

Candidate's Name: **MARKING GUIDE**

Answers in Blue

.....

Signature:

Random No.					Personal No.		

(Do not write your school / Centre Name or Number anywhere on this booklet.)

S850/1
Subsidiary Information
and Communication
Technology
Paper 1
Jul./Aug. 2017
2½ hours

UGANDA NATIONAL EXTERNAL MOCK EXAMINATIONS

Uganda Advanced Certificate of Education

SUBSIDIARY ICT

Paper 1

2 hours 30 minutes

INSTRUCTIONS TO CANDIDATES:

*Answer **all** questions in this paper.*

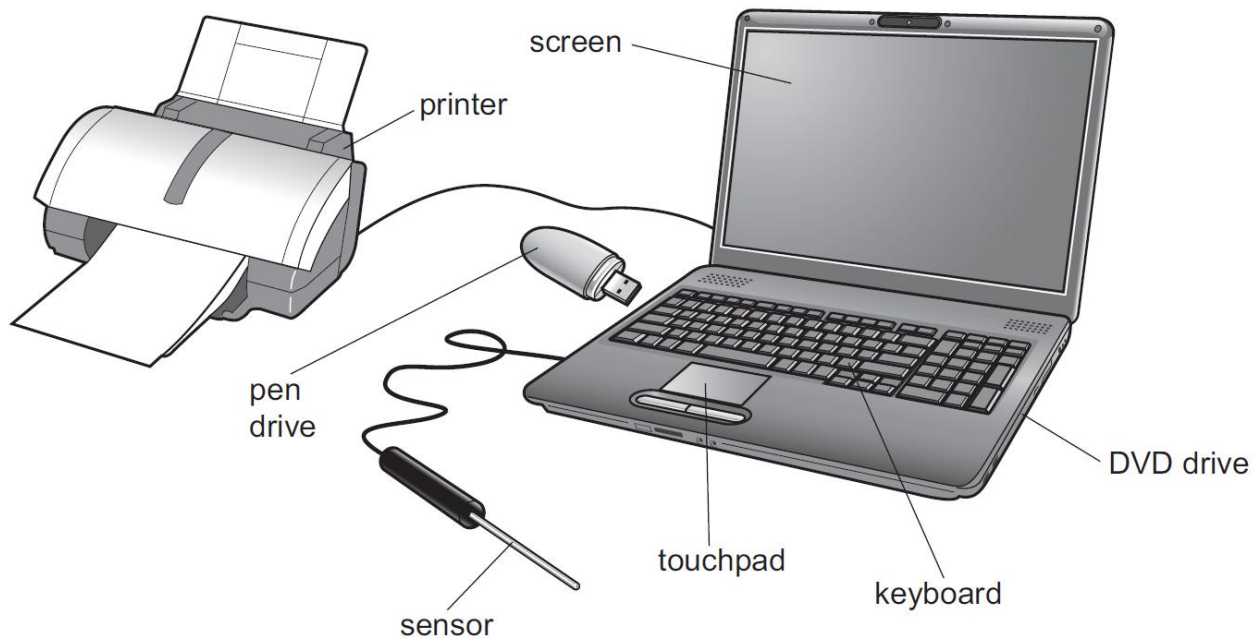
*This paper is made up of **twenty** equally weighted questions.*

All answers should be written in blue or black ink in the spaces provided on the question paper.

For Examiners' Use only																				
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total

*Answer **all** questions in this paper.*

1. This diagram shows a laptop computer being used in a measuring experiment.



(a) Name **three** input devices shown in the diagram above. (3 marks)

- Sensor
- Touchpad
- Keyboard

(b) Name **two** storage devices shown in the diagram above. (2 marks)

- Pen drive
- DVD drive

2. Define the following terminologies in relation computer software. (5 marks)

(a). Firmware

- Permanently written data, instructions, or programs written to a ROM chip with in a device by its manufacturers.

(b). Shareware

- Software that is available free of charge and often distributed informally for evaluation, after which a fee may be requested for continued use.

(c). Freeware

- Freeware is copyrighted software provided at no cost for use. Because it may be copyrighted, you may not be able to modify / reuse it in programs you are developing.

(d). Adware

- Adware is software that automatically displays or downloads advertising material (often unwanted) when a user is online.

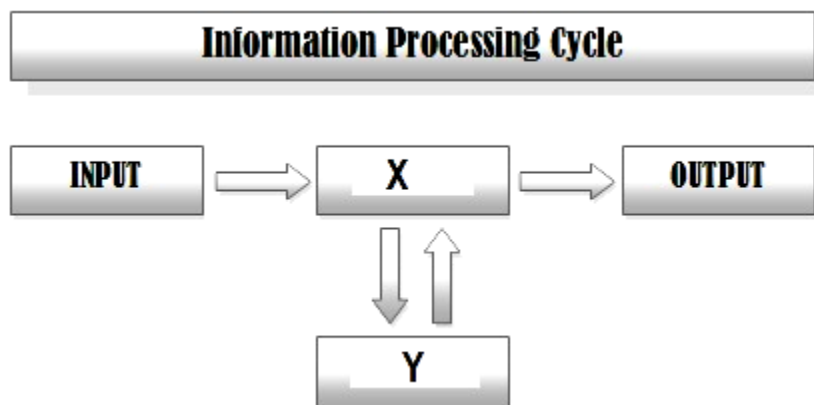
(e). Spyware

- Software that enables a hacker to obtain private information about another's computer activities by transmitting data stealthily from their computer.

3 (a). Tick (✓) the correct box below to show whether each of the following is data, information or knowledge. (3 marks)

	Data	Information	Knowledge
The school quiz team with 45 points had the highest points of the day and were the winners	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
45, 44, 27, 17, 7	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
45 points, 44 points, 27 points, 17 points, 7 points	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

(b) Identify the stages labeled X and Y in the figure below to complete the information processing cycle. (2 marks)



X: Processing

Y: Storage

4. Draw **five** lines below to match the software to how it could be used. (5 marks)

Software	Possible Use
Desktop publisher	suggesting medical diagnoses
CAD program	storing pupil records in a school
Spreadsheet	producing a school magazine
Inference engine	preparation of blueprints and other engineering plans.
Database	managing personal finance

5. A hairdresser uses a relational database to keep records of his clients and their appointments. The hairdresser uses an off-the-shelf DBMS to set up the structure of the database, add data and manage the database.

(a) State what is meant by **off-the-shelf DBMS**. (2 marks)

- This refers to packaged Database Management Software (DBMS), such as Microsoft Access, that is designed to meet the needs of a wide variety of end users.
- Off the shelf software is mass-produced, commercially sold software, and copyrighted. Database Management Software is used to create and manage an organized collection of related and structured information (a database).

(b) State **three** tasks the hairdresser can perform using the DBMS, once the database is in use.

Database setup tasks: (3 marks)

- Create tables / entities
- Define fields / attributes / columns
- Define (primary) keys
- Define relationships / links between tables / foreign keys
- Set the constraints on the data /validation rules / data types / field lengths / other suitable example
- Create database forms

Database usage tasks:

- Add client/appointment data
- Edit client/appointment data
- Delete client/appointment data
- Run/Create/View reports using a relevant example of a report that would be needed e.g. today's appointments
- Search/query for data using a relevant e.g. search for a client's phone number
- Back up (client/appointment) data.
- Archive (client/appointment) data/ example of archiving

6. Computer maintenance is the practice of keeping computers in a good state of operation and performance. A number of routine maintenance activities are carried out on specific components of the computer system. Briefly mention one activity carried out on each of the following during computer maintenance:

(a) Keyboard (1 mark)

- The crumbs, dust, and other particulate that fall between the keys and build up underneath are loosened by spraying pressurized air into the keyboard, then removed with a low-pressure vacuum cleaner.
- A cleaning agent applied to the surface of the keys with a cloth is used to remove the accumulation of oil and dirt from repeated contact with a user's fingertips.

- If this is not sufficient for a more severely dirty keyboard, keys are physically removed for more focused individual cleaning, or for better access to the area beneath. Finally, the surface is wiped with a disinfectant.

(b) Monitor (1 mark)

- Fingerprints, water spots, and dust are removed from the screen with a cleaning wipe specialized for the screen type (CRT, LCD, etc.).
- A general plastic-cleaning agent is used on the outer casing.

(c) Hard disk (1 mark)

- Disk checking: Windows has a program called chkdsk.exe (for check disk), which examines the hard drive's file system for integrity and logical errors and can fix them.
- Disk Cleanup: Disk cleanup programs allow remove excess program files, internet downloads and other temporary unwanted files that taking up valuable space.
- Disk Defragmentation: Over time your hard drive becomes more and more fragmented. Doing Disk defragmentation consolidates all split files for better performance.
- Disk backup. Backing up basically means to create an extra redundant copy of data on the disk so that in case anything should happen to the original data, you have a spare copy.

(d) Tower/system unit (1 mark)

- The case is opened to expose the internal components, which accumulate dust brought in by the airflow maintained by fans to keep the PC from overheating.
- A soft brush is used throughout the case and components to remove as much loose dirt as possible; the remainder is dislodged with compressed air and removed with a low-pressure vacuum.
- You can also use pressurize blower or air blower that can easily remove all dust that cannot be reached with a brush.

(e) Operating System and Software (1 mark)

- Operating-system files such as the Windows registry may require maintenance. A utility such as a registry cleaner may be used for this.
- Software updates: Software packages and operating systems may require regular updates to correct software bugs and to address security weaknesses.

7. Tick (✓) to identify the type of network used in each situation below. (5 marks)

Situation	LAN	WAN	PAN	MAN	VPN
A delivery driver uses a hands-free car kit to connect to his mobile phone.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A dental nurse uses a computer to look at digital x-rays stored on a server in the basement of the building.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

A manager, working from home, is able to privately access all the computers in his company as if he was in the company office.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Kampala City Council Authority providing internet connectivity for the entire city.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
An office in Tokyo sends emails to all customers, whether they are in New York, Paris or Delhi.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

8. (a) Apart from Microsoft (Office) Excel, identify any **three** other examples of the popularly used spreadsheet software. (3 marks)

- Microsoft Excel, Lotus 1-2-3, K-Spread, Apple Numbers, Quattro Pro, OpenOffice.org Calc, Kingsoft Spreadsheets, Ability Spreadsheet, etc

- (b) A head teacher wants to store details of his students' attendances in a spreadsheet. He has typed in the details of two students so far. Each student is identified by a student ID which consists of one letter followed by 6 digits. The number of possible attendances is recorded along with each student's actual number of attendances.

	A	B	C	D	E
1	Student name	Student ID	Possible attendances	Actual attendances	Percentage attendance
2					
3	Maria Gonzales	L543789	80	72	
4	Clive Ssekitto	M351209	80	66	
5					
6					

- (i) He wants the spreadsheet to perform a calculation of the percentage attendance of Maria Gonzales in E3. Explain how he would use the spreadsheet to do this.

(1 mark)

- In E3, Type $=D3/C3 * 100$
OR
- Type in $=D3/C3$ in E3 and Set the format to %

- (ii) He now wants to add another 18 students to the spreadsheet. Explain how he could calculate the percentage attendance for each student by only using a computer mouse. (1 mark)

- Click on E3, manoeuvre to bottom right hand corner of cell until black cross appears, click and drag the black cross down to E22
- Right click on E3, Select copy from menu, Select E4 to E22, Right click and click on paste.

9. (a) What is the importance of a **protocol** during data communications? (1 mark)

- To allow connected machines to communicate
- To provide the rules of communication between two networked devices.

(b) Differentiate between **encoding** and **encryption** as used in data transmission:

(2 marks)

- Encoding is the process through which Information (e.g. data, text, voice or video) from the sending device is converted into signals which the communication medium can carry.

While

- Encryption is the process of converting data into cypher text form to prevent it from being read or understood by unauthorized people.

(c) Apart from a protocol, list **two** other elements of data communication. (2 marks)

- The five elements of data communication are **message, sender, receiver, transmission media** and protocol.
 - **Message:** is the information or data to be communicated. It consists of text, numbers, pictures, sound or video.
 - **Sender:** is the device that sends the data message. It can be a computer, workstation (node), telephone handset, video camera. Etc.
 - **Receiver:** it is the device that receives the message. It can be a computer, workstation, telephone handset, television etc.
 - **Transmission medium:** is the physical pathway by which a message travels from sender to receiver. Some example of transmission media includes twisted-pair wire, coaxial cables, fiber-optic cable, and radio waves.
 - **Protocol:** A protocol is a set of rules that govern data communication. It represents an agreement between the communicating devices. Without a protocol, two devices will be connected but no communication is made.

10. (a) Mention any **two** ways in which you will use the subsidiary ICT knowledge and skills you've acquired to earn income during your vacation. (2 marks)

- Typesetting documents and printing business
- Taking on Data Entry jobs
- CD/ DVD writing and selling
- Provision of internet services
- Networking computers for organizations
- Desktop Publishing

- Computer Software Installation
- Computer Hardware Maintenance
- Image editing and graphic design
- Web page or website development
- Blogging
- Social Media marketing
- Computer Training

(b) List any **three** professional careers in the ICT Industry.

(3 marks)

Computer professions / Careers in the ICT industry include:

- **Webmasters / Web developers:** Webmasters design, develop and maintain web sites and web systems.
- **Computer Trainers:** Computer trainers typically teach new users how to use the computer software and hardware.
- **System administrators:** A system administrator, or sysadmin, is a person who is responsible for the upkeep, configuration, and reliable operation of computer systems; especially multi-user computers, such as servers.
- **Computer support specialists:** Computer support specialists provide technical help / advice to customers and other users.
- **Computer technicians:** Computer technicians repair and install computer components and systems.
- **Data entrants:** Data entrants input customer information, lists, and other type of data. Input devices are typically limited to keyboards, mice, and scanners. Because the accuracy of recorded data is so important, data entry workers are often required to verify the accuracy of data they and others have entered.
- **Technical writers:** Technical writers prepare instructional manuals, technical reports, and other scientific or technical documents. Most Technical writers work for software firms, government agencies, and research institutions.
- **Software engineers:** Most Software engineers analyses user needs and create application software. Software engineers usually have experience in programming, but focus on the design and development of programs using the principles of mathematics and engineering.
- **Network administrator:** Network administrator manages a company's LAN and WAN networks. They may be responsible for the design, implementation and maintenance of networks.
- **Database administrators:** Database administrators use database management software to determine the most efficient ways to organize and access a company's data.
- **Computer programmers:** Computer programmers create, test, and troubleshoot programs used by computers. Programmers may also update and repair existing programs.
- **Graphic designers:** A graphic designer is a professional within the graphic design and graphic arts industry who assembles together images, typography, or motion graphics to create a piece of design.

11. The World Wide Web has greatly evolved and it consists of different types of websites, including blogs and wikis. Tabulate **three** differences between blogs and wikis. (3 marks)

Blog	Wiki
1 Blog usually has a single author	1 a Wiki usually has many authors
2 Blog is usually in reverse chronological structure	2 a Wiki has a structure determined by content and users
3 Blog is usually personal/someone's opinion	3 a Wiki is usually objective
4 The public can't edit someone's blog, can only add comments to a blog.	4 a Wiki can be edited by the public users.

(b) Describe **two** ways to evaluate the reliability of information found on a website.

(2 marks)

- Check the last part of the URL. The top level domain can help to identify reliability (for example .gov, .ac, .ed, .sch are usually fairly reliable, while.org, .co, .com are less reliable).
- See if responsible bodies have endorsed the site e.g. NGFL. If site is endorsed by reliable/reputable people/organizations it can be accepted as being reliable.
- Check the date of the last update. If the date of the last update was a long time ago it is likely to be unreliable.
- Are any advertisements present? If site has excessive advertising it could be unreliable. If the advertising is related only to its own products it could be unreliable.
- Are there links to and from the website to and from well-known reliable websites? If it has links to other reliable sites it is usually reliable
- Checking the author's credentials. If the author's credentials are good it is likely to be reliable.
- Can compare information from sites to see if it is reliable. If information is comparable to information from reliable/authenticated/text books it is likely to be reliable.
- If it has testimonials it is likely to be reliable.

12. Complete the table by identifying the most appropriate type of printer for each case of output below. (5 marks)

Output	Printer Type
Produces very high quality printing where speed is not an issue	Inkjet printer
Production of continuous stationery where noise is not an issue	Dot matrix printer
Produces rapid, high quality and high volume printing	Laser printer
Produces very large printouts such as size A0	Graph plotter
Receives data from computer devices and embosses that information onto thick paper used by blind people.	Braile Printer

13. (a) Draw a line to link each element of a graphical user interface to its use. The first has been drawn for you. (3 marks)

Element	Use
Window	to click on to open an application
Icon	to display a set of choices to the user
Menu	to select an item on a screen
Pointer	to display tasks being worked on

(c) (i) What is the importance of creating shortcut icons when using a computer? (1 mark)

- Shortcuts are small files that point to other files or programs. Instead of duplicating a file in multiple places where it may be needed, one copy of the file can be kept in a centralized location and several shortcuts created in several places can point to it. Double clicking on a shortcut is the same as double clicking on the target file/folder.
- They provide quick access to items even if they are far way – on a hard disk directory subfolder, on a network drive in another office or on a notebook PC that could be anywhere.
- They provide an easy way to launch programs, open folders, review documents, check printer operations and do countless other tasks by pressing a combination of keys.

(ii) Which of the following icons is a shortcut icon? (1 mark)



Icon A



Icon B

10



Icon C



Icon D

- Icon D

14. Match the following file extensions to their corresponding file types: (5 marks)


.doc		A spreadsheet file
.xls		A temporary file created by the system
.tmp		A word processing file
.bmp		A database file
.mdb		An image file

15. The poster below was created using desktop publishing software (DTP) to advertise a school's outdoor pursuits trip.


OUTDOOR PURSUITS TRIP

JULY 22ND 2015

£125 PER STUDENT



- Kayaking
- Rock climbing
- Coasteering
- Orienteering



(a) Briefly explain what you understand by **Desktop Publishing** (DTP). (1 mark)

- Desktop publishing refers to the use of a personal computer to create print publication documents with the aid of and a WYSIWYG page layout software. Desktop publishing methods provide more control over design, layout, and typography than word processing does.
- Desktop Publishing enables professional designers to create sophisticated documents that contain colorful text and graphical designs, during the production of high quality documents such as business cards, certificates, fliers, text books, corporate newsletters, marketing literature (adverts), product catalogues and annual reports, etc.

(b) Name **four** DTP features that have been used to create the poster above. (4 marks)

- Word Art 3D/Shadow
- ClipArt / picture / image/ graphic
- Bold Font (NOT bold or font by itself) Accept Bold text/bold letters
- Italic Font / Italic text (BUT NOT text by itself, NOT italic by itself) Different font styles / font styles (Not different fonts/Not font types)
- Centre text
- Font size / text size Bullet points AutoShape
- Coloured background/shading Text box/border
- Overlay Tabs/Tab stops
- Superscript

16. A laptop computer is supplied with a 5GHz dual-core central processing unit (CPU) and 8 gigabytes of RAM.



(a) Give a reason why a computer with 8 gigabytes of RAM could run several large programs faster than a computer with 2 gigabytes of RAM. (1 mark)

Because:

- A computer uses RAM to store programs (and data) while they are being executed. The more the RAM the more working memory available, the faster.
- All the programs might fit in RAM.
- And not have to be read in and out to/from disc.

(b) Describe what is meant by the term 5GHz. (1 mark)

- 5GHz means (5 billion or 5 000 000 000) cycles per second

- This is the clock speed of the processor.
- (c) Describe what is meant by a dual-core CPU. State a possible benefit of its use. (1 mark)
- A dual-core CPU has two processors / carry out two instructions at the same time.
 - Its benefit is that the computer could run programs faster than one with a single processor.
- (d) Apart from dual-core, state **two** other types of CPUs available today. (2 marks)
- Processors by Intel include Pentium I, Pentium II, Pentium III, Pentium IV, Pentium Duo core, Core 2 Duo, Core 2 Quad, Atom, Celeron, Centrino, Intel CORE i3, Intel CORE i5, Intel CORE i7,
 - Processors by AMD include: Xeon, Opteron, Athlon, Itanium, Phenom, Sempron, Turion II, Athlon II, Phenom II, A-Series (Fusion), FX
etc

17. An office has a fast Internet connection for transferring information. However employees sometimes complain that the Internet is running slowly.

- (a) Give **two** reasons why this could be the case. (2 marks)

- Issues with Wi-Fi/Internet connection
- Connection from ISP not working at expected speed
- User/other employees downloading/uploading/transferring large/several files
- Many employees accessing at the same time
- Problems with router
- Virus affecting internet connection/system
- Computer software may need updating
- Browser add-ons may be affecting the speed

- (b) Mention **three** internet services the staff need to simply office work. (3 marks)

- Telnet – enables users to use the resources of a computer in another part of the world. This is done by remotely logging to the distant computer which is called the host.
- Email – It allows the transfer of messages, documents, and pictures among others, across the Internet.
- Mailing list – This is based on the email protocol. As an electronic mailing list it is very convenient when somebody wants to send a message or newsletter, for example, to many people in one go.
- Internet Relay Chat (IRC) – A live interactive discussion in which parties on the network exchange ideas and observation electronically. Chats are usually organized in what we call chat rooms.

- File Transfer Protocol – The standard method for transferring files, whether downloading or uploading, to and from your computer with another computer on the Internet.
- Newsgroups – Worldwide discussion areas where notices can be posted for anyone to view. They are equivalent to a discussion group or an electronic bulletin board. There are newsgroups for every conceivable topic and more, e.g. educational technology.
- World Wide Web – This refers to the global collection of linked electronic documents called Webpages stored on internet servers all over the world. The www is the most exciting service that has revolutionized the Internet, people use this service to browse for information.
- Instant Messaging: A combination of real-time chat and e-mail by which short text messages are rapidly exchanged over the Internet, with messages appearing on recipient's display screen immediately upon arrival.
- Usenet or User's Network: A system of worldwide discussion groups, not an actual physical network. Netiquette: A list of simple newsgroup guidelines that keep people from making mistakes.
- Internet Telephony or Voice over the Internet or Voice over IP: Real-time voice conversations transmitted between computers on the Internet.
- Web Directory: A listing of Web sites and their URLs, categorized by topic.
- Electronic Commerce/e-commerce: Conducting commercial activities on the Internet.
- Social Networking. A type of service where users can seek others who share their interests, find out what's going on in their areas of concern, and share information with one another (e.g. Facebook, Twitter).
- Cloud Computing: A service in which computer software, hardware and data are accessed from anywhere and used remotely over the Internet, instead of acquiring and using them on a local computer.
- Search Engines: Software programs that look through the Web to locate sites matching a keyword entered by the user. Keyword: A string of letters or words that indicates the subject to be searched.

18. (a) Explain how **artificial intelligence** relates to **robotics**. (1 mark)

- Robots are machines that use artificial intelligence to do jobs that humans would do.
- Artificial intelligence is a branch of computer science that tries to make software imitate human intelligence. Artificial intelligence is based on getting machines to behave like humans.

(b) Give **two** advantages to a business of using robots instead of human workers. (2 marks)

- Robots can work 24 hours without breaks/getting tired
- Robots don't need to be paid wages
- Robots don't go on strike/fall sick
- Reduction in accidents involving humans
- Increased productivity
- Avoids human error
- Consistency of performance

(b) To handle goods in a warehouse, an online retail business is switching to using computer-controlled robots instead of using human workers. Give **two** ways how this would affect the local community? (2 marks)

- Unemployment//redundancy//financial/family problems
- Local businesses/economy affected
- Possible increase in crime (Idle youth)
- People leaving community (to find other work)
- Opportunities for high skilled/programming jobs

19. A large comprehensive school has over 500 computers connected to their Local Area Network (LAN) with a connection to the Internet.

(a) Describe **three** disadvantages for the school of having a network of computers compared to stand alone computers. (3 marks)

- A network manager / administrator may need to be employed, which might be expensive
- Could be infected with a virus, that could spread to all other computers
- Security problems: receives traffic from other networks
- Hackers may gain access, as network only as secure as weakest point of entry to data and steal/destroy
- The server / switch could go down (main cable break) so all workstations on the network are affected
- Can be expensive to set up - as Initial cost of servers, communication devices, switches, network software etc is high.
- Substantial Initial disruption - drilling holes, fitting trunking, running cables between buildings etc...
- Can have a slow response time - due to heavy network traffic - so users cannot work as effectively
- Detecting network problems can be more difficult on a network - difficult to isolate

- Time and effort to set up users and access configurations- can just start a standalone and use computer

(b) All staff and pupils have a unique username and a password to access the network. State **two** rules that should apply to users' passwords to reduce the possibility of someone guessing a password. (2 marks)

- Passwords must contain numeric and not numeric characters
- Passwords must contain upper case and lower case characters
- Passwords must contain non-alphanumeric characters
- Passwords must be a minimum length
- Passwords must not be written down or divulged to anyone else
- Passwords must be changed regularly
- Not re-use password
- Not containing obvious guessable things such as name or DOB
- Not be recognisable series of characters such as 1234 or ABCD or QWERTY
- Passwords can be randomly generated.

20. Security on a computer system can be provided directly by the operating system or by using utility programs.

(a) Utility programs include antivirus, file transfer, firewall and system cleanup.

(i) Identify which **two** of these utilities can be used for security. (2 marks)

- antivirus
- firewall

(ii) Describe how the utilities identified in (a) (i) provide security to the computer system. (2 marks)

- Antivirus utilities are programs that scan for computer viruses, remove, disinfect and repair damaged files.
- A utility that detects and protects a personal computer from unauthorized intrusions. The firewall uses rules to filter inbound traffic into the computer, to protect it from malevolent hackers.

(b) Identify and describe **one** other method by which the operating system can provide additional security directly. (1 mark)

- (User name and) password - Only allows you to use the system if you are authorized.
- Encryption - Prevents hackers from understanding any data if accessed (e.g. passwords).
- Access rights - To prevent files from being modified/deleted.
- User access control - Prevents users from making changes to the system.