEDIA
Social media has made it easy to make friends	Encouraging poor grammar and spelling
Social media helps in fostering empathy	Allowing the spread of misinformation that may be perceived as fact even in light of evidence to the contrary Fake news
Social media helps in speedy communication	Exposing children to online predators Providing information that increases the risk of identity theft
Social media makes the world seem small	Creating a culture in which a single mistake such as a racy picture or poorly thought-out comment can cause irreparable harm to someone's reputation
Social media helps in building relationships	Decreasing productivity as workers habitually check social networking sites when they should be working
Social media helps in finding common ground	Creating a platform for cyber bullying

Akram, Waseem. (2018). A Study on Positive and Negative Effects of Social Media on Society. International Journal of Computer Sciences and Engineering. 5. 10.26438/ijcse/v5i10.351354.

Sources: <https://www.technology.org/2019/06/06/social-networking-sites-and-the-positive-impact-they-have-on-the-society/>



https://www.researchgate.net/publication/323903323_A_Study_on_Positive_and_Negative_Effects_of_Social_Media_on_Society,

https://socialnetworking.lovetoknow.com/Negative_Impact_of_Social_Networking_Sites

The Impact of Technology on the Global Community

POSITIVE EFFECTS OF TECHNOLOGY	NEGATIVE EFFECTS OF TECHNOLOGY
Telecommuting (e-commuting)	Working environment
Improved healthcare	Environmental problems
Enhances our ability to fight crime	Social effects
Increased productivity	Crime and abuse
Making the impossible, possible	Lack of upskilling
Artificial Intelligence	
Machine learning	
Block chain	

Source: <https://www.siyavula.com/read/cat/grade-12-cat/social-implications-of-ecommunications-and-technologies/08-social-implications-of-ecommunications-and-technologies>

Scan to read more



VIRTUAL AND AUGMENTED REALITY

Augmented reality (AR) adds digital elements to a live view often by using the camera on a smartphone. Examples of augmented reality experiences include Snapchat lenses and the game Pokemon Go.



Virtual reality (VR) implies a complete immersion experience that shuts out the physical world. Using VR devices such as HTC Vive, Oculus Rift or Google Cardboard, users can be transported into a number of real-world and imagined environments such as the middle of a squawking penguin colony or even the back of a dragon.



Scan for more

Source: <https://www.fi.edu/difference-between-ar-vr-and-mr>

Social Implications: User-centred design

- Designed to work in the way that a user wants to work.
- Designed to be easy to use and have features in logical places.

Advantages of a UCD approach include:

- Users are less frustrated with the software.
- Users need less training as the layout is logical and user friendly.
- Users make fewer errors.
- Users who have never used the application learn how to use it very quickly.
- Users find websites easy to navigate.
- Data entry can be easy to use.
- Presentations are easier to present or understand.

Scan me for additional information



Social Implications Activities

Activity 1

Legacy media is a term associated with the use of old media (hardcopy, print newspapers, magazines, periodicals).

1. Why is legacy media becoming obsolete?
2. How has digital media impacted on newspapers and radio?
3. List three ways in which people cope with information overload.
4. Explain the difference between social bookmarking and social networking that form part of social media.
5. People receive e-mails that seem too good to be true; for example, that they have inherited money.
 - a) What information could a phishing email claiming "...you have inherited money..." be trying to acquire?
 - b) Give an example of any another technique that can be used to get users' personal information.

Activity 2

1. What is Twitter?
2. Why would an events company use Twitter rather than Facebook to announce upcoming events?
3. Give the term when somebody, opens an online account using another person's details.
4. Define the term social engineering.
5. Why would anybody use social engineering?
6. How is it possible that an email can still be sent and/or received during a power failure?
7. Explain how an educator at school can send an email to parents of his/her register class, without parents knowing to whom the same email was sent.
8. Explain what a mailing or distribution list is in the context of email communication.
9. State two advantages of using a mailing or distribution list in email communication.

Activity 3

1. Your anti-virus program reports that it has quarantined a virus. What does this mean?
2. Provide THREE measures you can take to avoid computer viruses, besides installing anti-virus software and keeping the software up to date.
3. Give TWO examples of firewall software.
4. Your father says that he makes a point of updating his anti-virus software twice a year. Explain to him why this approach is not sufficient.
5. A pop-up appeared on your aunt's computer saying that she should download an anti-virus program from the internet, as viruses had been detected on the computer.

Why should she not respond to this warning, if viruses are so dangerous?

6. Give the name of one popular anti-virus software package.

Activity 4

You have legally purchased a copy of a new game and your friend Thulani asks you to make a copy for him to use and adds that he will pay for it.

- 1) Explain to Thulani why you cannot do this.

Game publishers allow users to download games directly onto their own device.

- 2) Give advantages of allowing customers to download the game.
- 3) Explain two environmental benefits of downloading games rather than buying them on disk.
- 4) Tabulate the positive and negative impact the use of digital devices have on people's health and wellbeing.

Activity 5

Phishing is the most common form of computer crime and people easily fall victim to this kind of crime.

1. Why would people easily fall victim to phishing?
2. How does phishing happen?
3. Give a list of practical tips to ensure that your browsing experience is a safe experience.
4. What is the function of Firewall software?

5. How does this Firewall software work?
6. List three devices that cater for a user with poor muscular control.
7. Give two economic reasons why ICTs are used in trade and industry as well as business, exclude reasons related to the employment cost of people.

Activity 6

Information and Communications Technology (ICT), is becoming more of a part of our daily lives' governments are making increasing use of it to get services closer to the people.

1. Give one advancement, one development, and one improvement in which the development of ICT has influenced the way the government operates.

You must give the advancement, development, and improvement that has taken place first and then give the effect that it has had on the government.

2. The widespread deployment of ICT's has led to the government's invasion of its citizens' privacy. Which two laws you would implement to protect the privacy of the people.
3. Describe two ways in which ICT has benefitted the way businesses operate.

Social Implications Past Exam Papers

June 2019

- 7.1 Employers should implement a policy to buy only ergonomically designed computers to prevent RSI/CTS among their workers.
- 7.1.1 Describe ONE ergonomically designed device that would prevent CTS (carpal tunnel syndrome). (1)
- 7.1.2 Discuss TWO reasons why implementing such a policy would be a good course of action for an employer. (2)
- 7.2 State TWO security measures to prevent computer theft at a school, other than fitting burglar bars and safety gates to the computer centre. (2)
- 7.3 The public has access to software that is published under various terms and conditions.
- 7.3.1 What laws protect the rights of people who create original content? (1)
- 7.3.2 What is an *EULA*? (Do NOT simply write out the acronym.) (1)
- 7.3.3 Give TWO reasons why people should NOT use pirated software. (2)
- 7.4 Why is it potentially risky to use Bitcoin to buy and sell items? (1)
- [10]**

November 2018

- 7.1 A user sometimes shares his/her personal details when using social media, e.g. a cellphone number or an e-mail address.
- Why should a user think carefully before sharing this information on social media websites? (1)
- 7.2 State TWO ways in which a system administrator can protect a network from hackers. (2)
- 7.3 Why would a research company benefit from using 'big data'? (2)

- 7.4 Explain why you want your friend to use a private browsing mode, such as incognito mode, when he uses your computer to log onto his web-based e-mail service. (2)
- 7.5 A school wants to promote e-learning by using the BYOD concept on a Wi-Fi network.
- 7.5.1 Explain the *BYOD concept*. (Do NOT only write out the acronym.) (1)
- 7.5.2 State TWO problems that this school could experience when implementing a BYOD policy. (2)

[10]

March 2018

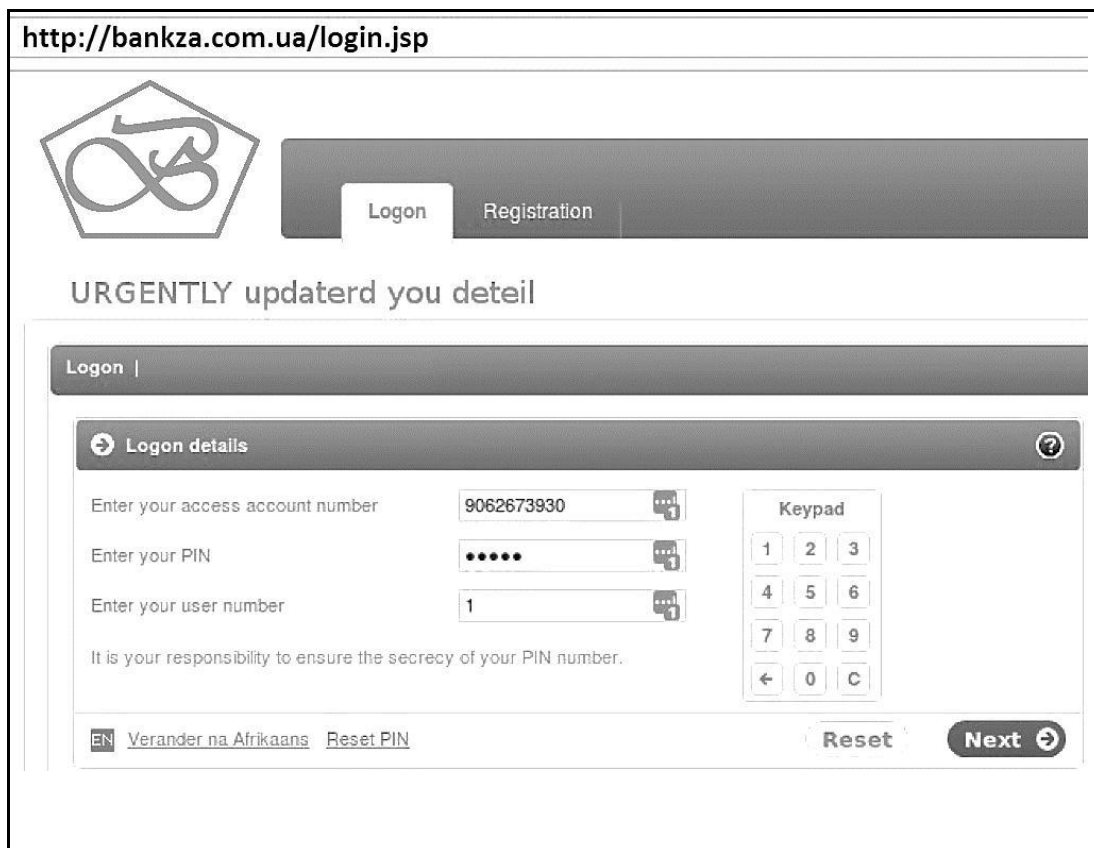
- 7.1 Give ONE indication that a message you have received is a hoax. (1)
- 7.2 State TWO ways in which ICTs may negatively impact the workplace. (2)
- 7.3 Why are governments concerned about the widespread use of Bitcoin? (2)
- 7.4 Telecommuting saves time and travelling costs.
Why do many employers still not allow telecommuting? (2)
- 7.5 Smart home appliances can connect to the Internet.
State ONE advantage of having Internet-connected (IoT) appliances, such as a washing machine. (1)
- 7.6 Besides cheating, discuss TWO reasons why some schools ban the use of smartphones. (2)

[10]

November 2017

- 7.1 Name the computer crime that has to do with posting false information/accusations about another person online. (1)
- 7.2 Suggest TWO rules for an acceptable use policy (AUP) in a school computer

- centre that has Internet access. (2)
- 7.3 While installing software, you were not required to enter a product key.
Give TWO reasons why this occurred. (2)
- 7.4 A company stores the personal information of its clients.
Suggest TWO guidelines for the company to ethically manage client data. (2)
- 7.5 Study the picture below and answer the questions that follow.
NOTE: Assume that BANKZA is the name of a legitimate South African bank.



- 7.5.1 Identify the type of scam represented in the picture above. (1)
- 7.5.2 State TWO ways in which a user can identify this as a scam. (2)

[10]

March 2017

- 7.1 Why would keylogger software not have any harmful effects if it is installed on a computer that is never networked or connected to the Internet? (1)
- 7.2 Green computing is every user's concern.
- 7.2.1 What is meant by the term *green computing*? (1)
- 7.2.2 Give TWO reasons why unwanted or disused ICT devices should NOT be thrown into a rubbish bin. (2)
- 7.3 State TWO potential ways in which telecommuting can be of benefit to an employer (a business owner). (2)
- 7.4 Explain what *phishing* is AND why updating your antivirus program will not prevent you from becoming a victim of phishing. (2)
- 7.5 State TWO ethical considerations to keep in mind when connecting to someone else's Internet connection. (2)
- [10]

November 2016

- 7.1 Briefly explain *how* a website or service like Kickstarter.com works to financially benefit entrepreneurs or start-up companies. (2)
- 7.2 The geotagging function of modern cameras is useful for holidaymakers and tourists.
- Explain what this statement means by explaining what *geotagging* is. (2)
- 7.3 State TWO general printing options that are provided in most programs, which can be used to promote green computing. (2)
- 7.4 Computers can be controlled remotely by criminals.
- 7.4.1 What is the general name for a group of computers that have been taken over and are being controlled remotely by criminals? (1)
- 7.4.2 Give ONE example of a criminal or malicious task these groups of computers may perform. (1)
- 7.5 Give TWO potential *disadvantages* of e-learning when compared to the traditional classroom approach, besides any cost factors. (2)
- [10]

Social Implications Activities Solutions

Activity 1

- 1) The writer had to do excessive research by going out and finding information whereas with digital media research is available through websites/blogs/twitter and there is more interaction with the readers.

Legacy media is being replaced by digital platforms whereby social media managers can give feedback on the connections between the people and the data.

- 2) Newspapers can now shoot video and make it part of the story and a radio station can write blogs and use Facebook as part of their show to interact with their audience.

Social media does better as it has an in-depth understanding of the audience as individuals, not only demographics, and therefore produces more in-depth content based on its target audience.

- 3)
 - Take a disciplined and structured approach to dealing with information by creating a routine that limits the time you spend interacting with information.
 - Filter emails into categories.
 - Use RSS feeds to structure news you read to limit browsing the web.
 - Make use of advanced searches and good search terms to help you find information when looking on the web.
- 4) Social bookmarking refers to the sites the user browses often and lets other users see what they bookmark – Save/collect/pin/store and many of these bookmarks let you see how many times a particular site has been bookmarked. There is no interaction between the users.

Social networking refers to sites like Facebook, Myspace, Twitter and Instagram that are dedicated websites and applications where users interact with other users and find people with similar interests to their own.

- 5)
 - a) To share personal information
 - Name
 - Surname
 - Address
 - Bank account details
 - Pin numbers
 - Login information
 - Contact numbers.
 - b) Whaling, Spear phishing, Spoofing, Pharming

Activity 2

- 1) Twitter is a free social networking (microblogging) service that gives users live feeds of added information. Only registered members can broadcast short posts or tweets (isolated group).
- 2) The default settings for Twitter are public and anyone can follow anyone on Twitter, unlike Facebook, where members need to approve social connections to follow someone.

Twitter allows for quick short messages with added hyperlinks that are received by a follower who is then informed about an event that will be hosted by the events company only, unlike Facebook that makes the world more open and connected.

People use Facebook to stay connected with friends and family, discover what's going on in the world and share and express what matters to them.

(Keep in mind you need to make a comparison as to how Facebook differs from Twitter.)

- 3) Identify theft, cloning
- 4) The use of deception to manipulate or trick someone into sharing confidential information.
- 5) Reasons: to impersonate someone, to install malware, for fraudulent purposes
- 6) The email service provider receives and keeps all the emails that are sent. Once the recipient accesses his/her email account when the power is back on, their messages will download (be sent) to the inbox of their email program.

Power might be off at the sender's end but not at the receiver's end or the ISP.

Backup power/UPS/inverters might be used to sustain the connection. Fibre/ADSL infrastructure remains working as a requirement in their licence

Emails sent via cell phone still seem to work but come through a lot slower

- 7) The educator will use the BCC field to include all parents' email addresses without them being able to see the names of the other recipients.
- 8) A group/set/collection of email addresses given a single group name.
- 9)
 - It saves time because all the email addresses do not have to be typed in one by one.
 - Any email sent to the group will be sent to every person in the mailing list.
 - Prevents errors in typing an address and omission of an address.
 - Any list member can send an email to all other list members, reply to all list members or send an email to the original sender only.

Activity 3

1. When an antivirus places an infected file in quarantine, it deletes the file from its original location and makes changes to it so that it cannot run as a program. It then transfers it to a hidden folder that other programs (or yourself as the user) cannot access where it stays until you choose to deal with it.
2. Any of the following:
 - Perform daily scans
 - Disable autorun
 - Disable image previews in Outlook
 - Don't click on email links or attachments
 - Use a hardware-based firewall
3. Accept all reasonable answers referencing most popular antivirus software brand names, and Windows firewall.
4. Your security software should be set to check for updates at least once a day; this will already be the default setting for most current security programs, although it's worth investigating your program's settings to make sure this is the case.
5. Computer viruses spread through downloads from the internet. So, if you have not bought an antivirus program, you should not download it from the internet.
6. Accept all reasonable answers referencing most popular antivirus software packages

Activity 4

1. It is illegal to make a copy of proprietary software, It is illegal to copy software and make money
2.
 - Collection of marketing data.
 - An electronic download can be installed and deleted from your computer so it could be harder to copy to a disk).
 - They can track where an illegal copy of a game might have come from.
 - There will be a wider audience for the product OR more ways to buy the game.
 - Saves money on CDs OR cheaper to produce OR cheaper distribution costs.
 - Helps environmental targets OR eco credentials of the company.
3.
 - The company's carbon footprint will be reduced as less power is used.
 - Fewer non-renewable resources are used to create the disk and packaging.
 - Lower emissions from transport and distribution of products.
 - Less waste produced, meaning less landfill.
 - Recycling costs are lower.
- 4.

Negative impact

- People spending time on technology rather than with family OR friends.
- Poor impact upon health due to inactivity.

Positive impact

- Use of technology is essential in modern world (need to develop skills to be successful).

- Time spent using technology rather than doing OR completing work OR school work.
- More likely to have accidents such as a car crash due to using technology in inappropriate situations.
- Dangers of giving out personal details leads to personal issues such as bullying.
- People becoming ill OR over-stressed due to the inability to stop working due to always available communication.
- Can risk not developing proper social skills.
- Lack of sleep due to over use of technology which affects work OR school performance.
- Can lead to inability to focus OR pay attention.
- Lack of sleep OR food leads to illness.
- Addiction is similar to other addictions and needs to be treated.
- Technology develops hand-eye co-ordination which is essential in modern world.
- Technology use makes life easier.
- Technology use linked to improved reading skills.
- Friendships can be built online (social networking) **OR** easier to maintain contact with friends and family (e.g. Skype).
- Access to information about health and wellbeing online.
- Exercises at home using digital devices such as the Wii.
- Health and fitness monitoring.
- Use of technology to stay safe OR track location.

Activity 5

1. Because the people receive emails or some form of communication that is supposedly from a legitimate website and will be requested to make updates, confirm personal information and log in to the website.
2. When the receiver of the mail actually does enter in their personal confidential details the sender will then be able to steal a persons' identity and in this way access accounts and steal money or purchase something fraudulently.
3.
 - Do not give out personal details.
 - Stay informed.
 - Don't be gullible: if in doubt check it out.
 - Do not click on links or pop-ups.
 - Install only trusted software.
 - Keep anti-virus software up to date.
 - Scan attachments and downloaded programs before you open or run them.
 - Do not meet in person with someone you have met online.
 - Discontinue uncomfortable conversations.
 - Think twice before posting on the internet, and do not post embarrassing material.
 - Use the privacy and secure settings provided by social networking sites.
 - It is OK to decline friend requests from strangers.
 - Be suspicious of people who appear to be too perfect.
 - To keep your location secret, you can turn off the geotagging function on your mobile device.
4. Firewall software is software that monitors and controls incoming and outgoing network traffic based on specific rules.

5. It protects your computer or network from unauthorised access from outside your network by flagging incoming packets based on the specified rules and not allowing them through.
6.
 - Eye tracking device
 - Head movement device
 - Large keyboards
 - Large trackballs
 - Joysticks
 - Foot pedal
 - Sip and puff
7.
 - They are often more reliable than people (e.g. don't get sick, tired, bored).
 - They are faster than people (can do more tasks in the same amount of time).
 - They can work constantly (24/7)/don't need breaks.
 - They reduce the need for other resources (promote green computing)

Activity 6

1.
 - Advancements in database technology have enabled the government to collate and monitor statistical information more quickly and accurately.
 - Improved cellular communications technology has enabled the government to communicate with its citizens more effectively.
 - Improved banking and financial security technology have allowed the government to fairly control and maintain the country's finances.
 - National networks development can allow voting to take place more efficiently and accurately. Voting management can be improved.
 - Social media network development has made the government operate in a more open and transparent manner.
 - Development of national network grids has allowed the government to control the electricity supply more equitably.
 - Development of radar information technology has enabled the defence capabilities to be improved.
 - Development of encryption methods has allowed the government to send its sensitive data via public networks.
2.
 - All information obtained must be fairly and lawfully processed through the Courts of Law.
 - The information obtained can only be used for a specific purpose.
 - The information obtained should only be enough for the purpose it was needed.
 - The information obtained must be accurate.
 - The information obtained should not be kept longer than necessary.
 - The information should be obtained and processed in accordance with the subject's rights as set out in the Constitution of the country.
 - The information obtained should be kept secure and protected from unlawful use.
 - The information obtained should not be given to anyone or any other department without a legitimate reason or without adequate protection.

3.
 - Computer-Aided Design.
 - Recruitment of employees
 - Improvements in database technologies, spreadsheets, and word processing software – to store company records.
 - Automation of manufacturing processes.
 - Online advertising (Social media presence)
 - Faster access to customers via an Internet presence OR e-mail OR Instant Messaging.
 - Lower administration costs (electronic office).
 - Video conferencing for international businesses.
 - Security and encryption improvements have benefitted financial transactions.
 - Customers can be targeted based on their interests.
 - Virtual Private Networks (VPN) for the company staff to work anywhere.

Social Implications Past Exam Papers Solutions

June 2019

7.1.1 **ONE ergonomically designed device that prevents CTS**

- Mouse pad with a wrist rest
- Keyboard with a wrist rest
- Split keyboard
- Track ball mouse/Vertical mouse

✓ (Any one) 1

7.1.2 **TWO reasons for employers to implement ergonomic policy**

- Time: Production *time* will not be lost because of employee sick leave/work related injuries
- Productivity: Workforce will be more *productive* due to the use of ergonomically designed equipment
- Profitability: Possibility of the company being more *profitable* resulting from higher productivity

✓ ✓ (Any two) 2 3

7.2 **TWO measures to prevent PC theft (NOT gates/burglar bars)**

- Alarm system/Armed response
- Lock down system units/Cable locks
- Video camera surveillance
- Controlled access, e.g. security guard, electronic device, supervisor, etc.
- Store computers in the strong room during non-school time

✓ ✓ (Any two) 2

7.3.1 **Laws that protect the creators of original content**

- Copyright laws ✓/Intellectual property rights laws

1

7.3.2 **EULA (End-user license agreement)**

- Licence agreement that specifies the terms of use of software, e.g.
 - Stipulates the number of computers on which the software may be loaded
 - Number of copies of the software that can be made for backup purposes
 - The rights to give or sell the software to another individual, but only if the software is removed from the user's computer first
 - Stipulates the limitation of the use and the amendment of the code, etc.

✓ (Any one) 1

7.3.3 **TWO reasons for NOT using pirated software**

- Creators of software do not receive their royalties/payment/Software authors will lose revenue
- It is illegal/You could be charged/fined/imprisoned
- Virus issues/Possible malware could lead to cybercrimes
- No product support from the publisher
- Job losses
- Unethical/Immoral

✓✓ (Any two) 2 4

7.4 **ONE reason for Bitcoin transactions being potentially risky**

- No consumer protection
- Cannot reverse a transaction
- Easier to hack Bitcoin wallets, etc.

✓ (Any one) 1

[10]

7.1 **ONE risk of providing personal data on social media sites**

Expose yourself to:

- social engineering attacks
- spam
- harassment/stalking
- cyberbullying
- identity theft

✓ (Any one) 1

7.2 **TWO ways to protect a network from hackers**

- Implement security policies/passwords/logins/access rights
- Set up a firewall
- Do not allow users to install software
- Make outside users access the network via a VPN
- Disable WPS
- Update firmware/Use alternate firmware
- DNS/Mac filtering
- Install/Update security/antivirus
- Prevent users from uploading files to the network
- Disable form autofill/Disable Remember me
- Disable USB ports/CD drives

✓✓ (Any two) 2

7.3 **Benefits of using 'big data' for a research company**

'Big data' leads to better decision-making which could reduce costs

The volume of data gathered provides more insight/

Companies have more data to analyse and base their findings/advice on

Because data is gathered all the time, 'big data' is more relevant

✓✓ (Any two) 2

7.4 **Reason for private browsing mode**

You do not want to store your friend's:

- browsing history
- web cache
- cookies
- passwords
- temp files

Ensure your friends privacy, etc.

✓ ✓ (Any two) 2

7.5.1 **Concept of BYOD**

Learners are allowed to use their own devices i.e. tablets, smartphones and notebooks to:

- connect to a (school's) network
- do school related work

✓ (Any one) 1

7.5.2 **TWO problems associated with using BYOD at school**

Device theft is difficult to control

Difficult to control data usage

Learners will be easily distracted

Potential spread of malware

Not all learners may have their own device

Security cannot be enforced on all devices (due to different operating systems and software/hardware versions)

Compatibility issues due to different hardware/software configurations/Software incompatibility

May cause a bottleneck on the network

Potential for learners to access sensitive data on the network

✓ ✓ (Any two) 2

[10]

- 7.1
- It requests to be forwarded to many other people
 - You receive the same message from many people
 - It could include a threat
 - Difficult to verify
 - Highly emotional content
- ✓ (Any one) (1)
- 7.2
- Could lead to job losses
 - Distracts employees (lowers productivity)
 - Increase in electricity consumption
 - Networks can be hacked into
 - Employees use work place resources for their own benefit /
 - Employees may increase company risk by downloading viruses and torrents
 - May lead to lack of trust between employer and employee
- ✓✓ (Any two) (2)
- 7.3
- Government has no control over transactions
 - No tax can be generated from transactions
 - No consumer protection rights if unhappy with purchase
 - It is often used as payment in illegal activities
 - Rapid fluctuation in value may put citizens at risk
- ✓✓ (Any two) (2)
- 7.4
- Employer cannot track working hours/may not trust employee to work the hours he should
 - Employer expense to set up ICT systems to accommodate telecommuting
 - Work is dependent on a stable Internet connection/electricity supply
- ✓✓ (Any two)
- (Note to marker: Accept any other valid reason.)* (2)

- 7.5
- Appliances can be started remotely before getting home
 - Check on the status of appliance
 - Manufacturer can diagnose problems without visiting
 - Firmware can be upgraded
 - Usage can be monitored
 - Data can be retrieved from these devices
- ✓ (Any one) (1)
- 7.6
- Distraction to learning
 - Sharing of sensitive pictures
 - Theft creates unnecessary disciplinary issues for the school
 - Learners may develop anti-social behaviour
- ✓✓ (Any two) (2)
- [10]**

November 2017

- 7.1
- Cyberbullying
 - Flaming
- ✓ (Any one)
- (Note to marker: Accept bullying.)* (1)
- 7.2
- Do not give out login information/Do not use other peoples credentials
 - Do not visit untrustworthy/offensive websites
 - Do not stream or download during peak use
 - Do not use for non-school related activities
 - Limit the duration of using ICT resources
 - Guidelines on the use of external storage media
 - Guidelines on printer usage
- ✓✓ (Any two)
- (Note to marker: Accept answers that may be practical in a school situation.)* (2)

7.3	<ul style="list-style-type: none"> • Software does not require a licence key/ freeware/shareware/OSS • Upgrade of existing software • Pre-activated enterprise software • The software is illegal/cracked 	✓✓ (Any two) (2)
7.4	<ul style="list-style-type: none"> • Ensure privacy of data/They should not sell/share user data to third parties • Ensure safety of data against hackers/Encrypt data • Ensure compliance with the POPI act (Protection of Personal Information) 	✓✓ (Any two) (2)
7.5.1	<p>Phishing✓</p> <p>(Note to marker: Accept an explanation of phishing)</p>	(1)
7.5.2	<ul style="list-style-type: none"> • Not HTTPS/Connection is not secure/Lock icon missing • Not a South African domain • Spelling/Grammar mistakes 	✓✓ (Any two) (2)
		[10]

March 2017

7.1	<p>The confidential information that was collected cannot be sent back to the creator of the malware.✓</p> <p><i>(Note to marker: Accept answers referring to keylogger hardware being harmful.)</i></p>	1
7.2.1	<p>Using computers in a way that is not harmful to the environment ✓</p>	1

- 7.2.2
- It contains poisonous materials
 - It requires more and more land to be allocated to rubbish heaps
 - It can cause health issues for humans and animals
 - It can pollute water and soil, etc.
- ✓✓(Any two) 2
- 7.3
- Do not need large premises
 - Employees can work flexi-time (24/7) if need be
 - Less need for expensive equipment/features to improve working conditions (like coffee machine)
 - Reduced carbon footprint for the company, etc.
- ✓✓(Any two) 2
- 7.4
- Phishing is any attempt to trick a user into giving out sensitive information. ✓
- Humans make the attempt by sending out e-mails etc./There is no set program/code for the anti-virus program to recognise ✓
- 2
- 7.5
- Do not use a lot of data/Do not download too much/Ask how much data you may use
 - Do not visit sites which could potentially endanger the security of the computer
 - Not visiting sites with inappropriate content sites
 - Not downloading inappropriate content
 - Ask each time before you use the connection, etc.
- ✓✓(Any two) 2

[10]

November 2016

- 7.1 They provide money for start-up projects getting multiple small donations ✓ from the public ✓ (usually via the Internet)
(Note to marker: Give only one mark for crowdfunding.) 2
- 7.2 Geotagging refers to including the position/GPS coordinates ✓ of where the photo was taken in the metadata/with the file. ✓ 2
- 7.3
- Print multiple pages per sheet
 - Print only specific pages
 - Print preview to catch errors before final print
 - Print in grayscale
 - Print to file
 - Print 'back-to-back'/both sides of pages
 - Print in draft/'econo'-mode
- ✓✓ (Any two)
- (Note to marker: Accept printer specific modes that imply 'draft' or ink-saving.) 2
- 7.4.1 Botnet(Bots)/Zombie army(Zombies) ✓ 1
- 7.4.2
- Phishing
 - Spamming
 - Pharming
 - Spreading malware, e.g. Virus, Spyware, Ransomware, etc.
 - DDoS (Distributed denial of service) attacks
 - Illegal BitCoin mining, etc.
- ✓ (Any one) 1

- 7.5
- Lack of access to technology/working hardware/Digital Divide
 - Lack of technology skills to unlock/maximise potential of e-learning
 - Potential lack of guidance/input/feedback/monitoring from teacher
 - Dependent on electricity/battery life
 - Feelings of being isolated/Lack of human contact/Contributes to lack of socialisation skills
 - Health-related concerns ('Long hours of sitting'), etc.

✓✓ (Any two)

(Note to marker: Do not accept any answers relating to costs.)

2

[10]

Summary of Solutions Development - Theory

Word Processing

Overview:

Microsoft WORD is a word processing program. The program is used to create a range of documents like letters, articles, activities, homework, assignments etc.

File management:

Save

The **SAVE** command lets you save your new document in the directory and the folder of your choice and allows you to specify the name of your document. You can access the **FILE** tab on your Ribbon and choose **SAVE**, or you can use the keyboard shortcut **<Ctrl> + <S>**.

IMPORTANT:

Always keep good **file organisation** practice in mind when you name and save your documents. A good thought-out name can help you **find** the document more easily. The **file extension** will be determined by **the type of program** you **used** to create the document and the **operating system** will add it to the back of your file name e.g. math_assignment.docx

Save As

- You can access the **SAVE AS** option on the **FILE** tab on your ribbon.
- To save a **copy of** an existing file under a **new name** or **different location**.
- To save an existing file in a **new format** e.g. .txt/ .pdf/ .csv etc. To do this you need to choose **File Type** in the SAVE AS window and choose the required option.

Printing

To **PRINT** a document from your MS Office program, you can choose the **FILE** tab on the ribbon or use the keyboard shortcut **<Ctrl> + <P>**.

There are many **options** you can choose from **before** you print:

- **Range of pages:** Choose the exact pages of the document that you wish to get printed (5-7). If pages do not follow numerically, use a comma as separator (5, 7, 9).
- **Odd or Even pages:** Choose to print pages with odd numbers or pages with even numbers
- **Number of copies:** Choose how many copies of the document you need to get printed.
- **Print quality:** Access the Printer Properties and choose the QUALITY tab. Select the quality options that you need e.g. Black, Grayscale, Colour, ink saving etc.
- **Pages per sheet:** Select the amount of pages you wish to print on one side of each sheet.

Integration: Send to email or fax:

To send a copy of the document to an **e-mail address** or a **fax number**, you can choose **FILE, Export** and choose the desired option. A copy of the document will then be sent to an e-mail address specified or a fax number specified.

Properties

- Document **properties**, also known as **metadata**, are details about a file that describes or identifies it. Properties include title, author name, subject, and keywords that identify the document.
- To access and change these **properties** you need to choose the **FILE** tab on your ribbon. The **INFO** menu item contains all of the properties of your document. You can view and change the properties of your document here.

Select data using keyboard and/or mouse:

- To select data inside a document, you can use your mouse. Hold the **left mouse button** and drag the selection.
- To select all the data in a document you can use the keyboard shortcut **<Ctrl> + <A>**.

Basic punctuation:

- We use one space after all punctuation, including periods.
- The **Show/Hide** button on the **HOME** tab will reveal punctuation marks.

Formatting:

- **Font** type, style, size, colour, highlight, effects
Use these formatting techniques to create a **neat and readable** document. Be careful of using colours and font types that will make the document difficult to read.
- **Paragraph:**
 - **Spacing** lets you widen or lessen the spaces before and after paragraphs with **paragraph spacing**. You can change the spacing **between lines** of text by using the **line spacing** options in the paragraph box or the icon on the Home tab.
 - **Alignment** options help you to move text horizontally and vertically on a page.
 - **Horizontal alignment** (Home tab) – Left, Center, Right and Justified. Justified will align the text from the beginning of the left margin right up to the right margin in a block form.
 - **Vertical alignment** (Layout tab) – Top, Center, Bottom.
 - **Bullets and numbering** lets you organise lists with bullets or numbers. You can customise these bullets and numbers and even create **multi-level lists** using outline numbering.
 - **Line breaks (pagination issues such as widow/orphan control)**
 - Line breaks **specifies** how lines, paragraphs and pages **break** in your document.
 - The **Keep lines together** command will keep all the **lines selected**, together on one page. The **Window/Orphan** control will ensure that no lines of any paragraph will bleed over to the next page, but will rather move the whole paragraph so the lines stay together.

Editing:

- **Cut** <Ctrl> + <X> removes selection and keeps a copy on the clipboard if you need to paste it elsewhere.
- **Copy** <Ctrl> + <C> creates a copy of selection and keeps it on the clipboard for you to paste it elsewhere.
- **Paste** <Ctrl> + <V> places whatever is on the clipboard into the selected place in your document.
- **Find** <Ctrl> + <F> helps you **find text** elements inside a document.
- Replace helps you replace found text with different text elements inside a document.

Reviewing (Review Tab):

- **Proofing, spelling** and grammar, lets you check for spelling and grammar errors.
- **Autocorrect** can be set in the FILE OPTIONS menu and lets you choose certain autocorrect options.
- **Comments** allow the editor to leave important notes for other editors inside the document. This feature helps aid collaboration projects.
- **Protecting** your document can include setting a password for editing and/or reading. Use the **FILE, Info** settings to change the document settings.

Page layout (Layout tab):

- **Margins** – set the top, bottom, left and right margins for your document.
- **Orientation** – Choose between portrait and landscape options.
- **Size** – Choose whether you need to work on an A4, A5 or different size of paper.
- **Columns** – Selected text can be formatted into two or more columns to save document space and to improve the layout of your document. Use column breaks to move text to another column.
- **Hyphenation** – Using the Layout tab, page setup block, you can set automatic hyphenation and by choosing Hyphenation options, you can specifically set extra hyphenation criteria.

Page layout (Design tab):

- **Themes**
Makes it easy to combine colours, fonts, and graphic formatting effects across your Word documents. You can update them quickly. You can change the entire theme or just customize theme fonts, colours, or effects.
- **Watermarks**
Watermarks are text or images on the background of your document. It is usually used to indicate the status of the document e.g. COPY, EXAMPLE, DRAFT, FINAL etc.

Document layout:

Page numbers

- Page numbers can be set in the header or footer of your document by using the Header/Footer Design Tab. Access this tab by clicking inside the header or footer in your document.
- Remember that there are a lot of options regarding page numbers (start at, odd and even pages, format, style of numbering etc.) which you can set by using the DESIGN tab in the header or footer.

Page breaks

- Breaking a page will create a new page or move text to the beginning of the next page.

Section breaks

- Section breaks divide a document into individual sections, thus allowing changes to a section/sections that need to be formatted differently from the rest of your document.

Headers and footers:

- Displays descriptive information about the document.
- Page numbers, fields, graphics etc. are typical information to be placed inside headers and footers.

Fields:

- Fields help the user save time rounding off a document.
- Fields like date, path and filename will automatically set the dates, file paths and filenames etc. into the document.
- Fields are usually used in the header or footer of a document.

Cover page:

- Used to introduce the document to the reader.
- Cover pages supply important information about the content of a document.
- Cover page fields include the title of the document, related image/s, author, extract or small summary of the content of the document.
- Word supplies pre-set cover page templates – INSERT, COVER PAGE.

View options:

- View the print layout and preview your documents before you print it. Also gives you the option to view more than one page at a time, draft of a document or full screen reading of a document.
- Layout errors can be picked up quickly and rectified by using view options.

Insert and manipulate pictures and text (Insert tab/Format tab):

- **Pictures** – Insert and **manipulate** pictures using the FORMAT tab.

If the picture should be resized with **exact** measurements, remember to disable **Relative to original** and **Aspect ratio** size settings.

- **Clip art** – A gallery of images, arrange according to topics. Online gallery can also be accessed.
- **Word art** – Lets you modify text. This text can be manipulated e.g. borders, fill colours, gradients, shape effects, text effects etc. To do this, use the Format tab after you inserted the Word Art.
- **Shapes** – Use shapes to draw, group and manipulate. You can place text inside a shape by right clicking on the shape and choosing Add text.
- **Charts** – Insert charts into a document by choosing the type of chart and changing the data inside the spreadsheet that will appear.
Integration: Charts
You can also copy and link an existing chart from Excel. By linking it, you have the option to **UPDATE link** whenever the original chart is updated with new information. To do this, copy the chart and paste it with PASTE SPECIAL as a link.
- **Smart art** – a way to make organised presentation art e.g. **Organisational charts** and **Venn diagrams**. Show information in an organised way. It is easy to manipulate smart art by **adding**, **promoting** and **demoting** smart art shapes.
- **Text box** – We insert text boxed by drawing them in the desired place. Text boxes can be manipulated to required specifications like layout options, border options, size, format options etc.
- **Integration: Hyperlinks**
Hyperlinks can be placed on words, phrases and images.
When clicked the hyperlink would take the user to a different place in a document, to another document or a webpage.
- **Bookmarks** - Bookmarks are **locations, words or sections** in a document that can be named and identified for future use. Use the bookmark to quickly jump to certain words or sections in the document. Important to remember when **creating** a bookmark that it can contain text and numbers, but no spaces.

Paragraphs:

- **Line spacing** – Increasing or decreasing the space between lines of text.
- **Paragraph spacing** – Increasing or decreasing the space before and after a paragraph.
- **Indents** – Moving paragraphs away from margins.
 - **Left indent:** Moving paragraph inward from the left margin
 - **Right indent:** Moving paragraph inward from the right margin
 - **First line indent:** Moving the first line of a paragraph inward, but leaving the rest of the paragraph as is.
 - **Hanging indent:** Leaving the first line of the paragraph as is, but moving the rest of the paragraph inward.

- **Alignment** – how text is displayed in a document.
 - **Left alignment:** Selected text aligns with the left margin.
 - **Center alignment:** Selected text aligns horizontally in the middle of the document.
 - **Right alignment:** Selected text aligns with the right margin.
 - **Justified alignment:** The word spacing of selected text is adjusted to align with the left – and right margins of the document.
 - **Vertical alignment:** Selected text is aligned vertically over the page – options include top, centre and bottom.
- **Borders and Shading: Emphasis on paragraphs**
 - Placing borders around paragraphs with the borders and shading tool.
 - Shading the background of a paragraph with the borders and shading tool.

Tables:

- **Insert**, Table tools, Table design, Table properties
- **Design**, Table styles, borders and shading
- **Layout**, Rows and columns, header rows
- **Layout**, Cells: size, distribution, merging and splitting
- **Layout**, Text alignment and direction
- **Layout**, split rows, table, auto fit, gridlines
- **Layout**, sorting, convert to text and working with formulas

Reference:

- **Table of contents** – electronically created using styles applied to headings. REFERENCES, TABLE OF CONTENT.
- **Footnotes** – Supplies extra information or reference on a subject in the document. Can be set to display on the bottom of the page or beneath relevant text.
- **Endnotes** – Supplies extra information or reference on a subject in the document. Will appear at the end of the document.
- **Captions and table of figures** – Used to describe an image in a document. Captions help create an electronic table of figures as a reference element.
- **Citations** – Helps you cite your sources inside a document.
- **Bibliography** – An electronic list of sources used to compile a document. REFERENCES, BIBLIOGRAPHY. We can choose form international style sets for creating our bibliography like APA, Harvard etc.

Templates:

- Templates are documents that have been pre-created for ease and speed of use. Formatting, layout and set-up of the document has already been done in a professional manner.
- When you use a template, you personalise it with your data and information.
- You can also create your own templates – File, Save As, File type: Template

- **Examples of templates:** Letter, Fax, Report Agenda, memo, basic resume/CV

Online - and offline help:

- To access **online help** in MS WORD, just use the keyboard function key F1 when working in your document.
- To access **offline help**, you can type your question in the **TELL ME WHAT YOU WANT TO DO** space on your ribbon. You can also use the keyboard shortcut **<Ctrl> + <Q>**.
- **FAQs**
Frequently Asked Questions provide information on frequent questions that the user might have regarding the program that they are using. It consists of pre-set questions that might help solve a problem.

Styles – Home Tab

- Helps create consistency in your document.
- Helps to efficiently format your document.
- Creates efficient navigation options via tables of content, cross-referencing, hyperlinks etc.

- Quick style gallery

Styles are pre-set formatting options that are most commonly used in the creation of documents and are available in the Quick Style Gallery. You can remove or add new styles to your gallery.

- Style sets

Include a combination of title, heading, and paragraph styles. Allows you to format all the elements of a style at once.

- Create a new style

By opening the Styles block, choose **Create a Style**.

You can base your new style on an existing style and just change the formatting like you want it.

Reviewing and tracking changes:

- When you create an original document in Word, you can **track** any **changes** that were made during the creation of your document.
- Track changes is an **editing command** and tracks **which user** makes **changes** and **where** those changes were made. Track changes also gives the author a choice whether to **accept** or **reject** made changes.
- **Integration:** Track changes make it easy to collaborate on tasks by giving users the ability to work together on the same document with ease.

Electronic forms:

- Electronic forms allow you to **capture information** easily.
- Questionnaires can be drawn up and distributed electronically.

Integration: Import data collected via electronic forms.

In order to help you save time, this method allows you to **import data** directly from your forms into the **spreadsheet**. It is important to remember that the data should be in text format, thus either **.txt** OR **.csv** files can be imported into Excel.

Mail Merge:

- **Word** can use **data** from a **spreadsheet, database** or another **Word** document in a form letter, stickers, envelopes etc. In order for Word to accomplish this, you need to **link** the data file **to the document** you are going to use as the form/main letter.
- After the mail merge **has been completed**, remember to **SAVE** the merged document under a new name, as to not disturb your form letter.

Used to do a Mail Merge:

- Table/Query in a database
- Spreadsheets/CSV (comma delimited) file
- Contacts file e.g. in Microsoft Outlook
- Table in a word processing document
- Text file, etc.

Spreadsheets

Overview:

- Microsoft Excel is a **spreadsheet** program.
- It can be used to create tables of text and numbers and summarise it with calculations and functions.
- Businesses can use it to create budgets, record expenditures and income, chart and present data.

Cell reference:

- Each cell in Excel has an address, determined by using the column name and row number on the grid e.g. **B7**.
- Cell reference refers to the cell address or a range of cells in a sheet e.g. A2:B25.
- Cell references can be used in a function or formula in Excel.

Formatting sheets:

- Rows - Height can be adjusted to fit contents.
- Columns - Width can be adjusted to fit contents.
- Sheets - Rename according to data on sheet, change colour, hide sheet, create new sheet.
- Insert - rows, columns, pictures, shapes etc.
- Delete - columns, rows, data, sheets.
- Hide - columns, rows, sheets that you don't want displayed.
- Unhide - columns, rows, sheets that you want displayed.
- Borders - change style, width, colour, layout.
- Styles - preset formats used for a professional looking spreadsheet.
- Page layout - change orientation, margins of spreadsheet.

Sorting:

Excel will only sort data that was selected. Always make sure you include all fields in the table before attempting to sort.

Data types:

- **Text** - descriptive like names, places etc. and usually contains letters. Any piece of data that may start with a 0 is also classified as text e.g. cell phone number, postal codes etc.
- **Number** - Numbers are usually raw numbers or dates.
- **Currency** - Refers to money values and the type of currency e.g. RAND, EURO can be set in the number format settings in Excel.
- **Date and Time** - Dates and times can be used in functions. Date formats can be changed in the number format settings in Excel.

Formatting cells:

We format cells in order to make data stand out and to have a neatly formatted spreadsheet.

- Borders - Type, colour, width etc.
- Shading - by using shading, certain emphasis can be placed on cells.
- Alignment - Horizontal: Left, Centre, Right and Vertical: Top, Centre, Bottom
- Wrapping - Helps to display all text in a cell, even when it overflows.
- Merge - combines two or more cells into a larger cell.
- Text direction - helps orientate text inside a cell.
- Split - merged cells can be unmerged into original cells.
- Auto fill - helps create data based on the data and patterns from other cells.
- Conditional formatting - allows you to format cells according to certain criteria.

Work with sheets:

- Rename - Change the name of sheets to the type of data they carry.
- Headers and footers - set page headers and footers that will appear on each page in the spreadsheet.
- Printing - set print area to include entire workbook, sheets or partial sheets, pages etc.

Difference between file formats:

- .xlsx is a typical Excel file format that saves data, graphs, pivots etc.
- .txt is a text file containing no formatting.
- .csv is a flat text file that uses delimiters to separate data e.g. a comma.

Formulae vs. functions:

- Formula - a user defined calculation.
- Function - a built-in Excel calculation.

Basic calculations:

Uses basic operators including +, -, *, /, order of precedence and the use of brackets.

Basic functions:

- **Sum** - sums data in a range of cells.
- **Average** - averages the data in a range of cells.
- **Count** - counts the cells that contain data in a range.
- **CountA** - counts the cells that contain text in a range.
- **Min** - Returns the minimum in a range of cells.
- **Max** - Returns the maximum in a range of cells.
- **Today** - Returns the current date.
- **Now** - Returns the current date and time.

- **Rand** - Returns a random number between 0 and 1 e.g. 0.4 .
- **Randbetween** - Returns a random whole number between x and y e.g. 26.
- **Round** - will round a value to x decimal places.
- **Mode** - Returns the number that is repeated the most in a range.
- **Median** - Returns the middle number if you sort the range in an ascending order.
- **Countif** - Returns number of times a criteria was matched in a range by using relational operators (><<= >= <> =).
- **Countifs** - Returns the number of times a criteria was matched in a range by using relational operators (><<= >= <> =) **BUT** you can supply more than one criteria at a time.
- **Sumif** - Add/sums all the numbers in a range of cells based on criteria
- **Sumifs** - Add/sums all the numbers in a range of cells based on criteria **BUT** you can supply more than one criteria at a time.
- **Large** - Returns the x largest value in the range.
- **Small** - Returns the x smallest value in the range.

Absolute cell referencing:

When entering a cell reference in a function or formula, Excel will assume it is a relative reference and will change or adapt the reference when the function or formula is autofilled. With an absolute reference the range reference or cell reference will not change when autofilled. Achieve absolute cell referencing by adding a \$ to the front of the column and/or row number in the cell referencing e.g. \$B\$14.

Simple IF function:

- Returns one value if a condition is TRUE and another value if condition is FALSE.
- Use of relational operators (> < <= >= <>) in simple IF functions.

More complex functions:

- **Nested IF** - Tests for multiple criteria. Increases the possible outcomes if TRUE.
- **Vertical lookup** - Looks up a value in the first column and returns the value next to it in the second column. #N/A error - function can't find referenced value.
- **Horizontal lookup** - Looks up a value in the first row and returns the value below to it in the second row. #N/A error - function can't find referenced value.
- **Roundup** - will round upward.
- **Rounddown** - will round downward.

Subtotal feature

The subtotals command allows us to group data in a spreadsheet and apply common functions to the groups to help summarize our data e.g. sum, count, average

Date and time calculations:

- **Month** - returns the month of a specified date.
- **Year** - returns the year of a specified date.

- **EDATE**- returns a date in months before or after the start date.

Text functions:

- **Left** - Extracts text from the left of a string.
- **Right** - Extracts text from the right of a string.
- **Mid** - Extracts text from an indicated point inside of a string.
- **Concatenate** - Combines text.
- **Len** - determines the length of a string.
- **Value** - converts text to a numeric value.
- **Find** - returns the position of specific text inside a string.

Error indicators:

- **#NUM** - error indicating numeric values that are not valid. Enter a valid numeric value.
- **#####** - error indicating that the column is too thin for data to show. Change the column width.
- **#NAME** - error signifies that something needs to be corrected in the syntax of a function. Check the syntax of your function.
- **#DIV/0!** - error indicates that no division by 0 can take place. Check your formula.
- **#REF!** - error indicates that function refers to a cell or range that no longer exists.
- **#VALUE!** - error indicates that there is something wrong with your function or referencing inside the function.

Graphs:

Types of graphs:

- **Pie** - to indicate percentages or proportional data.
- **Line** - to track changes over periods of time.
- **Column/Bar** - compare information/data between groups.

How to improve the readability of a chart:

- Appropriate chart title.
- Label the axis.
- Use a legend.
- Changing the scale on the axes.
- Add Minimum and maximum values.
- Use graphics.
- Add or remove gridlines.

Database:

Objective:

Microsoft Access is a database application that helps manage large amounts of data and allows analyses of information.

Objects:

- **Tables** – Contains records in the database.
- **Forms** – Allows for easy entry of records in a database table because you can edit each record individually.
- **Queries** – Requests and extracts specific data adhering to criteria.
- **Reports** – Displays and prints data in a neat and organised manner.

Tables:

- **Record:** Every cell/field in a single row is part of a single record in a table. A record is one unit of information.
- **Field name:** Column names in a table are referred to as field names. The fields below them will contain data for that field name for each record.
- **Properties:** The setting of properties will help to ensure fewer errors when data is captured into a table.
 - **Size** – this property helps to restrict the size of a field.
 - **Format** – Helps to set formats like currency, type of number, type of date etc.
 - **Input Mask** – String of characters that indicates the format of a valid input inside a field.
 - **Default Value** – The value a field will start out with. You can change this value individually if it differs for a specific record.
 - **Required** – If this property is set to YES, each record you enter needs to have a value for that specific field.
 - **Validation rule** – This property can restrict input inside a field to only the input that is allowed.
 - **Validation text** – Provides a helpful message to users who's input does not comply with the validation rule that was set up for a field.

Data types:

Purpose of data types:

By setting and using data types to create tables in Access we ensure that the correct type of data will be entered into the fields of a specific table. This helps to ensure less errors when data is captured.

- **Short Text** – Field can store up to 255 characters, spaces included.
- **Longer Text** – Character limit can be changed to accommodate up to 4000 characters.
- **Number** – Allows us to choose the kind of number formats to be used in a field e.g. Integer, Byte, double, decimal etc.
- **Date and Time** – This data type is used in fields that has a date as data entry.
- **Currency** – Any field that requires currency like RAND, EURO etc. should have this data type set to assure entry of data will be changed to the correct form of currency.
- **AutoNumber** – This data type will automatically number each record in a table. Each auto number will be unique to its record. When a record is removed, the specific automated number will also be removed. Auto number fields are great to use as a primary key field for this reason.
- **Yes/No** – These types of fields will only store one of two values, Yes or No.
- **OLE Object** – This data type allows the storage of an image in a field.

- **Attachment** – Allows many types of documents to be stored inside a field in a table as an attachment.
- **Hyperlink** – Store clickable links to documents, websites etc. in a field in an Access table.
- **Lookup Wizard** – This wizard helps create combo box - or list box options for a field inside a table.

Queries:

Purpose of a query:

A query is a request for data results using criteria, calculations, grouping and totals.

- Basic queries are created using AND, OR and sorting.
- We can use wildcards */ to extract data.
- Calculation fields can be created in order to apply calculations to data.
- By using Totals and Groups we can total and/or group results of queries according to particular settings.

Reports:

Purpose of a report:

A report is an organised way in which you can print and distribute information in a database.

Basic calculations in a report:

Calculations can be done in the report footer. These calculations will be applied to data from the entire report.

- **Sum** - totals data in a field.
- **Avg** - averages the data in a field.
- **Count** - counts the records in the report.
- **Min** - returns the smallest value in a field.
- **Max** - returns the largest value in a field.

Grouping and grouping calculations:

- Grouping can be applied to fields in a report. If applied, the report would group on the field/s you chose e.g. **Gender**.
- All the basic calculations that you can apply to the report footer, can also be applied to any grouping footer. The difference is that a calculation in the grouping footer will be applied to each group, rather than the whole report.

HTML:

What is HTML?

Hyper Text Markup Language is a language used to create web pages with. We view these pages with a web browser e.g. Firefox, Safari, Chrome etc.

What is an HTML editor?

An **HTML editor** is a program that we use to create html web pages with e.g. **Notepad++**.

HTML syntax:

Syntax refers to the spelling and grammar of a programming language.

Basic HTML tags:

Most **html tags** require us to use an opening - and closing tag in order to indicate a starting and finishing point.

Main tags:

- **<html> </html>** - indicates the start and end of an html document.
- **<head> </head>** - indicates that we are working on the tab of the web page.
- **<title> </title>** - indicates the name on the tab in the browser.
- **<body> </body>** - indicates the start and end of the contents of the web page.

Heading elements:

- **<h1>** to **<h6>** - indicates a heading on a web page.

Text elements:

- **<p> </p>** - indicates the start and end of a paragraph.
- **
** - indicates a line break.
- **<hr />** - indicates a horizontal rule/line.

Text formatting:

- ** ** - allows to change attributes to text between tags e.g color, align, face etc.
- ** ** - bold the text between the tags.
- **<i> </i>** - italic the text between the tags.
- **<u> </u>** - underline the text between the tags.

HTML links:

- Link syntax: ****This is a link ****
- Bookmark attributes: **** and **link ** Go to abcd ****

HTML images:

- Syntax: ``
- Attributes: source and alternate text

HTML lists:

- Numbered list: ` `
- Bulleted list: ` `
- List items: ` `

Attributes:

Attributes define additional characteristics of an html element.

Elements include:

- bgcolor - set background color.
- color - set text color or line color.
- align - alignment of elements.
- type - the type of element.
- size - text size.
- height - height of element in pixels.
- width - width of element in pixels.
- face - define the font of text.

HTML tables:

Table tags:

- `<table> </table>` - indicates the beginning and end of a table.
- `<th> </th>` - indicates a field name in a table.
- `<td> </td>` - indicates a cell containing data in a table.

Table Attributes:

- border - sets the border type.
- bgcolor - sets the background color for the table/cell.
- cellpadding - indicates the distance from the data in the cell to the border.
- cellspacing - indicate the distance between cells.

HTML comments:

Comments are not displayed in your web page. They are used to leave notes inside the page's code.

Syntax for a comment: `<!-- Write your comments here -->`

Good website/page design:

- Good use of colour (basic).
- Typography - must be readable.
- Layout - neat and structured, all pages must form a coherent website.
- No dead links - links should work.
- Visually appealing.

Solutions Development Activities

Activity 1

1. Name the word processing tool which we can use to view formatting marks on the screen when editing a document.
2. To make it possible to change the orientation of a specific page in a multi-page document, we need to use a break. Name the specific type of break we should use.
3. Consult the following word processing list and answer the questions that follow:
 1. **Gauteng**
 - 1.1. Johannesburg
 - 1.2. Pretoria
 2. **Western Cape**
 - 2.1. Cape Town
 - 2.2. Paarl
 3. **KwaZulu Natal**
 - 3.1. Durban
 - 3.2. Richards Bay
- 3.1 What type of list tool was used to create the list above?
- 3.2 Give the type of indent created at list level 2.
4. When working with a document, how can we ensure that certain words like the date in the example, will always stay together on the same line when the line breaks? e.g. **25 October 2020**.
5. Describe how Freeze Panes work in a spreadsheet and its functionality.
6. What type of data is best reflected by the use of a pie chart?
7. In Excel, why would you rather use a lookup table and lookup function instead of a nested-if function?
8. Look at the following HTML code. The code gives an error. Correctly rewrite the code in order for it to work in a browser.

` CLICK LINK TO READ MORE `

Activity 2

1. Study the data in the given Access table and answer the questions that follow:

Surname	School	Cell Number	Fee
Smith	The Glen	0724458585	R250
Nkomo	Willowridge	0825545565	R250
Jackson	Sutherland	0614221214	R250
Botha	Nelspruit	0826599878	R250

- 1.1 Which data type should be used in the **Cell Number** field? Give a reason for your answer.
 - 1.2 Name the property in the **Fee** field that can be set to R250.
 - 1.3 Why can't we set that same particular property (1.2) for the **Cell Number** field to 0724458585 for example?
 - 1.4 Which of the fields in the table could be set up as a primary key? Give a reason for your choice.
 - 1.5 Write a usable Input Mask for the Cell Number field.
2. What is the most significant difference between a **.xlsx** file and a **.csv** file?
3. **Look at the following Excel function:**
`=Sumifs(C2:C50,">100",F2:F50,"RUGBY",H2:H50)`

The aim of this function is to sum the data in H2:H50 if the two conditions in C2:C50 and F2:F50 are met.
- 3.1 Why would this function return an error?
 - 3.2 Rewrite the function to eliminate the error.
4. How is it possible not to show data in an excel spreadsheet without deleting it?
 5. Describe the difference between a First line - and a Hanging indent when using a word processor to create a document.
 6. Why would you typically use the COMMENT utility in a word document?
 7. In order to help create an electronic table of content, what type of word processing function should one use on the headings and subheadings in the document?

Activity 3

1. Give **two** advantages of creating and using electronic forms in a word processing program like MS WORD.
2. Why would you want to create a form letter and a mail merge?
3. Describe the differences between the **COUNTIF** function and **COUNTIFS** function in an Excel spreadsheet.
4. In order to show data changes over a period of time like a year (per month), what type of chart would you use to show results to best effect?
5. Name 3 elements, changes you can add/enhance in any chart to help with readability/interpretation of the chart.
6. Why would Excel give the following error when you enter a function or formula? **#Value!**
7. In a database, why would it be a good idea to create a form from an existing table?
8. Look at the HTML code and answer the questions that follow:

```
<!-- Indent --> <h1> COVID19 INFORMATION </h1>
```

- 8.1 Correct the html error in the code.
- 8.2 What will the output of this specific code be in the browser? (What will you see on the page when looking at this specific piece of code in the browser)

Activity 4

1. Study the following Excel table and answer the questions that follow:

	A	B	C	D	E
1	Name	Time In	Time Out	Total	PAID
2	Jim	08:00	13:00	5	
3	Thabo	08:00	11:00	3	
4	Mitch	09:30	15:30	6	
5	Suzan	10:00	18:00		

- 1.1 Write a formula that should appear in cell **D5** that will determine how many hours **Suzan** worked today.
- 1.2 The following guidelines exist in determining how much each worker should

be paid.

- ≤ 3 hours - R100 per hour
- ≥ 4 hours - R180 per hour

Look at the following function that is already in **E2** and **amend** it in order to include all the options to work out how much Jim will be paid. Remember that the function should be writing in such a way that it can be auto filled to the other cells in the column.

`=IF(D2>=4,D2*180)`

2. Write down 2 ways/methods in which you can help eliminate data capture errors in an Access table.
3. Why would you want to design a report in Access? Give two reasons.
4. What will the reason be for using a Text Box tool when designing a report in Access?
5. A query uses the following criteria in a given field: **IS NOT NULL**
What kind of result would be expected with such a criteria?
6. What is the function of a tab leader in a word processing document?
7. What type of error is indicated with a blue zig-zag underneath a word or phrase in a Word document?
8. Give the name for the tool in Microsoft Word, which will generate a synonym for a selected word.

Activity 5

1. Inspect the following text taken out of a word processing document and answer the questions below:

There will always be those who choose with their heart instead of their mind, and we should respect their choices. When given a choice, it is up to the individual to decide in which direction he/she wishes to go. ¶

Making good decisions requires us to balance the seemingly antithetical forces of emotion and rationality. We must be able to predict the future, accurately perceive the present situation, have insight into the minds of others and deal with uncertainty. ↵

- 1.1 Name the element that has been used to create the large letter **T** in the first paragraph.
- 1.2 What is the formatting indicator indicating at the end of the last line of the second paragraph?
- 1.3 How many spaces should there be between any two words in a sentence

when creating professional documents?

2. How is it possible for the user to view non-printing, formatting indicator symbols in a word processing document?
3. Indicate the difference between using a **<th>** tag and a **<td>** tag when coding an html table in an html editor.
4. Why would you use the following code in the design of a web page?
Note: Any name can be entered between the quotes.

```
<a name=" " > </a>
```

5. Examine the error message received in an excel spreadsheet.

#DIV/0!

What caused this error?

6. When designing a database table, why would it be a good idea to use a lookup like a list box or combo box in a particular field? Give two reasons.
7. What would the reason be for someone to set a primary key property on a field in an Access table?
8. How would an Access query interpret the following criteria when determining results?

*Like "*9"*

Activity 6

1. When doing a spellcheck in a document, when would you use the ADD TO DICTIONARY option?
2. What is the purpose of headers and footers in programs such as MS WORD and MS EXCEL?
3. Why would someone press the F1 key while working in a program?
4. Explain the difference between the following two validation rules in an Access table:
 - Between 18 AND 50
 - <=18 OR >=50
5. What is the purpose of Validation text?
6. To ensure that every cell in a field contains data, which property could be activated for that particular field?
7. What tool can be used to add text to a report like for example your name, grade and class inside a report footer?
8. Why would you use a CONCATENATE function in Excel?

Activity 7

1. Give two reasons why a small business owner would use a database program like Microsoft Access for his business?
2. Why would you typically create an input mask for a field in an Access table?
3. Look at the following list of field names in a table in Access and answer the questions:
Id number: Student's ID number
Surname: Student's surname
Name: Student's name
Age: Student's age
Camp fee: Cost of camp
- 3.1 Which data type would you use for the **Camp fee** field?
- 3.2 Name any two fields that would not be appropriate to use as primary keys and give a reason why they wouldn't be appropriate.
- 3.3 What data type would you assign to the **ID number** field in this table?
4. Why should you select all the fields and records in a Word table before performing a sort command on the table?
5. When showing a learners' end of term marks for each subject on a chart, what type of chart would you recommend be used to show this information?
6. Explain the difference in results when using a COUNTIF - and a SUMIF function in a spreadsheet in Excel.
7. To generate a random number between 1 and 50 in Excel, what would the function that you would use look like?
8. Rewrite the following HTML code to create a blue table background and change the space between the cell border and the text in the cells to 5.

`<table cellpadding="3" cellspacing="3" border="1">`

Solutions Development Past Exam Papers

November 2012

Mr Joe has to solve several problems regarding computers and the work learners are doing in the computer centre.

- 7.1 Mr Joe has asked some learners to help him in the computer centre in the afternoons.

He has created a spreadsheet to calculate the times worked by each learner.

Study the extract from the spreadsheet below and answer the questions that follow.

	A	B	C	D	E	F
1	Computer Centre Helpers					
2	Surname	Name	Class	Time In	Time Out	Hours worked
3	PODILE	Mpho	12C	12:30	16:00	03:30
4	MARX	Liena	11B	14:15	18:00	03:45
5	SERUMULA	Mohamed	11B	15:30	17:30	02:00
6	PUDIKABEKOA	Dzuni	11C	14:15	17:30	03:15
7	WIESEMAN	Owen	11A	15:15	18:00	02:45
8	MANTSINA	Jannie	12C	15:30	17:30	02:00
9	ESTERHUIZEN	Jan	12A	14:15	16:00	01:45
10	MSIMEKI	Linda	11B	12:30	16:00	03:30

- 7.1.1 Mr Joe wants to copy the names of only the learners in 12C. Suggest a way in which Mr. Joe can extract the names of the learners in Grade 12C without copying each name separately. (2)

- 7.1.2 Which formatting feature did Mr Joe use to place the heading in one cell across all the columns in the first row? (1)

- 7.1.3 Mr Joe wishes to know how many hours each learner worked. He used the formula **=E3-D3** (Time Out minus Time In) but found that the number of hours display as a time, for example 03:30 instead of 3.5.

State TWO changes Mr Joe should make to display the number of hours correctly. (2)

- 7.1.4 Mr Joe needs to have the same information which appears in the spreadsheet, in a database application. Which feature of an office package can he use to achieve this? (1)

- 7.1.5 The chart/graph below compares the times the learners have worked in the computer centre.

Suggest a more appropriate type of chart/graph to display and compare the data. (1)

7.2 Mr Joe wishes to place the information below in a database table.

SURNAME	NAME	CLASS	CELL NUMBER	HOURS WORKED
PODILE	Mpho	12C	083 380 1353	14
MARX	Liena	11B	074 323 5891	18
SERUMULA	Mohamed	11B	073 898 9458	21
PUDIKA BEKOA	Dzuni	11C	084 953 2262	25
WIESEMAN	Owen	11A	072 516 5875	17

7.2.1 Which field should Mr Joe set as the primary key field?

Motivate your answer. (2)

7.2.2 Learners may not work more than 30 hours. Name the field property that Mr Joe must set so that numbers larger than 30 cannot be entered into the Hours worked field. (1)

7.3 The school principal requires a printed document that displays the names, surnames and hours worked of all the learners who helped in the computer centre.

7.3.1 Which database object would be most suitable to create and save a list of the learners in Grade 11B who worked more than 15 hours? (1)

7.3.2 How would you calculate and display the number of records in a database report? (2)

[13]

November 2013

Ms Cloete has in the past received the following enquiries from parents and learners and has decided to include them in the questionnaire.

7.1 Some of the applications typically used in a small business are:

- Spreadsheet application
- Word processing application
- Database application
- E-mail software
- Web browser software.

Choose TWO of the applications from the list above and state the use or function of each of these two applications in a small business. (2)

7.2 Study the spreadsheet below and answer the questions that follow.

	A	B
1	Prizes for the Questionnaire Project	
2		
3	Item	Value
4	7" Tablet	2500,50
5	Notebook Computer	3900,95
6	Digital Camera	8500,20
7	Total	0.00

7.2.1 Suggest a change to the formatting of cells B4:B7 to automatically display the 'R' symbol for each value. (1)

7.2.2 The screenshot above shows a result of 0.00 in cell B7 for a correct function that was entered as =SUM(B4:B6).

How must the spreadsheet be changed to obtain the correct result from the function? (2)

7.2.3 Suggest ONE way in which the formatting can be changed to make it easier to read or interpret the spreadsheet. (1)

State TWO ways in which she can check whether the work has been copied from the Internet. (2)

[8]

November 2014

8.1 You have studied web page development in your CAT course.

8.1.1 What is the name of the language that uses tags and attributes to create web pages? (1)

8.1.2 What is the difference in function between the and tags used in the code for a web page? (2)

8.1.3 Give **TWO** possible reasons why an image you added on an HTML web page does not display when viewed in a web browser. (2)

8.2 Businesses regularly use databases.

8.2.1 The names of various schools are listed in a field in a database table. Which criteria would you enter in a query to extract the names of all the schools that have the word 'business' anywhere in their name? (2)

8.2.2 State **TWO** advantages of/reasons for using codes instead of the 'full text' in a database, for example 0847 instead of the text 'Business Studies'. (2)

8.3 Spreadsheets are commonly used to analyse data.

8.3.1 Name a feature of a spreadsheet program that can be used to automatically highlight cells if they contain specific values. (1)

8.3.2 The function below was used in a spreadsheet to count the number of cells in the range **A1:A10** that contain values of 50 or higher.

=COUNTIF(A1:A10,<50)

Give **TWO** reasons why this function will **NOT** work correctly. (2)

8.3.3 Which feature within a spreadsheet program can be used to display words underneath one other within the same cell? (1)

8.4 State **TWO** advantages of using the 'Track Changes' feature of a word processing program. (2)

[15]

November 2015

8.1 A word processing application allows a user to create a mail merge.

8.1.1 State TWO possible data sources that can be used for a mail merge. (2)

8.1.2 Why do you need to insert merge fields into a mail merge document? (1)

8.2 Study the following screenshot from a spreadsheet:

	A	B	C	D	E
1	Name	Surname	Age	Working	Pension
2	Ben	Franklyn	50	Yes	=IF(AND(C2>=60,D2="No"),"Pension", "")
3	George	Washington	67	No	
4	Barak	Obama	52	No	
5	Ronald	Reagan	61	No	

8.2.1 Examine the function in cell E2.

Explain, in your own words, the **TWO** criteria for a person to qualify for a pension according to this function.

Do **NOT** quote from or refer directly to the function in your answer. (2)

8.2.2 What would the function display in cell **E2**? (1)

8.3 Give ONE example of where or why you would use the 'paste special' feature of a spreadsheet program instead of the normal paste function. (1)

8.4 The HTML code of a web page contains the following line:

<!-- School information here -->

8.4.1 What is the purpose of this type of HTML code (tag)? (1)

8.4.2 What is displayed by this HTML code when the web page is displayed in a browser? (1)

8.5 What is the purpose of adding the 'Alt' section in the HTML code below?

 (1)

8.6 Study the screenshot below of the structure of a table that was created to keep track of items that a computer shop has in stock.

Field Name	Data Type	
StockID	Number	Unique number assigned to each item
Category	Text	The item category, e.g. CPU, motherboard, RAM, etc.
Description	Text	The specific model, e.g. Intel i5 2.5 GHz
Number in Stock	Number	The number of items currently in stock
Price per unit	Currency	The price each unit will be sold for

8.6.1 Why would it **NOT** be necessary to set the properties of the **StockID** field to be a required field? (1)

8.6.2 Which feature or property could be used in the Number in stock field to ensure that no number **larger than 100** can be entered? (1)

8.7 Processors are listed in the Category field as CPU.

The query below (based on the Stock table described in QUESTION 8.6) was created to find all the CPUs of which there are fewer than 10 in stock.

Field:	[StockID]	[Category]	[Description]	[Number in Stock]
Table:	Stock	Stock	Stock	Stock
Sort:				
Show:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Criteria:		"CPU"		
or:				<10

8.7.1 Briefly explain why this query will NOT return the correct data AND how it can be corrected. (2)

8.7.2 Which field in this query will NOT be displayed when the query is run? (1)

[15]

8.1 Study the screenshot below and answer the questions that follow.

	A	B	C
1	Wood prices		
2			
3	Wood Types	Length	Unit price
4	Pine	2.4	#N/A
5	Oak	2.4	#N/A
6	Pine	3	#N/A
7	Pine	2.4	#N/A
8	Oak	4.2	#N/A
9	Bluegum	4.2	#N/A
10			
11			
12	Price per unit		
13	Pine	R 55.00	
14	Oak	R 79.00	
15	Bluegum	R 71.00	

8.1.1 Cells **C4:C9** should display the relevant unit price from the data in the cell range **A12:B15**, depending on the value in column **A**.

The following function was used incorrectly in cell **C4**:

`=VLOOKUP(B4,A13:B15,1)`

Identify the **TWO** errors in the function. (2)

8.1.2 Why will the formula `= A4*B4` produces an error message? (1)

8.2 What is the difference in use between the **COUNT** and the **COUNTA** spreadsheet functions? (2)

8.3 Why should one use the **ROUND** function in a spreadsheet to round off numbers, instead of just formatting the numbers? (1)

8.4 In each of the following cases, name the word processing feature that must first be used or applied before it will work:

8.4.1 Automatic table of contents (1)

8.4.2 Automatic bibliography (1)

8.5 Give an example of a program (NOT a website) that can be used to edit HTML files. (1)

8.6 What is the relationship between a web page and a website? (1)

8.7 What is the connection between the `<head>` section of an HTML web page and the information displayed in the browser tab? (1)

8.8 Identify TWO mistakes in the following HTML code:

```
</ul>
```

```
<li>Item 1</li>
```

```
<li>Item 2</li>
```

```
<ol>
```

(2)

8.9 What is the main reason for using a form in a database?

(1)

8.10 The following appeared in a query:

Total: [T1]+[T2]

What effect does a calculation in a query have on the values in a database table?

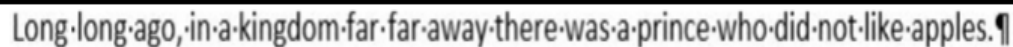
(1)

[15]

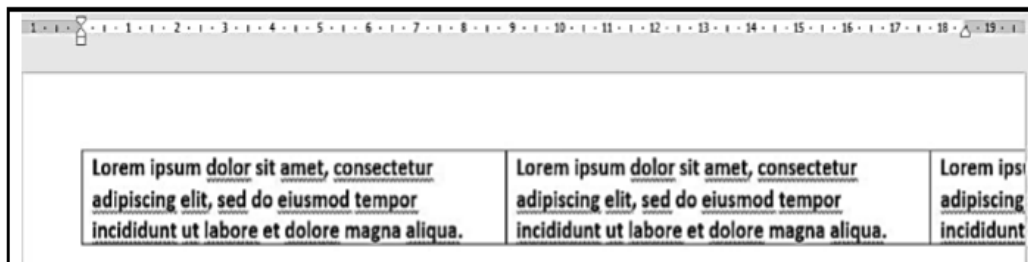
November 2017

8.1 Why would one turn on the formatting symbols, as is done in the screenshot below?

(1)



8.2 Look at the screenshot of a table below and answer the questions that follow.



Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua.	Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua.	Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua.
---	---	---

8.2.1 What is the current width of the page without the margins?

(1)

8.2.2 Suggest a way to reduce the number of cells in the table WITHOUT deleting any text.

(1)

8.2.3 State TWO general ways to configure the spell checker to get rid of the automatic underline.

(2)

8.2.4 The table in the screenshot above is too wide to display correctly.

Suggest ONE way to make the table fit on the page.

(1)

8.3 The ACTUAL size of an image called 'google.jpg' is 1080x900.

This image should display smaller when the following HTML code is executed:

```

```


- 8.3.1 How does the image size specified in the HTML code affect the original size of the image saved on a disk? (1)
- 8.3.2 Why does the displayed image appear distorted? (1)
- 8.3.3 Comment on the accessibility of the image in the web page for blind users. Motivate your answer. (2)
- 8.4 Look at the screenshot of a spreadsheet below and answer the questions that follow.

	A	B	C	D
1	Property	Type	Area	Price
2	785910	House	Rosebank	R 2 300 000,00
3	678264	Townhouse	Annlin	R 880 000,00
4	654652	Duplex	Silverton	40000

- 8.4.1 Give the term for the feature that was applied to give the 'Value error' dialog as a result. (1)
- 8.4.2 What is the purpose of the dropdown buttons next to the column headings in the image? (1)
- 8.4.3 A named range has been defined in the spreadsheet above. What is this named range called? (1)
- 8.4.4 You need to export the data in the spreadsheet to a database. Which field would you choose as a primary key? Explain the reason for your choice. (2)

[15]

November 2018

- 8.1 Give ONE reason why words such as 'color' and 'favor' (instead of the expected 'colour' and 'favour') are NOT identified as spelling errors when you do a spell check on a word processing document. (1)
- 8.2 Give TWO possible reasons why a main mail merge document fails to load the data source when you are trying to open it. (2)

8.3 The database table below was created to capture learners' test marks.

Copy the table below into your ANSWER BOOK and complete it by adding a suitable data type for EACH of the THREE remaining fields (8.3.1 to 8.3.3).

Field Name	Data Type
Name	Text
ID Number	8.3.1
Date of Test	8.3.2
Mark	8.3.3

8.4 a spreadsheet? (3)

8.5 The following error message is displayed in a spreadsheet cell: **#VALUE!**
Explain how you would correct the error that causes the message above to appear. (2)

8.6 The two underlined arguments in the function below prevent the function from working correctly when copied down:

=VLOOKUP("A1", L1:M5, 2, FALSE)

Suggest ONE correction for **EACH** of the **TWO** underlined arguments.

(Do NOT refer to the spaces in the function in your answer.) (2)

8.7 Suggest ONE function that can be used to replace the whole formula in **EACH** of the following cases:

8.7.1 =A1&A2&A3 (1)

8.7.2 =(A1+A2+A3+A4+A5)/5 (1)

8.8 Explain the purpose of **EACH** of the following **HTML** tags:

8.8.1 (1)

8.8.2 (1)

[15]

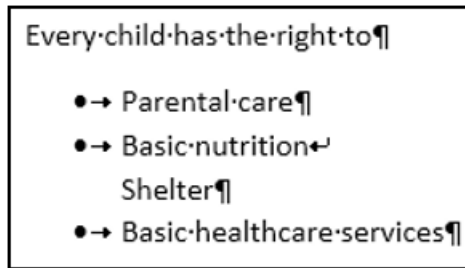
November 2019

8.1 Give ONE benefit of using styles for headings in a long word processing document. (1)

8.2 Suggest TWO reasons for using section breaks in a word processing document. (2)

8.3 Name TWO word processing features that a reviewer can use to indicate suggested changes to the author of a document. (2)

8.4 Study the screenshot of a word processing document below.

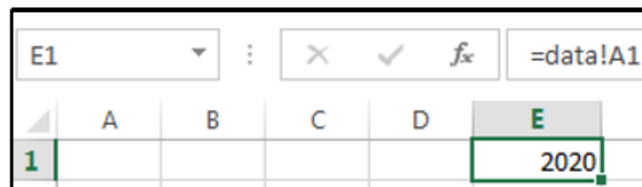


8.4.1 Why do the non-printing symbols display in the document? (1)

8.4.2 Why does the word 'Shelter' appear without a bullet? (1)

8.5 How would you use the Page Break Preview of a spreadsheet to manipulate the number of rows or columns printed per page? (1)

8.6 What does the exclamation mark (!) in the formula bar for cell E1 indicate in the screenshot below?



(1)

8.7 Study the screenshot below. The formula used in cell D3 to obtain the **time worked** is correct, although it is not displaying the correct answer.

	A	B	C	D	E
1					
2		Time in	Time out	Time worked	
3		11:00	13:00	12:00:00 AM	
4					

What cell formatting must be applied to cell **D3** to obtain the correct answer of **2 hours**? (1)

8.8 The formula in cell **B2** was copied down to calculate the **VAT** (cell E1) for all amounts in column **A**.

	A	B	C	D	E	F
1				VAT	0.15	
2	R 45.00	R 6.75				
3	R 65.00	R 0.00				
4	R 78.00	R 0.00				
5	R 23.00	R 0.00				

Identify **TWO** mistakes in the formula that prevent the values in the cell range **B3 to B5** from displaying correctly. (2)

8.9 Consider the formula `=[Price]*[Markup]`, used in a calculation in a database query or report.

Why are **square brackets** used in this formula? (1)

8.10 What would happen if a `=COUNT(*)` function was moved from the group footer to the report footer in a database? (1)

8.11 What needs to be done for the text 'December holidays' to display on a web browser tab?

```
<html>
  <head> December holidays
    <title> </title>
  </head>
  <body> </body>
</html>
```

(1)

[15]

Solutions Development Activities Solutions

Activity 1

1.
 - Show/Hide
2.
 - Section break
- 3.1
 - Multi-level list
- 3.2
 - Hanging indent
4.
 - Soft spaces between the words **(Ctrl) + (Shift) + SPACE**
5.
 - Excel keeps specific rows and columns in place when you scroll through the spreadsheet.
 - Helps to view a lot of records more easily .
6.
 - Percentages of a whole.
7.
 - A lookup table allows for more values to be looked up, where a nested-if can only test up to 7 possible options.
8.
 - "www.howstuffworks.com" The quotes were missing.

Activity 2

- 1.1
 - Short text OR Text
 - Numbers do not start with a zero like cell numbers or codes etc.
- 1.2
 - Default value
- 1.3
 - Because everyone has a different cell number.
A default value should be the value that will most likely be entered into a cell.
- 1.4
 - Cell Number.
 - This field will not contain any duplicates.
- 1.5
 - 0000000000 (ten zero's)
2.
 - A .xls file is a **formatted** spreadsheet file.
A .csv is a comma delimited file that doesn't contain any **formatting**.
- 3.1
 - The sum range is in the wrong place inside the function
- 3.2
 - =Sumifs(H2:H50,C2:C50,">100",F2:F50,"RUGBY")
4.
 - Hide it (hide row/hide column)
5. With a First line indent, only the first line in a paragraph is indented, but with

a hanging indent, the first line stays where it is and the rest of the paragraph is indented.

6.
 - It is a note that a reviewer or author can add to the document to inform the user of something that needs to be looked at or requires attention.
7.
 - Styles

Activity 3

1.
 - Information could be captured more easily
 - Forms could be sent electronically via email
 - Updating information received would be made easier
 - Paper would not be wasted from printing forms
2. We would want to create form letters in order to mail merge data to be sent to multiple recipients ✓ by emailing them or printing the letters.
(Recipients would only receive letters with data relating to them or their accounts.)
3.
 - The COUNTIF function will evaluate one criteria in order to count a cell or not.
 - The COUNTIF function will evaluate more than one criteria in order to count a cell or not.
4. Line chart
5.
 - Appropriate chart title.
 - Label the axis.
 - Use a legend.
 - Changing the scale on the axes.
 - Add Minimum and maximum values.
 - Use graphics.
 - Add or remove gridlines.
6. There is an error with the data referenced in the function - it could be referencing cells that contain text.
7. A form helps to view and enter records one at a time.
- 8.1 `<h1> COVID19 INFORMATION </h1>`
- 8.2 COVID19 INFORMATION (the comment should not appear here)

Activity 4

- 1.1 `=(C5-B5) *24`
- 1.2 `=IF(D2>=4,D2*180,D2*100)`
 - ,
 - D2
 - *100
2.
 - Correct data type
 - Input mask
 - List
 - Default value
 - Required set to YES
 - Validation rule and text
 - Primary key
3.
 - To submit data in a neat and professional way
 - To print/publish data
4. We use a text box to create calculations in a report.
5. Such criteria will give results where the cells of a field are not empty.
6. A tab leader helps to lead the eye in order to make a document more readable.
7. A language error.
8. A Thesaurus

Activity 5

- 1.1
 - Drop cap
- 1.2
 - Line break
- 1.3
 - One
2.
 - Activate the Show/Hide button on the HOME tab
3.
 - `<th>` This tag is used to indicate a column heading inside a cell in a html table
 - `<td>` This tag is used to indicate data in a cell in html
4.
 - To create a named anchor in order to use as a reference point to a bookmark in a hyperlink
5.
 - Function references division by 0
6.
 - By using a list box it will speed up the entering of data into a table
 - By using a list box it will help to eliminate data entry errors

7. Primary keys indicate fields that will contain unique data, by not allowing duplicate values/entries to be accepted
8. Results will show data that ends in the number 9

Activity 6

1. You are sure that this word contains no spelling errors. It might be a name or a place
2. Headers and footers are useful to display information you wish to see on top or bottom of each page. (Do not except examples without explaining)
3. The F1 key gives access to online program help files.
4.
 - Between 18 AND 50Will only allow numbers from and including 18 up until 50.
 - ≤ 18 OR ≥ 50Will allow numbers from 18 downward or from 50 upward.
5. Validation text is used by the database designer to indicate an error if a validation rule has not been followed when entering data into a field in a table.
6. Required
7. A label
8. To combine data/results/text into a string.

Activity 7

1. To organize his customers data
To organize his suppliers data
2. To fast track the input of data in the table.
To help eliminate errors when data is captured.
- 3.1 Currency
- 3.2
 - Surname
 - Name
 - Age
 - Camp Fee**Reason:** None of these fields will require unique data
- 3.3 Short text
4. If you only select a field and its data, only that field and data would be sorted

and your records would not be correct.

5. A Column or bar chart
6. COUNTIF - Counts cells that meets required criteria
SUMIF - Sums cells if it meets certain criteria
7. =RANDBETWEEN(1,50)
8. <table bgcolor="blue" cellspacing="3" cellpadding="5" border="1">

Solutions Development Past Exam Papers Solutions

November 2012

7.1.1	<ul style="list-style-type: none">● Sort/filter the spreadsheet ✓● According to the class column ✓	2
7.1.2	<ul style="list-style-type: none">● Merge● Merge and Center● Merge Cells (Open Office) <p style="text-align: right;">✓(Any one)</p>	1
7.1.3	<ul style="list-style-type: none">● Multiply the answers by 24 (Accept correct conversions) ✓● Format the cells/field to Number ✓	2
7.1.4	<ul style="list-style-type: none">● Import● Copy and paste● Copy <p style="text-align: right;">✓(Any one)</p>	1
7.1.5	<ul style="list-style-type: none">● Column/bar chart ✓	1
7.2.1	<ul style="list-style-type: none">● Cell Number ✓● Each entry will be unique/prevents duplication of record ✓	2
7.2.2	<ul style="list-style-type: none">● Validation rule ✓	1
7.3.1	<ul style="list-style-type: none">● Query (or Report based on Query) ✓	1
7.3.2	<ul style="list-style-type: none">● Count function ✓● In the report footer ✓	
	(Note to marker: Do not accept a vague response such as 'use an appropriate function')	2
		[13]

November 2013

7.1	<ul style="list-style-type: none">● Spreadsheet - calculations/invoices/orders/statements of accounts, financial statements, etc.	2
-----	---	---

- Word processing application - correspondence, contracts, minutes of meetings etc.
- Database applications - employee data, stock data, suppliers'/debtors'/creditors' data, etc.
- E-mail software - communication
- Web browser software - Internet searches

(Note to marker: Marks are not allocated to the applications but to the use of the applications related to small businesses.)

✓✓(Any two)

- 7.2.1 • Formatting of cells set to Currency/Accounting format ✓ 1
- 7.2.2 • Remove decimal commas from cells B4:B6 ✓
- Replace decimals with points ✓

(Note to marker: Accept any response related to the fact that some computers may have been set up to accept a decimal comma so for example, an incorrect formula was used.) 2

- 7.2.3 • Insert border lines between the cells
- Make the headings bold/larger font/use appropriate font sizes
- Use highlighting/shading, etc.
- ✓(Any one) 1

[8]

November 2014

- 8.1.1 • Accept any version of HTML (XHTML, XHTML, HTML etc.) ✓ 1

- 8.1.2 • displays bulleted (unordered) list ✓
- displays a numbered (ordered) list ✓ 2

- 8.1.3 • Image is not in the specified folder
- Image extension is different from HTML code
- Spelling/Typing error
- Web browser cannot display the image type/format
- Incorrect tags used
- Image reference not present/correct, etc.
- ✓✓(Any two) 2

- 8.2.1 • *business*
- Use an asterisk ✓ on both sides ✓ of the word business

(Note to marker: Ignore if the LIKE operator has been added. Allocate one mark if the answer refers to wildcards only. Accept variations of the word business) 2

8.2.2	Easier for the data capturer/Shorter to type Fewer mistakes when entering data Easier to use in queries Use less storage space, etc.		
	(Note to marker: Do not accept easier/quicker to sort/store.)	✓✓(Any two)	2
8.3.1	<ul style="list-style-type: none"> ● Conditional formatting ✓ 		1
8.3.2	Incorrect relational operator, e.g. (>50) Including the value 50, e.g. (>=50) OR (>49) Criteria must appear in quotes/Inverted commas (">=50")	✓✓(Any two)	2
8.3.3	<ul style="list-style-type: none"> ● Text wrapping ✓ 		
	(Note to marker: Accept explanation of using Alt+Enter to start a new line within a cell.)		1
8.4	Allows/Facilitates editing of one document by multiple users Allows for original data/changes to be reviewed/viewed before being committed/Changes can be accepted or rejected It is possible to see which changes were made by which users, etc.		
	(Note to marker: Accept specific examples such as each person's editing appearing in a different colour or that the changes can be accepted or rejected one at a time.)	✓✓(Any two)	2
			[15]

November 2015

8.1.1	Table/Query in a database Spreadsheets/CSV (Comma delimited) file Contacts file e.g. in Microsoft Outlook Table in a word processing document Text files, etc.		
	(Note to marker: Do not accept reference to a word processing document without a table.)	✓✓(Any two)	2
8.1.2	<ul style="list-style-type: none"> ● To act as a placeholder for the merged data/To indicate where each data/field from the source should go/must be added ✓ during the merge process 		1

8.2.1	<ul style="list-style-type: none"> ● Must be 60 or older ✓ ● Must not be working ✓ 	
	(Note to marker: Do not accept 'older than 60' for the first mark.)	2
8.2.2	<ul style="list-style-type: none"> ● Blank cell ✓ 	
	(Note to marker: Accept 'nothing' as an answer. Do not accept if the answer is left blank, i.e. unanswered.)	1
8.3	<ul style="list-style-type: none"> ● Paste only characters with no formatting ● Paste as a hyperlink ● Paste as a lin ● To choose whether to use the source or destination formatting or not ● To leave out or skip blanks ● To transpose rows/columns ● Paste values and not functions /formulae, etc. 	
		✓(Any one) 1
8.4.1	<ul style="list-style-type: none"> ● To comment/document ✓ 	
	(Note to marker: Accept as an indication of where to put the data.)	1
8.4.2	<ul style="list-style-type: none"> ● None of the content within the HTML comment tag is displayed ✓ 	
	(Note to marker: Accept 'nothing' as an answer. Do not accept if the answer is left blank, i.e. unanswered.)	1
8.5	<ul style="list-style-type: none"> ● The text that is displayed if for any reason the image cannot be displayed ✓ 	1
8.6.1	The Stock ID field has already been set as the primary key ✓	1
8.6.2	Validation rule/Combo/List box/ Lookup table ✓	
	(Note to marker: Do not accept Input mask as an answer)	1
8.7.1	<ul style="list-style-type: none"> ● The criteria in each line is treated separately/as an OR option ✓ ● Place both the criteria in the same 'line' ✓ 	
	(Note to marker: Accept if the candidate draws a diagram correctly reflecting the solution.)	2
8.7.2	<ul style="list-style-type: none"> ● Description ✓ 	1
		[15]

November 2016

- 8.1.1 The lookup value is incorrect ✓ /B4 should be A4
The column index of the lookup table is incorrect, ✓ should be 2
(Note to marker: Accept either the identification of the problem or the correct answer.) 2
- 8.1.2 The error occurs because the formula tries to multiply a number by text (a word). ✓ 1
- 8.2
- COUNT counts cells that contains numerical values/numbers ✓
 - COUNTA counts cells that contain any value/that are not empty ✓ 2
- 8.3
- Formatting only gives the appearance of being rounded off, while the actual value is not changed/The ROUND function changes the actual value ✓ 1
- 8.4.1
- Styles ✓ 1
- 8.4.2
- Manage sources/Source manager/Sources ✓ 1
- 8.5
- Any text editor such as Notepad
 - Any HTML editor such as Notepad ++
 - Any word processor such as Microsoft Word
 - Coffee cup/Kompozer
 - MS Expression Web
 - Dreamweaver, etc.
- ✓(Any one) 1
- 8.6
- A web page is part of website/A website is a collection of web pages ✓ 1
- 8.7
- The text between title tags ✓ within the head section is indicated in the browser tab 1
- 8.8
- Not supposed to start with a closing tag
 - Not supposed to end with an opening ta
 - (The opining and closing) tags must match (either both ul or ol)
- (Note to marker: Accept any correct example of HTML code.)
- ✓✓(Any two) 2
- 8.9
- (More user-friendly way of) capturing of data/Designed for data capture
 - To display only one record at a time
 - To limit the fields displayed, etc.
- 1

✓(Any one)

- 8.10 ● It has no effect on the values in the database table/ The values in the database table remain the same ✓ 1

[15]

November 2017

- 8.1 ● To check/correct the text layout/formatting/non-printing characters of the document
● To check the number of spaces/tabs between words
● Checking for page/section breaks
● Checking for empty lines

✓(Any one) 1

- 8.2.1 ● 18.5 (cm) ✓

(Note to marker: Accept an answer from 18.3 to 18.7) 1

- 8.2.2 ● Merge cells
● Copy all text to one cell and delete unwanted column(s)

✓(Any one) 1

- 8.2.3 ● Add underlined words to dictionary
● Change the language of the spell checker
● Disable the spell checker

(Note to marker: Accept responses that refer to right click and selecting the correct option as well as selecting the "Ignore/Ignore all" option)

✓✓(Any two) 2

- 8.2.4 ● Use Autofit option
● Adjust width in table properties
● Manually drag column borders
● Change page orientation to landscape
● Change margins
● Change the page size

✓(Any one) 1

- 8.3.1 ● It will have no effect ✓ 1

- 8.3.2 ● The dimensions specified are not in keeping with the aspect ratio
● The balance between height and width is wrong

✓(Any one) 1

- 8.3.3 ● The blind user will not be able to understand what the picture is 2

- about ✓
 - There is no alt attribute (for screen reader) ✓
 - 8.4.1 • (Data) validation ✓ 1
 - 8.4.2 It indicates the use of a filter/Gives a list of options for items to display ✓ 1
 - 8.4.3 DO NOT MARK
 - 8.4.4 • Property ✓
 - Unique field/ No duplicate in this field ✓ 2
- [14]

November 2018

- 8.1 • Language is set to English (US)/The language is set incorrectly/Language not set to English(South Africa)
- The spell checker is disabled
- The US spelling of the words were added to the dictionary
- ✓(Any one) 1
- 8.2 • The data source file has been moved/deleted
- The linking to the data source was incorrectly done
- The data source file/document is corrupt
- ✓✓(Any two) 2

8.3

	FIELD NAME	DATA TYPE
E.g	<i>Name</i>	<i>Text</i>
• 8.3.1	ID Number	Short Text ✓
• 8.3.2	Date of Test	Date/Time ✓
• 8.3.3	Mark	Number ✓

3

- 8.4 • Lock/Protect the cells ✓ / Restrict editing 1
- 8.5 • Replace text in referenced cell(s) with a valid number ✓/Ensure that referenced cell(s) do not contain text
- Make reference to the correct cell ✓ 2
- 8.6 =VLOOKUP(A1,\$L\$1:\$M\$5,2,FALSE) 2

	<ul style="list-style-type: none"> Remove the inverted commas/quotes from cell A1 ✓ Apply absolute reference/F4 to cell range \$L\$1:\$M\$5 ✓ 	
8.7.1	<ul style="list-style-type: none"> Concatenate ✓/Concat/Textjoin 	1
8.7.2	<ul style="list-style-type: none"> Average ✓/Avg 	1
8.8.1	<ul style="list-style-type: none"> Creates a bookmark ✓ /anchor/target location on the same page 	1
8.8.2	<ul style="list-style-type: none"> Links to bookmark ✓/Target location created/Creates a hyperlink 	1
		[15]

November 2019

8.1	<ul style="list-style-type: none"> Can create an electronic table of content Document looks professional Can create hyperlinks to headings etc. 	✓(Any one)	1
8.2	<ul style="list-style-type: none"> Wish to change the page orientation of the document from certain point onward Changes to header or footer from certain point onward Changes to page margins from certain point onward 	✓✓(Any two)	2
8.3	<ul style="list-style-type: none"> Track changes ✓ Insert comment ✓ 		2
8.4.1	<ul style="list-style-type: none"> The Show/Hide is on ✓ 		1
8.4.2	<ul style="list-style-type: none"> A line break ✓ was inserted 		1
8.5	<ul style="list-style-type: none"> View Page break preview and Move the page break preview lines to the suitable column and row ✓ 		1
8.6	<ul style="list-style-type: none"> The (!) indicates the specific sheet's name that will be used - data! sheet ✓ 		1
8.7	<ul style="list-style-type: none"> General number ✓ 		1
8.8	<ul style="list-style-type: none"> \$A2 Only the column should be an absolute ✓ \$E\$1 The column and the row should be absolute ✓ 		2
8.9	<ul style="list-style-type: none"> Square brackets references the field names inside the table that 		1

should be used in the calculation ✓

8.10 ● The total number of records over the whole report would be counted ✓ 1

8.11 ● The <title> tag should be move to the front of December holidays ✓ 1

[15]