0417 Past Papers

ICT

Chapter 4

Networks and the effects of using them

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8   A company has an extranet.

Explain what is meant by an extranet.

....

Three from:
Extranet is a network controlled by a company
Restricted/private network
Allows access for partners/vendors/suppliers
Allows access for authorised customers

.... [3]

10 A headteacher is planning to hold a video-conference with headteachers from other schools.

The headteachers already have basic internet connected desktop computer systems including a monitor, keyboard and mouse.

(a) Identify **three** pieces of additional hardware they need in order to participate in a video-conference.

1 ....

2 ....

3 ....

10(a)	Microphone
	Video camera/webcam
	Speakers/headphones

[3]

(b) A technician is setting up the hardware for the video-conference.

State **three** tasks the technician would need to do to set up the hardware for the video-conference.

You can assume that the hardware required has already been purchased.

1 ....

10(b)	**Three** from:
	Ensure the video camera/webcam, microphone, speakers/headphones are switched on
	Ensure the hardware devices are connected
	Carry out tests on the microphone, video camera/webcam and speakers/ headphones
	Adjust the video camera/webcam so the headteacher can be seen
	Check the volume levels
	Check internet connectivity

2 ....

3 ....

[3]

14 Compare the similarities and differences between Bluetooth and wi-fi.

14	Max **three** from:
	Similiarities Both use wireless communications Both use radio frequencies for communication Both allow several devices to be connected Both use security when sending data Max **three** from: *Differences* wi-fi has a faster data transfer rate wi-fi has a greater range of transmission wi-fi uses key matching encryption Bluetooth uses WEP and WPA security together wi-fi can be broadcast wi-fi connects more devices Bluetooth has a lower frequency than wi-fi

[4]

(d) The data stored on the computer system needs to be protected from unauthorised access.

Discuss the effectiveness of different methods of increasing security of this data.

7(d)	**Eight** from:
	Factors increasing effectiveness
	Strong passwords are difficult to crack
	Biometric passwords are harder to crack
	Regularly changing passwords increases security
	Use of two-factor authentication
	Using different passwords for parts of the computer system makes it more difficult to gain access to the full system
	Firewall required to stop attacks from computers
	Firewall stops fraudulent sites attacking the computer
	Anti-spyware stops passwords being seen when typed in
	Factors reducing effectiveness
	Too complex a password can be easily forgotten
	Passworded files may not be backed up
	Using a number of different passwords can become cumbersome
	Regularly changing passwords means that passwords may be forgotten
	May be difficult to choose unique password if it is changed every few weeks
	Passwords may become more easy to guess if regularly changed
	Hackers can breach most passwords
	The firewall can affect the operation of the computer and stop some uploads
	The firewall may need to be shut down at times to upload files therefore making computer unsafe
	Some legitimate software can be blocked by the firewall
	To gain full marks both sides of the discussion are needed

[8]

8 Compare and contrast the features of a switch and a hub.

....

8	**Six** from: **Comparison** Both are network devices Both are hardware devices Both have computers and devices connected to them Both send data to devices//Both are communication devices **Contrast** In a hub data packets/data are broadcast to every device connected to it A hub is less secure than a switch in distributing data Switch checks the data packet Switch sends to an appropriate device To **gain full marks** both **contrast** and **comparison** is **needed**

....

....

....Artivate [6]

4 Complete the sentences below using the most appropriate word from the list.

cookies	hacking	pharming	phishing
smishing	spam	spyware	virus

(a) The act of gaining unauthorised access to a computer system is called

.... [1]

(b) The software that gathers data by monitoring key presses on a user's keyboard is called

.... [1]

(c) A fake text message, that could contain a link, sent to a mobile phone is called

.... [1]

4(a)	Hacking
4(b)	Spyware
4(c)	Smishing

9 (a) Describe **two** uses of a company intranet.

1..

9(a)	**Two** from: Send/receiving emails Send/receive attachments/files Internal file transfer within the company Allows the creation of extranets Surf internal information/webpages Sharing/use of applications/resources

2..

....

[2]

(b) Social networking is used to communicate with friends; this is one use of the internet.

Describe **four** other uses of the internet.

1..

9(b)	**Four** from, with descriptions: Email Use of the web Newsgroups Online chat Streaming Internet telephone Online conferencing Gaming File transfer

2..

....

3..

....

4..

....

[4]

(c) A major part of the everyday use of the internet is social networking. Currently some social networks are not policed. The owners of a website have full discretion on what material is removed and what is allowed to be kept.

Discuss the benefits and drawbacks of policing social networking sites.

Benefits
Max **four**:
Can reduce cyber bullying/hate speech/sexual harassment
Can reduce social media from being used for illegal activities
Can reduce the ability to incite violence/trolling
Could prevent people from being subjected to inappropriate messages
Can reduce illegal/inappropriate images

Drawbacks
Freedom of speech is reduced
Would be very difficult to police as there is a massive amount of information
Different rules in different countries and social media crosses borders
Very costly to create an effective deterrent
Could force individuals to use other un-policed methods of communication
Who decides what is acceptable and what is not acceptable
Privacy issues as people checking could read messages
Difficult to police as users can be anonymous

To gain full marks there needs to be benefits and drawbacks

[8]

7   A family has purchased a wireless router for use in their home to allow their devices to be connected via WiFi to form a wireless local area network (WLAN).

(a) When the family purchased the wireless router they were advised to change the default password.

Explain why they should change the default password.

7(a)	**Two** from:
	So that other people cannot access the router using the known default password
	As it is wireless the password could be cracked from outside easily and then used for free by others
	So that people cannot make changes to/access personal data on the router
	It would increase security of the data

[2]

(b) Describe the process of using WiFi to connect to a WLAN.

Four from:
The computer/device sends data to its wireless adapter
The data is converted into radio waves
The radio waves are transmitted
A wireless adapter receives the radio waves
Radio waves are converted into data
The computer initiates a handshake with the wireless router
The wireless router responds
Establishes a session/pairing
Wireless router checks the password/key is correct
Data is transmitted
User has to enter a password/passkey/automatic entry of key for known connections

[4]

(c) Their son produces large complex diagrams on his desktop computer at home. He needs to be able to access the diagrams when he is at university. Even if reduced in file size, the diagrams would be too large to send using email.

Describe in detail how he could transfer the diagrams from his home desktop computer to be able to access them at university, without using additional hardware.

....

....

7(c)	**Four** from:
	Create a cloud storage account
	Ensure sufficient storage in the cloud account
	Log into the cloud at home
	Upload/transfer the diagrams from his home computer to the cloud
	At university: access/login to his cloud storage account
	At university: download/access the stored diagrams

....

.... [4]

(d) One of the parents in the family works for a government department and sends sensitive data from their home computer to the office. The data is encrypted before being sent to ensure it is harder to understand if it is intercepted.

Describe **four** other preventative measures that could be taken to avoid network security issues.

1...

7(d)	**Four** from:
	Install security devices/firewalls
	Use a VPN
	Install security software/anti-virus/anti-spyware
	Set up security settings in the router/operating system
	Data backup in case of data loss/corruption
	Restrict access to the network infrastructure
	Train the family in the safe and secure use of the equipment
	Not opening emails/attachments from unknowns/phishing emails
	Not downloading files from unknowns/phishing emails
	Use a dongle to restrict use of software

4...

.... [4]

7   Bluetooth is a method of communication to connect devices together.

Describe how a smartphone can use Bluetooth to connect to another device.

7	**Four** from: Smartphone sends data to its Bluetooth connector Data is converted to radio waves The smartphone automatically detects nearby devices The smartphone pairs to the other device if in range The smartphone randomly chooses one of 79 possible channels If the channel is in use, it randomly chooses another The connection changes channels, every few seconds Sends the radio wave to the other device

.... [4]

8   An organisation uses the internet and an intranet.

(a) Explain how the purpose of the internet differs from the purpose of an intranet.

....

8(a)	**Four** from: Internet is used to share and distribute information outside the organisation whereas the intranet within an organisation Internet is used to send and receive emails and messages outside the organisation whereas intranet sends and receives messages within an organisation The intranet meets the needs of the organisation whereas internet aims to meet the needs of everybody The internet facilitates collaboration with others whereas the intranet is only used to collaborate with other members within an organisation The internet is used to browse the World Wide Web

[4]

Employees in the organisation are allowed to access the intranet using their smartphones.

The employees are required to secure their smartphones using either facial recognition, passwords or voice recognition.

(b) Tick (✓) whether the following statements refer to **facial recognition**, **password** or **voice recognition**.

	Facial recognition (✓)	Password (✓)	Voice recognition (✓)
This method cannot access the smartphone unintentionally			
The accuracy of this method can be affected by noise			
This method requires the use of the smartphone's camera			
This method could be compromised by shoulder surfing			

[4]

	Facial recognition	Password	Voice Recognition
This method cannot access the smartphone unintentionally		✓	
The accuracy of this method can be affected by noise			✓
This method requires the use of the smartphone's camera	✓		
This method could be compromised by shoulder surfing		✓	

11 Many young people play online games. One problem with online gaming is that it is easy to give out personal details accidentally. Some users create weak passwords which could lead to their personal details being accessed.

(a) Name **two** pieces of personal data that could be accessed.

1 ....

....

2 ....

....

11(a)	**Two** from for example:
	Email address
	Real names
	DOB
	Home address
	Contact phone number
	Membership card number
	Location data
	Internet Protocol (IP) address
	Picture of yourself
	Gender

[2]

(b) Write down **three** rules that should be applied when setting a strong password.

....

11(b)	**Two** from:
	Password should not relate to personal details
	Should be a long password
	Not previously used password
	Should not include repeating/obvious patterns//predictable words
	Password should be strong

[3]

(c) Describe safety measures that should be taken by gamers to ensure their data is safe other than using strong passwords.

11(c)	**Six** from:
	Use anti-spyware/up to date antivirus software
	Play the games with the firewall operational
	Play only with authorised versions of games which you have purchased from the correct sources and for which you have a licence
	Download/buy files and new software from reputable sources
	Do not forget to delete your account details when you are not playing again
	Keep the game software up to date.
	When disposing of your gaming device ensure all of your personal information has been deleted.
	Choose a username that does not reveal any personal information
	Be aware of criminals buying or selling 'property' that exists inside a computer game, in the real world

[6]

4 Write down the most appropriate network device to match the following statements. Your answers should be different in each part.

(a) This network device checks the data packet arriving from one computer and sends the data to a specific computer.

.... [1]

(b) This network device sends the data packet from a computer to all devices connected to it.

.... [1]

(c) This network device connects a LAN to the internet.

.... [1]

(d) This network device connects one LAN to another with the same protocol.

.... [1]

Question	
4(a)	Switch
4(b)	Hub
4(c)	Router
4(d)	Bridge

5   The Internet of Things (IoT) is a computer network which allows users to control household devices remotely. It has many benefits, for example a user can turn on the house central heating via a smartphone. The IoT can use WiFi and Bluetooth which can cause problems regarding data security.

Describe the methods that could be taken to protect the user's data.

....

Question	Answer
5	**Six** from: Change default name/usernames and passwords on the router Change the default privacy//use a strong privacy setting Disable features not in use Use strong WiFi encryption Separate the IoT from the home WiFi account Keep software/hardware up to date Avoid public WiFi networks Ensure firewall is operational Use anti-spyware/up to date anti-virus Use strong passwords Use unique passwords for each device Change passwords regularly

....Activate Window
Go to Settings to acti
9 in   .... [6]

5   Keeping data secure is very important in any computer system. Many organisations use encryption when sending data.

(a) Describe the term encryption.

....

5(a)	**Four** from:
	Scrambling of data
	Changes the data into a form that is not understandable
	Requires a decryption key/encryption key to decode
	Encrypted using a encryption key/code
	Changes plain text into cypher text

....

.... [4]

(b) Another way of protecting data in a computer system is to use passwords.

Identify methods to prevent hackers from gaining knowledge of someone's password.

....

....

5(b)	**Four** from:
	Use anti-spyware to prevent key logging
	Change passwords regularly//Do not repeat the same password
	Use a different password for each system
	Avoid common/predictable patterns as they are easier to guess
	Use longer passwords as they are harder to guess
	Use strong passwords
	Use two-factor authentication so that hackers need both parts
	Use a dropdown list for password entry
	Use a biometric password
	Do not use passwords that directly links to the user
	Do not allow webpages/device to remember the password

[4]

2   Tick (✓) whether the following statements refer to the **internet** or an **intranet**.

	internet (✓)	intranet (✓)
This type of network is public		
This is the more secure type of network		
This type of network is global		
This type of network is more likely to be monitored		

[2]

	internet	intranet
This type of network is public	✓	
This is the more secure type of network		✓
This type of network is global	✓	
This type of network is more likely to be monitored		✓

7   A company is considering developing a laptop computer that only uses biometric methods to authorise user access to this laptop computer. The developers are considering using facial recognition.

(a) Explain, giving other examples, why biometric methods are considered to be a more secure way of authorising access to the laptop computer rather than typing in passwords.

Max **five** from:
The biometric data is unique to the user
Biometric data is always with you
Passwords can be copied/forgotten/guessed/cracked
Difficult to copy/forge biometric data
Eliminates shoulder surfing
Prevents key logging software

Max **two** from, e.g.:
fingerprints, Retina scans, Voice recognition, Iris scans, Handprint

[6]

(b) Describe the disadvantages of using facial recognition to authorise access to the laptop computer.

....

Four from:
If the user wears glasses/grows a beard/damages the face/aging effects, then the laptop computer may not read the face correctly
Position of the face and distance from the screen is important
Possible concerns about personal liberty infringement/intrusive
Equipment/set up is more expensive
The system has to be set up before use and this can take more time than setting up a password
May activate accidentally
Once set up it is difficult to reset

....

....

.... [4]

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12 When people use the internet for shopping and banking it is essential that they use a website that has a secure server.

(a) Describe the features of a web page that identify it as using a secure server.

....

....

Four from:
The web address should start with https
There is a closed/green padlock
When the padlock is clicked a message will state the connection is encrypted/secure
The web page has a digital/SSL certificate
The green padlock shows it has an Extended Validation (EV) certificate/CA certificate

....

....

.... [4]

(b) As more and more people use smartphones as computer systems, security can be breached. Smishing and pharming are ways in which data can be compromised on a smartphone.

Compare and contrast smishing and pharming.

Max **four** from:
Differences
Pharming downloads a file/program/malicious code onto the user's smartphone
When the user enters a correct website the software redirects them to the fake website
When the user enters his password/personal data it is sent to the hacker's computer
Pharming can be stopped by not downloading .exe, .bat files

In Smishing the user receives a text message from an unknown person
In Smishing the user is asked to phone a number/reply to the text/click on a link
Smishing can be stopped by not replying to unknown text messages

Max **three** from:
Comparisons
Both are attacks on the smartphone
Both redirect the user to a fake company/person/fake website
Both require the user to enter/divulge personal information
Both obtain/steal personal/your data

[6]

5 Phishing and pharming can affect the security of a user's data.

(a) Compare and contrast phishing and pharming.

5(a)	Max **four** from: Comparisons Both use the internet Both redirect the user to a fake website Both can lead to fraud and identity theft Both use websites that look legitimate Personal data is compromised Max **four** from: Differences With phishing emails are sent to the computer In pharming malicious code is uploaded to the computer In phishing clicking a link sends user to a fake website In pharming the code redirects the user to a fake website without their knowledge The email in phishing appears to have come from a trusted source Website in pharming appears to be genuine In pharming spyware can be used to record key presses

[6]

(b) Smishing is another security issue. Describe the methods which can be used to help prevent smishing.

....

....

....

....

....

....

....

....

....

....

....

.... [6]

Six from:

Avoid clicking on any unknown texts with links/Avoid clicking links in texts from people you do not know.

Do not reply to text messages that have asked you about any of your personal finances/details.

Report any suspicious activity.

Be on the lookout for messages that contain the number 5000 or any number that is not a phone number as this is used by smishers.
If the text messages urge you for a quick reply then that is a clear sign of smishing.

Do extensive research before replying to any message. There are plenty websites that allow anyone to run searches based on a phone number and see any relatable information about whether or not a number is legitimate.

Never call back a phone number that was associated with the text from an unknown source.

If the message states 'Dear user, congratulations, you have won.' It is a clear sign for smishing.

Check the time when the unknown message was sent.

If the text message was sent at an unusual time, then that is another sign of smishing.

6 Tick (✓) which of the following statements apply to LANs, which apply to WANs and which apply to WLANs.

	LAN (✓)	WAN (✓)	WLAN (✓)
The internet is an example of this type of network			
This type of network is found in a building but is connected without cables			
This type of network is used to transmit data between Europe and North America			
This type of network is found in a building but is connected with cables			

[4]

	LAN	WAN	WLAN
The internet is an example of this type of network		✓	
This type of network is found in a building but is connected without cables			✓
This type of network is used to transmit data between Europe and North America		✓	
This type of network is found in a building but is connected with cables	✓		

8 Following recent data protection issues the personal data we allow organisations to share about us may be reduced.

(a) Discuss the benefits and drawbacks of trying to keep personal data confidential and secure.

Max **five** from:

Benefits
If personal data is kept confidential then identity theft is reduced
It helps prevent fraud
Reduces the chance of users suffering harm from criminals, as less data for criminals to attempt to access
Protects sensitive data
... examples:
racial/ethnic/political/religious/membership of trade unions/health/criminal activity
Protects the data being used for purposes other than what it was collected for

Max **five** from:

Drawbacks
Difficult to enforce as users give information freely
Most users do not read the terms and conditions before agreeing to them, therefore allowing data to be used
Data protection is local but networks are global so laws are difficult to enforce
Younger people do not mind that data is passed on therefore the law could not be enforced for all

[6]

(b) The sharing of email addresses can lead to spam.

Explain what is meant by the term spam email.

[2]

8(b)	**Two** from: Electronic Junk email/unsolicited emails/sent to a person without requesting it Deliberate filling up of a user's inbox/many emails sent at once Emails sent to everyone on the mailing list

(c) Explain why spam email should be prevented.

....

8(c)	**Four** from: Takes time to deal with it Can slow down networks Can fill up the receiver's mail box and therefore fill up hard disk/leads to denial of service Can increase the time needed to run your email software Could contain a virus

....

....

.... [4]

11 Most data protection acts include the principle that data should be accurate and, where necessary, kept up to date.

List **four** other principles of a typical data protection act.

1...

....

Four from:
Data should be fairly and lawfully processed
Data should only be processed for the stated purpose
Data should be adequate, relevant and not excessive/limited
Data should not be kept longer than necessary
Data should be processed in accordance with the data subject's rights
Data should be kept secure
Data should not be transferred to another country unless they have adequate protection.
Data should be processed in a transparent manner
Data should be collected for specified/explicit/legitimate purposes
Data should only be further processed for archive purposes which is compatible with the initial purposes
Data kept for archiving should safeguard the rights and freedoms of individuals
Explicit consent required for processing sensitive data
Parental consent required for processing personal data of children including online services
Data subjects are allowed access to their personal data

[4]

3   Complete the following sentences using the most appropriate network term.

A communication method that wirelessly connects a mobile phone to a car, to allow hands-free use of the mobile phone is ....

A network device that allows a stand-alone computer, using a dial-up analogue connection, to connect to an ISP is a ....

A network device that allows a LAN to connect to the internet is a ....

A wireless communication method used in WLAN is ....

3	Bluetooth
	Modem
	Router
	WiFi

[4]

6   Smishing and phishing can affect the security of a user's data.

(a) Compare and contrast smishing and phishing.

....

Max **five** from:

Comparisons
Both use communication devices to collect personal data
Both require the user to communicate quickly
Both require the user to enter personal data
Both use the internet

Max **five** from:

Differences
Smishing: fake text messages/SMS are sent to a phone
Phishing: fake emails are sent to your computer
In smishing the user may be asked to make a phone call
A smishing message is shorter than a phishing email
Easier to spot a smishing message
Smishing messages tend to use 5000 in the message

.... [6]

(b) Describe the methods which can be used to help prevent phishing.

Six from:
Avoid clicking on any unknown emails with links.
Do not reply to emails that have asked you about any of your personal data.
Report any suspicious activity.
If the email urges you for a quick reply then that is a clear sign of phishing.
Do extensive research before replying to any message, check the domain name/company name
If the email is too good to be true, it possibly is
Check the time when the unknown email was sent.
If the email was sent at an unusual time, then that is another sign of phishing.
If the to: box has a large number of similar emails to yours then it is phishing
If there are several grammar mistakes then it is suspicious

[6]

3   A computer system is connected to a LAN and a WAN.

   (a) Explain what a LAN is.

| 3(a) | **Two** from:
Local Area Network
A network within a building/site/small geographical area
Network connected by hubs and switches |

                                                                                              [2]

   (b) Explain what a WAN is.

| 3(b) | Wide Area Network
This network spans a large geographical area |

                                                                                              [2]

13 A school is planning to set up a student work files area. The school is considering allowing students to log in to the student work files area either using the school's intranet or the internet.

Discuss the advantages and disadvantages of using the school's intranet rather than the internet to access this student work files area.

Max **seven** from:

Advantages
Intranet is policed/controlled by the school
More secure as it needs a password
Intranet private network only contains information that is relevant
Intranet resides behind a firewall therefore data is more secure
Messages can target the correct students
Better bandwidth on the intranet
Access from external people are barred

Max **seven** from:

Disadvantages
More expensive to set up
More time consuming to set up
More time spent on administration i.e. passwords
May only be viewed within the school
More expensive to maintain
More time consuming to maintain
Will not be able to access school files at home for homework
School would need to provide more computers across the school for students to use to access via the intranet

[8]

One mark can be awarded for a reasoned conclusion

3   A variety of network devices can be used to connect computers together.

(a) Complete the following sentences using the most appropriate network device from the list. Your answers must be different in each case.

| an access point | a bridge | a hub |
| a modem | a network interface card | a switch |

A device used to connect a Local Area Network (LAN) to another LAN that uses the same protocol is called ....

A device used to convert a computer's digital signal to an analogue signal for communication is called ....

A device that connects a number of other devices and sends data to one specific device only is ....

An item of hardware in a computer that allows a device to connect to a network is

....

[4]

3(a)	A bridge A modem A switch A network interface card They are in this order All answers must be different

A router is used to connect a LAN to the internet. A message is sent from the router to another router.

(b) Give the name of the part of the router where the IP addresses are stored.

....

.... [1]

3(b)	Routing table

(c) Explain how the data from a router is routed.

....

3(c)	**Five** from: Data is sent in data packets//uses data packets Each data packet contains an IP address of the next router The router reads/checks/inspects the IP address It checks the IP address against its routing table Data packet is sent to the router with the IP address The router uses the IP address to work out the best route/destination computer The router stores the IP addresses

....

....

....

.... [5]

6   Data stored in a computer needs to be protected.

(a) Describe what is meant by encryption.

....

6(a)	**Three** from: This is the scrambling of data Makes the data not understandable/meaningless This system uses an encryption key to encrypt the data This system uses an encryption/decryption key to decrypt the data Protects sensitive data

.... [3]

5 (a) Compare and contrast an intranet with the internet.

....

....

Eight from:

Similarities
Both are communication systems
Both use internet technologies
Both use HTML to write the web pages
Both are information systems
Both are networks

Differences
An intranet has private access whereas the internet has public access
An intranet is policed whereas the internet anyone can post material
The data on an intranet is moderate whereas /the internet is not moderated
The data access on an intranet is more secure than the internet
Internet has greater amount of information than intranet
Intranet is within an organisation whereas the internet is world-wide
Data in the intranet is more relevant/reliable than information found on the internet

To gain full marks there must be at least one from each section

.... [8]

(b) When customers shop online, they can pay using a debit card.

Describe measures that customers could use to reduce fraud when using a debit card online.

8(b)	**Five** from: Use <u>up to date</u> anti-spyware/anti-virus to stop phishing and pharming attacks Using websites that encrypt data when sent/green padlock/use HTTPS/SSL Ensuring that strong passwords are used Passwords used for the online shopping account should be different to other passwords you use Check all transactions carried out with the store/receipts Type in the web address of the supermarket rather than copy and paste/click on links from an email Do not buy from untrusted websites/apps Ensure that the wireless password to the router is strong Report any phishing attempts Disable cookies/delete cookies frequently

[5]

(c) Smishing, pharming and phishing are three security threats that can occur when using the internet for shopping.

Tick (✓) whether the following statements refer to **pharming**, **phishing** or **smishing**.

	pharming (✓)	phishing (✓)	smishing (✓)
Fake emails are sent to target users			
When the user types in a URL they are directed to a fake website			
Malicious code is installed on the user's computer			
Fake text messages are sent to the user's phone			

[4]

	pharming (✓)	phishing (✓)	smishing (✓)
Fake emails are sent to target users		✓	
When the user types in a URL they are directed to a fake website	✓		
Malicious code is installed on the user's computer	✓		
Fake text messages are sent to the user's phone			✓

9   Legal documents can be sent by email, as a file attachment, or by physical fax.

(a) Describe the advantages of using emails compared with physical faxing.

....

Five from:
The document/attachment loads directly into the computer's memory therefore better security
The computer need not be switched on
The computer receives a soft copy
The fax does one thing at once therefore could be engaged
The document in an email is in digital format
Easier to send to multiple recipients
People are more likely to have email rather than fax
Print quality is better with email
More accessible as it is can be sent/received by many devices
The process of faxing is slower as the document needs to be scanned before sending
With fax the paper could get damaged during scanning/printing
Videos and audio can be sent by email

[5]

A legal document is sent as a file attachment.

(b) Explain the steps that need to be taken to ensure that if a virus is attached to the file, it cannot infect the computer.

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....

Four from:
The system must have installed anti-virus software
The anti-virus software must be up to date/updated regularly//download anti-virus
The email/attachment is scanned by the anti-virus software
The email is not opened/attachment downloaded until any virus is removed by the anti-virus software

....

[4]

A computer virus has been downloaded from an infected file.

(c) Describe **three** effects this could have on a computer.

1 ....
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2 ....
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3 ....
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| 9(c) | **Three** from:
Hard disk could be filled up
The computer is performing routine tasks a lot more slowly
Pop-ups keep appearing on the screen at random.
Random reboots
Software errors/software/computer doesn't work properly
Recycle bin/files not working
Computer hanging
Anti-virus stops working
System lock-up
Files are being deleted | [3] |

8   A company has offices in London and Beijing. The managers of the company meet in person, at a face-to-face meeting twice a year in their conference rooms either in the London office or the Beijing office. The cost of air travel has caused the managers to consider using video-conferencing rather than holding face-to-face meetings.

(a) Discuss the benefits and drawbacks to the company of using video-conferencing. You should ignore the cost of air travel in your argument.

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.... [8]

(b) Apart from a keyboard and a mouse, identify **three** other hardware devices which must be present for a video-conference to take place.

1 ....

2 ....

3 .... [3]

Question	Answer	Marks
8(a)	Max **five** from **Benefits** Can call meetings at short notice Employees save time travelling No hotel expenses Safer as participants do not have to travel No need to transport/carry equipment/lots of documents No risk of losing documents in transit Max **five** from **Drawbacks** Takes time/costs money to learn new technology/to be trained Difficult to have international meetings because of time differences Initial cost of hardware (and software) Equipment can break down/power cuts can stop conference Poor strength of signal/time lag/lip sync can be a problem/connection can be lost Loss of personal/social contact Legal documents cannot be signed A mark can be awarded for a reasoned conclusion	8

8(b)	**Three** from Router Web cam Microphone Network card Speakers Large monitor/data projector Codecs	3

5 A desktop computer is already used in an office which does **not** have an internet connection.

   (a) Name **two** items of hardware which would enable the computer to be connected to a local area network.

   1 ....

   2 .... [2]

   (b) Name **one** item of hardware which would enable the network to be connected to the internet.

   .... [1]

(c) Tick whether these statements are **true** or **false**.

	true	false
Booking a theatre ticket is an example of online processing.		
Producing utility bills is an example of online processing.		
An internet browser is used by web designers to test web pages.		
An internet browser uses an inference engine.		

[2]

5 **(a)** Any **two** from:
  − hub
  − switch
  − NIC
  − bridge

(b) router/modem [1]

(c)

	true	false
Booking a theatre ticket is an example of online processing.	✓	
Producing utility bills is an example of online processing.		✓
An internet browser is used by web designers to test web pages.	✓	
An internet browser uses an inference engine.		✓

4 correct answers – 2 marks
2 or 3 correct – 1 mark
1 correct – 0 marks

[2]

1 For each of the different statements, tick the most appropriate network.

	WAN (✓)	WLAN (✓)	LAN (✓)
A cabled network used in one building.			
The internet is an example of this type of network.			
Several networks connected together using a router.			
This network is connected without cables.			

[4]

Question	Answer				Marks
1		**WAN** (✓)	**WLAN** (✓)	**LAN** (✓)	4
	A cabled network used in one building.			✓	
	The internet is an example of this type of network.	✓			
	Several networks connected together using a router.	✓			
	This network is connected without cables.		✓		

4 A router is used in networks.

Describe how a router routes data packets.

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.... [3]

Question	Answer	Marks
4	**Three** from: Inspects the data packets received Checks the destination IP address… …using the stored routing table It uses a routing table which lists all the different routes to other networks Uses the IP address to work out the best route… …sends the data packet to the next router	3

12 The internet a

(a) Explain

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(b) Explain what is meant by an intranet.

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.... [3]

(c) Describe the advantages of using the internet to research information for a technical project.

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.... [6]

12(c)	**Six** from:	
	Vast amount of information available More up to date information is available as information in books may be outdated Wider range of information from every level of society/scholarly to research Information can be found quicker using specialist search engines Information can be researched at home rather than using research libraries Don't have to waste time going to the library Don't have to spend money going to the library Ability to discuss topics far easier with people from around the world Ability to get wider range of opinions. Allows emailing therefore sending/collecting information far quicker than manual methods Data is digital therefore can be easier to transfer to documents Online conferencing can be carried out	

12(b)	**Three** from:	3
	Internal restricted access network/secure network Uses same protocols as the internet Private network Used within an organisation e.g. school Limited resources	

7 A number of devices are used to enable computers to communicate within a network. Two of these devices are hubs and switches.

(a) Compare and contrast the use of a hub and a switch.

(b) Bluetooth is an alternative method of allowing computers to communicate with other computers and devices.

Describe how a tablet computer can connect to a printer using Bluetooth.

(a) Compare and contrast the use of a hub and a switch.

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.... [4]

Question	Answer	Marks
7(a)	**Four** from: **Similarities** A hub and a switch both are used to connect devices to form a LAN Both a hub and a switch use data packets A switch is a type of hub Both check/read the data packets **Differences** In a hub a data packet is broadcast / sent to every computer or device on the LAN whereas in a switch the data packet is sent to a specific computer Security is lower in a hub as all data is broadcast In the switch the destination address is determined/looked up before it is sent whereas in a hub data packets are sent to all A switch uses MAC addresses to locate the destination of the device whereas is a hub MAC addresses are not checked A switch uses a look up table to determine destination this is not required in a hub A switch is capable of more functionality / multiple VLANs but not in a hub To gain full marks both similarities and differences are required	4

7(b)	**Four** from:	4
	The devices automatically connect when they come into range Tablet sends radio signals to the printer / printer receives radio signals from the tablet Tablet receives radio signals from the printer / printer responds using radio signals A handshake takes place Award a mark for mention of use of 4 digit code for access / default code / auto connection with code / some devices don't need code Uses a band of 79 radio frequencies / channels The tablet computer randomly chooses one of the radio frequencies / channels to use If it is being used it chooses another at random until it finds a free one Uses spread-spectrum frequency hopping 2 marks can be awarded for a good description of the handshake.	

3 A media company with branches around the world has recently opened a new branch in London. The branch includes a number of different computer networks. Identify the most appropriate type of network to answer each of the questions.

(a) The type of network used to connect the branch to its head office in New York is called a

.... [1]

(b) The type of cabled network used to connect computers together in one of the offices is called a

.... [1]

Question	Answer	Marks
3(a)	Wide Area Network	1
3(b)	Local Area Network	1

12 A motor car company has some designers based in London and some in Beijing. The cost of travel between the two cities is very high, so when they wish to meet to discuss new products they use video-conferencing.

(a) The designers all have PCs with a keyboard and a mouse in order to take part in video-conferencing.

Name **three** other devices used to input or output data which would be needed to take part in the video-conference.

1 ....

2 ....

3 ....

[3]

(b) Describe **three** potential problems of the designers using video-conferencing systems rather than meeting in either London or Beijing.

1 ....

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2 ....

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3 ....

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[3]

(c) Documents that are sent between the two cities are encrypted.

Explain what encryption is and why it is used.

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.... [3]

Question	Answer	Marks
12(a)	**Three** from: Webcam / video camera Speakers / headset / headphones Large monitor / television / data projector Microphone	3

Question	Answer	Marks
12(b)	**Three** from: Time lag / lip sync caused by the image not being synchronised with the sound Poor picture quality caused by the speed of connection / quality of the hardware More likely to have poorer sound quality caused by the quality of the hardware / connection Confidential material about the new cars may have to be signed / viewed in person The new car may have to be viewed in person Hardware breakdown stops the conference taking place Communication breakdown stops the conference taking place Different time zones will mean the conference has to take place at inconvenient times	3
12(c)	Max **two** marks from: Scrambling / encoding of data / convert plain text to cypher text Uses encryption software / key to encrypt it Requires a decryption / encryption key / software to decrypt Max **two** marks from: Meaningless to the hacker Secures data being transferred from computer to computer Protects sensitive data To gain full marks the answer must include **both** explanation and use	3

3 Tick the most appropriate type of network for each description.

	LAN (✓)	WAN (✓)	WLAN (✓)
A cabled network in a building.			
A network that can use satellites.			
A network that connects countries.			
A network that uses wireless technology.			

[4]

Question	Answer				Marks
3		**LAN (✓)**	**WAN (✓)**	**WLAN (✓)**	4
	A cabled network in a building.	✓			
	A network that can use satellites.		✓		
	A network that connects countries.		✓		
	A network that uses wireless technology.			✓	

12 A company used to have video-conferences with its suppliers, but due to technical problems they are considering running an audio-conference.

Describe the advantages of using audio-conferencing rather than video-conferencing.

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.... [4]

Question	Answer	Marks
12	**Four** from: Audio-conferencing does not have time lag Lip sync errors cannot occur on audio-conferencing In video-conferencing sound quality can be poorer Video-conferencing needs expensive / extra hardware Video-conferencing requires the internet In video-conferencing there is a lack of stability of the system / communication as there is more chance of it disconnecting / hanging In audio-conferencing only voice is sent / received in video-conferencing sounds and vision is sent / received this can cause issues	4

13 An organisation is planning to train all staff online rather than by video-conference.

(a) Describe what is meant by a web-conference.

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.... [3]

(b) Explain the differences between video- and web-conferencing.

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.... [3]

Question	Answer	Marks
13(a)	**Three** from: A web-conference is conducted online/VOIP Web-conference uses IP technology/addresses Participants tend to be sat at computers and can view/hear other participants Web-conferences tend to be interactive Organiser allows participants to click a link to ask questions … … participants are then queued Possible to draw or write on a 'whiteboard' using keyboard and mouse Possible to integrate chat, instant-messaging and communicate verbally	3
13(b)	**Three** from: Video-conferencing provides real-time two-way audio/video communication whereas web-conferencing can be either two-way or a webcast Video-conferencing tends to be via the internet whereas web-conferencing uses a phone or VOIP Video-conferencing requires specialised equipment on both ends for a successful connection whereas web-conferencing uses a computer Video-conferencing participants use a shared microphone and speakers whereas web-conferencing participants sit at their own computers Sound quality on video-conferencing is poorer than web-conferencing	3

16 The manager of a large company wants to replace the company's cabled LAN with a WLAN.

Describe the features of a WLAN.

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.... [6]

Question	Answer	Marks
16	**Six** from: WLAN is wireless therefore devices can be easily added/changed WLAN is wireless so relatively easy to connect to portable devices WLAN uses radio signals/wireless technology/wifi WLAN uses (wireless) access points/wireless node WLAN has a limited range WLAN signal strength can diminish the further away from the access point WLAN signals affected by walls/obstacles WLAN is more prone to hacking than cabled systems WLAN susceptible to interference from another radio signals	6

18 As more and more people use the internet at home to carry out transactions they are at risk of downloading software that could corrupt files or copy credit card details.

Discuss the effectiveness, or otherwise, of using different methods of increasing the security of a home computer.

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Question	Answer	Marks
18	To be marked as a level of response: Level 3 (7–8 marks): To gain a level 3 there must be a <u>reasoned conclusion</u> and <u>a justification</u> and must have <u>both sides</u> of the argument Award a mark for justification of the points raised Award a mark for a reasoned conclusion Level 2 (4–6 marks): For level 2 there must be more than three statements; which cover <u>both sides</u> of the argument and achieved all of Level 1 Level 1 (1–3 marks): For level 1 there must be statements up to max three Level 0 (0 marks): Response with no valid content	8
	Examples of answers written below Answers may make reference to, for example: Up to date antivirus software needed/scan files/attachments when downloading/install anti-virus software Computer/emails/uploads need to be scanned regularly Firewall required to stop attacks from suspicious computers Has a blocked website list/has a white list A firewall can be looked through therefore two are better than one Stops fraudulent sites attacking the computer Up to date anti-spyware software can be used Use of strong passwords Changing passwords from default passwords Regularly changing passwords Using different passwords for sites Not using a computer/mobile device in a public area Data on the cloud needs to be encrypted and have a strong password Good antivirus can be expensive to purchase Free antivirus software may not be up to date This can cause memory issues in the computer as updates use memory Antivirus needs to be in operation at all times slowing the operation of the computer	
	Some legitimate software can be blocked by the firewall Spyware sends a user to a fraudulent website and records key logs User does not know that the spyware has been uploaded Popups are stopped by anti-spyware, pop-under are not Too complex a password can be easily forgotten Password files may not be backed up Hackers can breach most passwords	

2 Tick whether the following activities relate to the use of **email**, **electronic fax** or **both**.

	email (✓)	electronic fax (✓)	both (✓)
Can be used as a legal document			
Allows video attachments to be added to the message			
Requires a telephone number			
Messages can be sent to a computer			

[4]

Question	Answer	Marks
2	1 mark for each correct row. 	4

	email (✓)	electronic fax (✓)	both (✓)
Can be used as a legal document			✓
Allows video attachments to be added to the message	✓		
Requires a telephone number		✓	
Message can be sent to a computer			✓

11 Tick whether the following activities relate to an intranet, the internet or both.

	intranet (✓)	internet (✓)	both (✓)
This is a restricted access system.			
This system can use email for communication.			
This is a public system.			

[3]

Question	Answer	Marks
11	1 mark for each correct row.	3

	intranet (✓)	internet (✓)	both (✓)
This is a restricted access system	✓		
This system can use email for communication			✓
This is a public system		✓	

3 Pupils working on a science project use the school network to store and retrieve files. They log onto the network using individual passwords.

(a) Abisha is using his name as his password.

Give **two** reasons why this is not a good idea.

1 ....

....

2 ....

....

[2]

(b) Give **two** other pieces of advice the teacher should give regarding the management of passwords.

1 ....

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2 ....

....

[2]

Question	Answer	Marks
3(a)	**Two** from: Password is too short Easy to guess Personal information used in the password Doesn't contain a mixture of upper case, lowercase, numbers or symbols	2
3(b)	**Two** from: Change passwords regularly Use a strong password Do not write the password down Do not tell anyone else the password Must be easy for the user to remember	2

9   Describe how a router forwards data packets from one network to another.

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.... [3]

Question	Answer	Marks
9	**Three** from: The router reads the data packet destination address Looks up the paths to get to that address Compares to its routing table to get to the destination address Checks how busy the paths are Sends the packet on the least congested/quickest path	3

14 Emails are a very popular way of communicating.

Tick **four** statements, relating to emails that are true.

	Tick (✓)
Emails can only be sent from a computer.	
An email can be used to send a message to many people at the same time.	
It always takes a long time for an email to arrive.	
All emails must have an attachment.	
Attachments may have to be compressed to be sent via email.	
Emails can be used to send legal documents.	
Every email has to be printed out.	
In order to send an email back to the sender without retyping the address, reply is used.	
Email means extended mail.	
Email attachments are always checked for viruses before they are sent.	

[4]

Question	Answer		Marks
14		Tick (✓)	4
	Emails can only be sent from a computer.		
	An email can be used to send a message to many people at the same time.	✓	
	It always takes a long time for an email to arrive.		
	All emails must have an attachment.		
	Attachments may have to be compressed to be sent via email.	✓	
	Emails can be used to send legal documents.	✓	
	Every email has to be printed out.		
	In order to send an email back to the sender without retyping the address; reply is used.	✓	
	Email means extended mail.		
	Email attachments are always checked for viruses before they are sent.		

2 Tick the most appropriate device matching the statements.

	Hub (✔)	Switch (✔)	Router (✔)
Connects a LAN to a WAN.			
Broadcasts data to all connected devices.			
Connects two LANs.			
Selects which device to send data to.			

[4]

Question	Answer				Marks
2		Hub (✔)	Switch (✔)	Router (✔)	4
	Connects a LAN to a WAN			✓	
	Broadcasts data to all connected devices	✓			
	Connects two LANs			✓	
	Selects which device to send data to		✓		

9 A London based radio company is planning to cover the Commonwealth Games in Australia. Their staff will hold video-conferences with the games organisers.

(a) Describe what is meant by video-conferencing.

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.... [4]

(b) Describe **four** disadvantages to the radio company of using video-conferencing rather than face-to-face meetings in this scenario. A face-to-face meeting is when the staff attending the meeting are all together physically in one room.

1 ....

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2 ....

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3 ....

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4 ....

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[4]

Question	Answer	Marks
9(a)	**Four** from: Video-conferencing is the use of telecommunication technologies It uses an internet connection It allows people in two or more locations to communicate Allows long distance communication Using simultaneous two-way communication Uses video and audio transmissions/streaming	4
9(b)	**Four** from: Video conferencing equipment can be expensive to buy The communication link could be expensive to set up and operate/satellite/internet link needed Lip sync/lagging can be an issue If the hardware breaks down the conference fails // poor connection conference fails Time zones as the games are in Australia and company is based in London Needs organising as to who's turn it is next // not talk at the same time Any sound in the conference can be picked up by microphones Open microphones can distort the sound	4

11 Security of data is a major concern for people using computer systems. One method of protecting the data is to use a strong password. This is an authentication technique.

   (a) Name **three** other authentication techniques that could be used.

   1 ....

   2 ....

   3 ....

   [3]

   (b) A typical data protection act tries to protect the data of living individuals. One way of achieving this is by keeping data secure.

   Identify **four** other principles of a typical data protection act.

   1 ....

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   2 ....

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   3 ....

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   4 ....

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   [4]

Question	Answer	Marks
11(a)	**Three** from: Biometrics e.g. iris scan, face scan, retina scan Physical Tokens/TAN Two-factor/two-step/multi-factor authentication Magnetic stripes ID cards Memorable information // security question	3

Question	Answer	Marks
11(b)	**Four** from: Data must be processed fairly and lawfully Data must be used for the purpose it was collected for Data must be adequate and relevant to the purpose it was collected for Data must be kept up to date and accurate Data must not be kept longer than necessary Data must be processed within the rights of data subjects Data must not be moved to any other country that is not protected by a data protection act Must allow access to data	4

3   Tick whether the following statements about networks are **true** or **false**.

	true (✓)	false (✓)
A hub is a central computer.		
A router connects a LAN to the internet.		
A bridge connects a WAN to a LAN.		
A switch connects computers in a network.		

[2]

Question	Answer			Marks
3		true (✓)	false (✓)	2
	A hub is a central computer.		✓	
	A router connects a LAN to the Internet.	✓		
	A bridge connects a WAN to a LAN.		✓	
	A switch connects computers in a network.	✓		
	4 correct answers – 2 marks 2 or 3 correct answers – 1 mark 0 or 1 correct – 0 marks			

7   Explain the purpose of an intranet.

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....[3]

Question	Answer	Marks
7	Any **three** from: Private/confidential data stays within a company/organisation/school To store relevant/up to date information about the organisation available to workers To facilitate communication/collaboration between workers/students/teachers Make it easier to access company specific applications. Restrict access to certain sites of the internet/regulate access to the internet Restrict access for certain employees	3

18   Many devices in the home can now connect directly to the internet.

Smartphones and computers used in the home can connect to the internet.

Discuss the benefits and drawbacks of using other devices that connect to the internet in the home.

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....[8]

Question	Answer	Marks
18	To be marked as a level of response: **Level 3 (7–8 marks):** Candidates will address both aspects of the question and discuss/consider different benefits and drawbacks. The issues raised will be justified. There will be a reasoned conclusion. The information will be relevant, clear, organised and presented in a structured and coherent format. **Level 2 (4–6 marks):** Candidates will address both aspects of the question and discuss/consider different benefits and drawbacks although development of some of the points will be limited to one side of the argument. There will be a conclusion. For the most part the information will be relevant and presented in a structured and coherent format. **Level 1 (1–3 marks):** Candidates may only address one side of the argument, and give basic benefits and drawbacks. Answers may be simplistic with little or no relevance. **Level 0 (0 marks)** Response with no valid content.	8
	Answers may make reference to e.g.: **benefits of smart technology** Smart technology devices can be used to turn on devices remotely.... ...if you are coming home you can turn on cookers ...you can come home to a warm house by turning on central heating Smart fridges can analyse food taken out of fridge so you can get a healthy diet ...also re-orders stock automatically Smart washing machines stop washes if incorrect materials present in the wash it new materials are produced then the washing machine can analyse the materials and tell you the correct dose of powder if you want to watch up to date films then then TV can connect to the internet **drawbacks to smart technology** Over reliance on technology; if the device breaks down then it is difficult to use alternatives If the device breaks it is more difficult to repair Personal data can easily be hacked through internet connected devices ...personal data easily found ...wifi key easily found If controller/smart phone lost/stolen the devices may not work in the home New technology is expensive Too many gadgets reliance on internet connection.	

8   A company is setting up a video-conference.

   (a) Name **three** computer hardware devices they would need.

   1...

   ....

   2...

   ....

   3...

   ....

   [3]

   (b) The company could have set up a web-conference rather than a video-conference.

   Describe what is meant by a web-conference.

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   .... [4]

Question	Answer	Marks
8(a)	Any **three** from: – Video/digital camera/webcam – Microphone – Keyboard – Large screen/monitor/data projector – Remote control – Speakers/headphones	3
8(b)	Any **four** from: – A conference held over the internet using TCP/IP connections – Examples webinars/webcasts/VOIP – Can be point to point (VOIP) or multicast – Allows text communication – Allows voice communication – Allows video communication – Uses a web browser	4

2   Tick whether the following statements are **true** or **false**.

	true (✓)	false (✓)
A router is required to allow a LAN to connect to the internet		
A web browser displays a web page		
An intranet has restricted access		
ISP means Internal Service Provider		

[2]

Question	Answer	Marks
2	 |	true (✓)	false (✓)
A router is required to allow a LAN to connect to the internet	✓	
A web browser displays a web page	✓	
An intranet has restricted access	✓	
ISP means Internal Service Provider		✓ | 4 correct answers 2 marks 2 or 3 correct answers 1 mark 1 or 0 answers no marks	2

16   Bluetooth and WiFi can connect devices together.

Discuss the advantages and disadvantages of using Bluetooth or WiFi.

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Question	Answer	Marks
16	To be marked as a level of response: **Level 3 (7–8 marks):** Candidates will give reasoned advantages and disadvantages. There will be a reasoned conclusion. They will relate the answer to both Bluetooth and WiFi. The information will be relevant, clear, organised and presented in a structured and coherent format. **Level 2 (4–6 marks):** Candidates will expand on advantages/disadvantages relating the answer to both Bluetooth and WiFi. Some of the points may be one sided. There may be a conclusion. For the most part the information will be relevant and presented in a structured and coherent format. **Level 1 (1–3 marks):** Candidates only list an advantage/disadvantage. Candidates only refer to Bluetooth or WiFi. Answers may be simplistic with little or no relevance. **Level 0 (0 marks)** Response with no valid content	8
	Answers may make reference to, for example: Bluetooth is more useful when transferring data between two devices whereas WiFi is more suited to full scale networks Bluetooth does not buffer The devices connected via Bluetooth should be near to each other whereas WiFi has a larger range Less data tends to be transferred with Bluetooth Bluetooth uses a lower bandwidth Eg sound data (phones) or file transfer (computers) WiFi has better security than Bluetooth Cost of Bluetooth is cheaper than WiFi Bluetooth has a shorter password Bluetooth devices are battery operated which needs to be replaced or recharged but WiFi do not necessarily use batteries To connect to the network need a Bluetooth adapter but WiFi needs a WiFi adapter, a wireless router and a wireless access point Bluetooth range is approx. 20m whereas WiFi is approx. 100m Bluetooth is simple to use and setup but WiFi is more complex Bluetooth/Wifi are both wireless can't fall over the wires/move around the house Saves money (on cables) as both do not require wires Bluetooth is more energy efficient than wifi in some cases 3% of the energy	

2   Complete each sentence below using the most appropriate item from the list.

   a bridge   a hub   a keyboard   a microphone   a mouse

   a printer   a router   a scanner   a sensor   a switch

   (a) A network device which broadcasts data passing through it is called

   ....[1]

   (b) A network device that connects a LAN with the internet is called

   ....[1]

   (c) A network device that connects a LAN to another LAN using the same protocol is called

   ....[1]

   (d) A network device that learns which devices are connected to which ports is called

   ....[1]

Question	Answer	Marks
2(a)	a hub	1
2(b)	a router	1
2(c)	a bridge	1
2(d)	a switch	1

6   Describe the differences between the internet and an intranet.

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   ....[4]

Question	Answer	Marks
6	Any **four** from: The internet is a public network whereas an intranet is a private network/restricted access An intranet is policed or managed whereas the internet has no rules The data on an intranet is moderated whereas the internet is not moderated An intranet is more secure than the internet Internet has greater amount of information than an intranet	4

8 Computers can be subject to hacking.

Explain what is meant by hacking and the effect it can have on the data or the computer.

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....[2]

Question	Answer		Marks
8	<u>Unauthorised</u> access to <u>computer systems</u>	1 mark	2
	Any **one** from: Data on the computer system can be corrupted, edited, deleted, viruses added Data on the computer system can be copied/stolen/misused Data on the computer system can be accessed/read	1 mark	

9 A technician has told Moira that her computer might have a virus.

Describe **three** reasons why the technician might think this.

1 ....

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2 ....

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[3]

Question	Answer	Marks
9	Any **three** from: She has not much space left on her hard disk even though she had previously Her computer is performing routine tasks a lot more slowly. Pop ups keep appearing on her screen at random. Her friends keep telling her that emails about strange things are being sent by her Random reboots Software errors Recycle bin not working Computer hanging Anti-virus stops working	3

10 A new employee of a company is required to log on to the company's computer system and will need to create a suitable password.

(a) Give **three** rules that the company would have in place, to help the employee choose a password.

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[3]

(b) He changes his password to R4hB5&Fg1

Explain why he has chosen this password.

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....[3]

(c) When a password is changed it is verified.

Identify the type of verification which is carried out.

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....[1]

Question	Answer	Marks
10(a)	Any **three** from: Use of strong passwords Do not use pet names Do not use personal information Do not use birthdates Do not use a password they have used before Do not use company name	3
10(b)	Any **three** from: Conforms to company rules Hard to guess Stop shoulder surfing Hard to crack	3
10(c)	Double data entry	1

15 Many people think there should be greater control of the use of the internet.

Describe the advantages and disadvantages of policing the internet.

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....[5]

Question	Answer	Marks
15	Any **four** from: **Advantages** Helps to prevent illegal materials from being shown Helps to prevent pornography (for minors) Helps to prevent discussion groups that incite hatred, racism, etc Ensure copyright laws are enforced Remove the Dark Net Safeguards the vulnerable Any **four** from: **Disadvantages** Unsuitable material is easily available in other ways The rise of mobile communications lessens the impact of the internet Freedom of speech is restricted Very difficult to enforce as the internet spans continents Maximum 5 marks	5

1 Tick whether the following statements would apply to a **LAN**, a **WAN** or a **WLAN**.

	LAN (✓)	WAN (✓)	WLAN (✓)
The internet is an example of this type of network			
A wired network found within a single building			
This network uses wireless technology			
This network is spread over a large geographical area			

[4]

Question	Answer				Marks
1		LAN (✓)	WAN (✓)	WLAN (✓)	4
	The internet is an example of this type of network		✓		
	A wired network found within a single building	✓			
	This network uses wireless technology			✓	
	This network is spread over a large geographical area		✓		

5 (a) Describe the processes a web browser has to go through to load a web page.

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....[2]

An organisation is creating a company website and is deciding whether to make it available on the internet or create a company intranet. The website will contain confidential information.

(b) Explain why they should use an intranet rather than the internet.

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....[6]

Question	Answer	Marks
5(a)	Any **two** from: Request made by entering a web address/URL or clicking on a link Retrieves code from the server/resources downloaded Interprets the code as a web page/uses page resources to build page The web page is displayed/renders page to view	2
5(b)	Any **six** from: An intranet has restricted access/private network therefore public cannot gain access/the internet is public access The intranet is protected by passwords/More chances of hacking on the internet The intranet has reduced unauthorised access to material The material may be sensitive on the intranet Intranet only used in the organisation/internet is world wide An intranet will only contain relevant information for the company The company has more control of data on an intranet An intranet is policed or managed/the internet has no rules The data on an intranet is moderated/the internet is not moderated	6

February/March

6   Use examples to describe the difference between a weak password and a strong password.

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....[4]

6   <u>Good</u> <u>example</u> of a strong password – (1 mark)

<u>Good</u> <u>example</u> of a weak password – (1 mark)

Any **two** from:

Weak password is easy to guess/strong password is difficult to guess
Weak passwords consist of all letters or all digits or all digits with one letter/all letters with one
digit
Weak password is one that has few characters
Strong password uses mixture of upper case letters, digits and punctuation marks
Weak password has repeated characters
Weak password has characters next to each other on a QWERTY keyboard
Weak passwords are ones that are similar to the user name
Weak passwords are passwords that relate to the user   [4]

8   Describe how data is sent from a networked computer to a computer on a different network.

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....[4]

8   Any **four** from:

Router
The network software in the original computer determines that the destination computer is on a different network...
...using IP addresses
Data is sent to the switch/hub and then passed to router
the router then passes it to the router of the other network
that router passes it to the switch/hub…
…to the destination computer

Bridge
The computer sends the data to the bridge via the hub/switch…
...using MAC addresses
if the protocol/MAC address is same, bridge passes data to the other network
Bridge passes it to the switch/hub…
…to destination computer with correct MAC address   [4]

9   (a) Describe **two** similarities between physical faxing and electronic faxing.

1 ....

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2 ....

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                                                                                                                        [2]

(b) Describe **three** differences between physical faxing and electronic faxing.

1 ....

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2 ....

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                                                                                                                        [3]

9 (a) Any **two** from:

Both involve you being assigned a fax (phone) number
Both can involve use of a hard copy original
Both require the use of a phone line [2]

(b) Any **three** from:

Physical faxing requires purchase of a fax machine/electronic faxing requires use/purchase of a computer/scanner
Physical faxes can be picked up by anyone/electronic faxing goes straight to your email address
Physical faxes – phone-line could be busy/engaged – electronic faxes – phone line never registers as busy/engaged
Physical faxes – must have paper and can get paper jams
Electronic fax is quicker to arrive than physical [3]

5 Most data protection acts include the principle that data should be stored securely.

List **four** other principles of a typical data protection act.

1 ....

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2 ....

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3 ....

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[4]

5 **Four** from:

Information must be processed fairly and lawfully
Information collected must be processed for limited purposes
Information collected must be adequate, relevant and not excessive
Information collected must be accurate and up to date
Information must not be held for longer than is necessary
Information must be processed in accordance with the individual's rights
Information should not be transferred outside the area of the Act unless adequate levels of protection exist. [4]

8   Describe the details of computer addresses that are stored by a router.

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.... [4]

8	**Four** from:
	Stores IP addresses
	IP address is a unique identifier set up by network manager/ISP
	Can change but should match the network it's on
	IP address consists of 4 numbers separated by full stops
	Stores MAC addresses
	6 pairs of hexadecimal digits
	MAC address is usually hard coded by manufacturer, never changes [4]

19   Discuss the effectiveness of different methods which could be used to prevent unauthorised access
     to a laptop computer.

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19 To be marked as a level of response:

Level 3 (7–8 marks)
Candidates will describe in detail the reliability and unreliability of at least two methods of preventing unauthorised access to data.
Examples will be given and will be appropriate.
The information will be relevant, clear, organised and presented in a structured and coherent format.
Specialist terms will be used correctly and appropriately.

Level 2 (4–6 marks)
Candidates will describe the reliability or otherwise of methods of preventing unauthorised access to data.
For the most part, the information will be relevant and presented in a structured and coherent format.
Examples will be given and will be mostly appropriate.
Specialist terms will be used appropriately and for the most part correctly.

Level 1 (1–3 marks)
Candidates will identify some of the methods of preventing unauthorised access to data.
Answers may be in the form of a list.
There will be little or no use of specialist terms.
Errors of grammar, punctuation and spelling may be intrusive.

Level 0 [0 marks]
Response with no valid content

Examples of reliability of methods
User id and Password will…
…prevent users who do not know the password from gaining access
…will reject users who try to guess passwords (usually after 3 attempts)
Strong passwords using a mixture of alphabetic, alphanumeric and special characters…
…will be difficult to guess
Biometrics are unique and are almost impossible to duplicate…
…only the user who has those characteristics can access the laptop
Using biometrics means that passwords don't have to be remembered
Laptops can now come with fingerprint scanner
Laptops can have built in retina identification

Examples of lack of reliability
Strong passwords can be difficult to remember
…can be easily forgotten
…can be easily disclosed to any user
Software for retina scan can malfunction
User can have fingerprints affected by injury/cut on a finger
Laptops with this technology tend to cost more
Low cost fingerprint technology tends to be inaccurate
Fingerprints can be copied by expert thieves   [8]

3   Tick whether the following statements would most appropriately apply to the **internet** or an **intranet**.

	internet (✓)	intranet (✓)
A public computer network.		
Is easier to protect sensitive data from hackers.		
The content is more easily controlled.		
Exists within a single organisation only.		

[2]

3

	Internet (✓)	Intranet (✓)
A public computer network	✓	
It is easier to protect sensitive data from hackers		✓
The content is more easily controlled		✓
Exists within a single organisation only		✓

4 correct answers – 2 marks
2 or 3 correct answers – 1 mark
1 correct – 0 marks

[2]

6 A school's Science department has a network which uses WiFi. A teacher has a laptop computer and whilst in school wishes to connect to this network.

   (a) Write down the name of this type of network.

   .... [1]

   (b) In order to access the network the laptop must be within range of a type of WiFi network device.

        (i) Write down the name of this type of device.

        .... [1]

        (ii) Describe how this device is connected to the network using an ethernet cable.

        ....

        .... [1]

   (c) WiFi networks can be limited in their range.

        Describe **one** other disadvantage of a WiFi network compared to a cabled network.

        ....

        .... [1]

6	(a) A WLAN	[1]
	(b) (i) A (Wireless) Access Point/wireless node	[1]
	(ii) It is connected to a switch/hub	[1]
	(c) Can get interference from another radio signal/speed of data transmission can be slower Other valid answers like physical obstacles/walls	[1]

7 (a) Explain what is meant by VOIP.

   ....

   ....

   ....

   .... [2]

(b) Name **two** items of computer hardware that are needed in order to make a VOIP phone call from one computer to another.

1 ....

2 ....

[2]

7 **(a)** **Two** from:

Voice over Internet Protocol
A set of rules that enable people to use the Internet to make telephone calls/talk each other
Sends voice data in packets using IP [2]

(b) **Two** from:

Microphone
Speakers/headphones
Headset [2]

3 Tick whether the following statements are **true** or **false**.

	true (✓)	false (✓)
WLAN stands for Wide Local Area Network.		
A WAN often requires the use of a router.		
The internet is a WAN.		
A LAN usually covers a smaller area than a WAN.		

[2]

3

	TRUE (✓)	FALSE (✓)
WLAN stands for Wide Local Area Network		✓
A WAN often requires the use of a router	✓	
The internet is a WAN	✓	
A LAN usually covers a smaller area than a WAN	✓	

4 correct answers – 2 marks
2 or 3 correct answers – 1 mark
1 correct – 0 marks

[2]

3   Tick whether the following statements are **true** or **false**.

	true (✓)	false (✓)
A WAN usually connects a number of LANs.		
A LAN is usually found in one building.		
A WAN is a Wireless Area Network.		
The internet is an example of a WLAN.		

[2]

3

	TRUE (✓)	FALSE (✓)
A WAN usually connects a number of LANs.	✓	
A LAN is usually found on one building.	✓	
A WAN is a Wireless Area Network.		✓
The internet is an example of a WLAN.		✓

4 correct answers – 2 marks
2 or 3 correct answers – 1 mark
0 or 1 correct answer – 0 marks   [Max. 2]

1   There are a number of different network devices associated with computers.

Give the most appropriate type of communication device that fits the following descriptions.

(a) This device connects a LAN to the internet.

....[1]

(b) This device transmits data to specific computers in a network.

....[1]

(c) This device broadcasts data to all computers in a network.

....[1]

(d) This device connects one LAN to another LAN that uses the same protocol.

....[1]

1 **(a)** Router/Broadband modem [1]

(b) Switch [1]

(c) Hub [1]

(d) Bridge [1]

5 The directors of a multi-national car company need to communicate with each other. They have decided that the best way to do this is through web-conferencing.

(a) Describe web-conferencing and how it could be used in this scenario.

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....[4]

(b) The directors wish to have a conference with their managers in other countries and are considering the use of video-conferencing.

Name **three** pieces of hardware that would be needed in order to hold a video-conference.

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2 ....

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3 ....

....[3]

(c) Describe **three** drawbacks of setting up and using video-conferencing.

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....[6]

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5 **(a)** **Four** from:

Real time collaboration/communication
Multiple users are connected to the internet.
See the same screen at all times in their web browsers
Allows: texting, for example of the car details
VOIP, for example, the delegates discussing the car range
Full motion video to show the car being test driven   [4]

(b) **Three** from:

Webcams/cameras
Large monitors/projector
Microphones
Speakers/headphone   [3]

(c) **Three** matched pairs from:

Power cuts/load shedding…
…can lead to parts of the video-conference shutting down.
Lip sync problems/time lag…
…this means that the picture is not running at the same speed as the sound.
Need to consider time zone implications of when to hold the video-conference…
…some participants may be video-conferencing outside of work hours/in the night.
Initial cost of hardware/software…
…expensive to buy extra hardware and software
Needs reliable internet access…
…otherwise the video-conference will suffer interference/break down of signal.
Difficult to stop them all talking at once/manage contributions…
…if more than one person talks at once it is difficult to hear what is said.
Difficult to manage the video-conference starts on time…
…due to time differences/setting up issues.
Difficult to keep participants on task…
…they are not in the same room so could be doing other things/not concentrating.
Increased cost/time of training staff…
…The host of the conference would need training/participants may need training.
Cost/time of technician/support staff…
…the support staff will need to be on hand in case of problems.
Document cannot be signed…
…there will be only one copy of the document.
Physical objects cannot be examined…
…this would need to be set up before the conference which takes time. [6]

8   Biometrics have replaced user IDs and passwords in a large number of systems.

Discuss the advantages and disadvantages of using biometric systems rather than more traditional security methods.

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....[6]

8 **Six** from:

Examples

Advantages
Biometrics are unique…
…so others cannot sign people in/whereas with password/card systems someone else can sign you in.
Fingerprints/eyes are always with you…
…but a password/card can be lost.
Cannot be forgotten passwords can be forgotten
The user has to be present therefore more secure.
Typing in passwords can lead to errors on data entry…
…biometrics tend to be more reliable.
More difficult to forge…
…passwords can be copied/cards can be stolen.

Disadvantages
Personal liberty infringement…
…fingerprints/biometric must be stored.
Method is slower to enter system than passwords.
Equipment and setup is more expensive than producing cards.
The time taken to set up a store of fingerprints/eye prints can be a long time…
…quicker to set up a database of passwords.
If the finger is damaged/dirty it cannot be read passwords can be more reliable.
If dark glasses are worn retina cannot be read passwords are more reliable
If a voice is not understandable on a voice recognition system may not work.
Facial hair can stop facial recognition passwords are more reliable

A mark can be awarded for a reasoned conclusion
If one side of the argument i.e. all advantages/disadvantages then 3 marks max.
If both sides have been addressed but without expansions/differences then 4 marks max   [6]

16 (a) Describe what is meant by an intranet.

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....[2]

(b) Describe what is meant by the internet.

....

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....[2]

16 (a) **Two** from:

Internal restricted access network/secure network
Uses same protocols as the internet
Private network
Used within an organisation eg school
Limited resources [2]

(b) **Two** from:

Public network/not policed
International network of networks
WAN/wide area network
World wide/global/international
Public information system
web/email/gophers/social networking/video conferencing is part of the internet [2]

10 There are several ways in which members of an organisation can organise meetings. These include video-, audio- or web-conferencing.

(a) An organisation is planning an important meeting with the Directors of the three main offices. They are going to set up an audio-conference.

Describe the process of setting up this type of conference.

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....[4]

(b) The organisation has a computer network which is connected to the internet. The router contains a firewall.

Explain why a firewall is needed.

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....[4]

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10 (a) Four from:

Agree the date and time of the conference

Either
Contact an audio conferencing provider …
…for organiser's PIN
…for participant's PIN
Give the PIN to each participant
at the start of the conference organiser types in his PIN
Each participant dials the number and enters the PIN

or
the organiser phones/contact the first participant
the organiser phones/contact subsequent participants
puts them on hold…
…until all participants have been contacted
joins the participants together/joins the conference [4]

(b) Four from:

It is needed for network security
It controls the incoming and outgoing network traffic.
A firewall establishes a barrier between a trusted, secure internal network and the Internet
It logs incoming and outgoing traffic
It stops malicious traffic
It prevents computers connecting to unwanted sites
It prevents untrusted/unrecognised computers accessing data on the system

15 **(a)** A router is connected to a LAN.

Describe the function of a router.

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....

....⭐..

....[2]

(b) Different methods can be used to connect computers to networks.

Describe **two** advantages for each of the following methods.

WiFi ....

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....⭐..

....[2]

Satellite ....

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....

....[2]

3G/4G ....

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....[2]

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15 **(a)** **Two** from:

Routers inspect/read the IP address of the data packets sent to it
Sends the data packet to a switch with that IP address
It may use the MAC address of the switch to do that by converting the IP to a MAC using ARP...
...until it finds the corresponding switch   [2]

(b) WiFi

Any **two** from:

Can connect to the internet from any room in a house
No cables
Can be used on multiple devices   [2]

Satellite

Any **two** from:

This is broadband
Useful for general use of the internet
(Connects via satellites so) better coverage
Can be used almost anywhere in the world   [2]

3G/4G

Any **two** from:

Used in mobile devices laptops/tablets/smartphones
Connects wireless through the 3G or 4G network
Allows access on the move
Allows access even if no WiFi available
Not affected by rain or snow as satellite communication   [2]

February/March2015/12

4   There are a number of different types of area networks.
     Tick whether the following statements apply to a WAN, LAN, or a WLAN.

	WAN ✓	LAN ✓	WLAN ✓
This type of network usually requires the use of WiFi			
Usually is cabled and often housed in a single building			
Covers a large area and is often connected using a router			
Requires the use of Wireless Access Points (WAPs)			

[4]

4

	WAN	LAN	WLAN	
This type of network usually requires the use of WiFi			✓	[1]
Usually is cabled and often housed in a single building		✓		[1]
Covers a large area and is often connected using a router	✓			[1]
Requires the use of Wireless Access Points (WAPs)			✓	[1]

10 Apart from security aspects, describe the role of a proxy server.

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.... [3]

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10 **Three** from:

Can act as a web server
Can act as a buffer between internet and LAN
Server passes on requests to the internet
Passes the requested web pages to individual computers
Can cache/store the webpages
Subsequent requests for that/those web page(s) are responded to more quickly
Can be used to monitor internet usage   [3]

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15 Many computer networks are connected using cables but some are now connected using wireless technology.

Discuss the advantages and disadvantages of using wireless networks compared to using cabled networks.

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.... [6]

15 Six from:

Advantages
Less likely to trip over cables
Easier to relocate computers
Cheaper as you don't have to buy cables
Adding devices/computers to network is easier

Disadvantages
Limited area of network
Strength of signal is weaker
Physical obstacles can interfere with signal/can cause disconnection

One mark is available for a reasoned conclusion.   [6]

8   Describe each of the following types of network.

LAN ....

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WAN...

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WLAN ....

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                                                                                                    [6]

8   LAN
     Two from:
     –   LAN is a Local Area Network
     –   LAN covers a small area/one building
     –   A school network is a LAN

     WAN
     Two from:
     –   WAN is a wide area network
     –   WAN covers a large geographical area/worldwide
     –   The Internet is a WAN
     –   A WAN consists of connected LANs

     WLAN
     Two from:
     –   WLAN is a wireless local area network
     –   Uses wireless technology to transmit data
     –   Uses Wireless Access Points (WAPs) connected to a wired network   [6]

9   Describe **four** items which can be provided by an ISP.

     1 ....

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     2 ....

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     3 ....

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     4 ....

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                                                                                    [4]

9   **Four** from:
     Access to the internet
     Email address
     Router to connect to the internet
     Domain name to have own website
     Email security software
     Web space to create own website
     Storage space to save data in the cloud
     DNS service to convert URLs to IP addresses
     Firewall to block unauthorised traffic   [4]

11   Explain why encryption is needed when transmitting data.

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....[3]

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11   **Three** from:

To cause data to be scrambled/encoded
Protects sensitive data...
...from being understood if it falls in to the wrong hands
Only user/computer with key can understand data   [3]

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17   Give **three** reasons why some companies have intranets.

1   ....

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2   ....

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3   ....

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                                                                                                                [3]

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17   **Three** from:

It is possible to prevent employees accessing undesirable websites
They can ensure that available information is specific to their needs
It is easier to make sure confidential messages stay within the company
There is less chance of company computers being hacked   [3]

6   Explain, using examples, what is meant by authentication techniques.

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.... [3]

6	**Three** from:
	Is a means of identifying yourself to a system
	Something you know such as PIN/password
	Something belonging to you such as a bank card
	Something unique about you such as a biometric feature [3]

10   Describe the differences in use between WiFi and Bluetooth.

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10	**Four** from:
	WiFi technology enables local area network…
	… and Internet connections
	Using WiFi, a laptop or desktop computer can connect to a network's wireless router
	Bluetooth connects two devices together
	Usually Bluetooth peripherals are powered by batteries that need to be charged or replaced
	WiFi covers a larger distance than Bluetooth
	WiFi requires more than ten times more bandwidth than Bluetooth [4]

(c) In order to make reliable information available to all students, schools often put the information on their intranet.

Describe what is meant by an intranet.

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.... **[4]**

(c) Four from:

An intranet is a computer network
Exists usually within one organisation/school
Meets the internal needs of an organisation/school
Can be expanded to become an extranet
Intranet is private
Intranets tend to be policed/managed
Intranet has an extra layer of security
Data found in an intranet is likely to be more relevant to the students' needs   **[4]**

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13 Most school computer networks have a router and switches.

(a) Explain what is meant by a switch.

1 ....

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2 ....

.... **[2]**

(b) Describe the purpose of a router.

1 ....

....

2 ....

.... [2]

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13 (a) Two from:
Switched hub
Has many computers connected to it
Can learn/store addresses of each computer in that part of the network
Can direct data to specific computers/devices [2]

(b) Two from:
Connects network/computers to the internet
Uses IP addresses
Transfers data between networks
Connects LANs/networks together [2]

---

15 A school wants to buy some new computers. Some of the computers they buy will be networked and others will be standalone computers which will not be networked.

(a) Describe **two** advantages of using networked computers.

1 ....

....

2 ....

.... [2]

(b) Describe **three** disadvantages of using networked computers.

1 ....

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2 ....

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3 ....

.... [3]

Eventually the school will use sets of networked Wifi laptops and cabled desktop computers which will also be networked.

(c) Discuss the advantages and disadvantages of using these laptop computers compared with using cabled desktop computers.

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.... [6]

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15 (a) Two from:
Fewer printers are needed
Fewer scanners are needed
Can access work from any computer
Data can be shared between computers/data can be accessed by one computer from another more easily
Software can be shared/updated more easily
All computers can access the internet /through one connection   [2]

(b) Three from:

Greater risk of hackers
Greater risk of viruses
The significant cost of extra equipment
When the network is down, cannot use network computers/can still use standalones
Print queues can be long   [3]

(c) **Six** from:
Advantages
Laptops can be transported from room to room more easily
Safer – won't trip over loose cables
Can use laptops outside the classroom if required
Can be used even if there's a power cut

Disadvantages
Laptops may be more expensive than network PCs.
Display is smaller
Laptops will need recharging periodically
Have to be in range of a network point

One mark available for reasoned conclusion
Must have at least one advantage and disadvantage to gain full marks [6]

10 A video-conference is being set up.

Complete each sentence below using the **most appropriate** device from the list.

MICR	**OCR**	router
web cam	**scanner**	printer
keyboard	**microphone**	speaker

  (i) Moving images are input using a

....

  (ii) Sound is input using a

....

  (iii) Sound is output using a

....

  (iv) Connection to the Internet is made using a

.... [4]

10 (i) Webcam

  (ii) Microphone

  (iii) Speaker

  (iv) Router [4]

19 People can access the Internet using mobile (cell) phones, laptops and their PCs.

Compare and contrast the use of these different devices to access the Internet.

....

....

....

....

....

....

....

....

....

....

.... [6]

---

19 **Six from:**
Mobile phones/laptops are portable, PCs are not
Keyboard on mobile phone is smaller/difficult to type
Mobile phone display is smaller than laptop or PC
Mobile phone may not be able to access certain sites
Signal is likely to be more reliable with PC/laptops as they can be cabled
Slower to access the internet with mobile phone
May not always be able to access the internet using a mobile phone or laptop
More likely to have a mobile phone with you
Can access the internet from greater number of places with a mobile phone
Easier to use a mobile phone while on the move
Some sites do not have full facilities for mobile phones   [6]

2   Identify **two** network devices.

1 ....

2 ....

[2]

---

2   **Two** from:
Bridge
Hub
Switch
Router
<u>Proxy</u> server
Network card   [2]

---

10 (a) (i)   Describe what is meant by a LAN.

....

....

....

....[2]

(ii)   Describe what is meant by a WAN.

....

....

....

....[2]

(b) Name an item of hardware that would be used to connect a LAN to a WAN.

.... [1]

10 (a) (i) **Two** from:
LAN is a Local Area Network
LAN covers a small area/one building
A school network is a LAN [2]

(ii) **Two** from:
WAN is a wide area network
WAN covers a large geographical area/worldwide
The Internet is a WAN
A WAN consists of connected LANs [2]

(b) Router/modem/cable [1]

16 (d) To prevent the customers' bank details being read by hackers, the bank uses encryption.

Explain what is meant by encryption.

....

....

....

....

....

.... [3]

(d) **Three** from:
Causes data to be scrambled/encoded
Requires an encryption key/software to encrypt
Requires a decryption key/encryption/key/software to decrypt
Results in data which is not understandable/readable
Protects sensitive data…
… from being understood if it falls in to the wrong hands [3]

9 A number of schools have Local Area Networks (LANs) in their buildings. The LANs are used to share software and for students to save their work.

(a) Describe **two** ways that students can prevent the work they save from being edited by others.

1 ....

....

2 ....

....

[2]

The schools want to connect their LANs to the Internet.

(b) Name the device they will need.

.... [1]

As a result of all the schools having access to the Internet, students will be able to communicate with students at other schools in a number of ways.

(c) Give **two** examples of these ways.

1 ....

....

2 ....

....

[2]

The headteachers of the schools will want to send confidential data to each other.

(d) Give **one** advantage and **one** disadvantage of encryption.

Advantage ....

....

Disadvantage..

....

[2]

9 (a) **Two** from:
Make their file/work read only
Password encrypt their file/work
Grant people access to their file/work without permission to edit
Make their file/work hidden   [2]

 (b) Modem/router   [1]

 (c) **Two** from:
Email
Instant messaging
VOIP
Video conferencing   [2]

 (d) Advantage
Unauthorised users won't be able to understand data/only person/computer with key can understand data

Disadvantage
The data can still be deleted/if the person encrypting the data accidentally deletes the encryption key the data will be unreadable   [2]

12 A large multi-national company uses video conferencing instead of face to face meetings between branches in different countries.

 (a) Apart from a keyboard, mouse and display devices, identify **two** other devices which **must** be present in such a system for a video conference to take place.

    1 ....

    2 ....
    [2]

(b) Describe **four** disadvantages of video conferencing.

    1 ....

    ....

    2 ....

    ....

    3 ....

    ....

    4 ....

    ....
    [4]

12 (a) **Two** from:
Router
Web cam
Microphone
Network card
Speakers [2]

(b) **Four** from:
Takes time/costs money to learn new technology/to be trained
Difficult to have international meetings because of time differences
Initial cost of hardware (and software)
Equipment can break down/power cuts can stop conference
Poor strength of signal/time lag/lip sync can be a problem/connection can be lost
Loss of personal/social contact [4]

14 Describe the differences between an intranet and the Internet.

....

....

....

....

....

....

....

.... [4]

14 **Four** from
Internet is network of networks/intranet doesn't have to be a network of networks
Internet is global
Intranet is within one organisation
Intranet is private/internet is public
Intranets tend to be policed/managed
Intranet has an extra layer of security
Data found in an intranet is likely to be more reliable/relevant than that found on the Internet
Internet has more information than an intranet [4]

16 Describe **three** ways in which personal data held on computers can be misused. For each way explain a different method for helping to prevent it.

Way 1 ....

....

Method 1 ....

....

Way 2 ....

....

Method 2 ....

....

Way 3 ....

....

Method 3 ....

....

[6]

---

16 **Three** matched pairs (with a different method for each one) from:
Data could be amended
Use a username and password so that only the person who knows these can access the data
Use biometrics so that only that person who has those characteristics can access the data
Use a firewall which prevents unknown computers accessing a network

Data could be deleted
Use a username and password so that only the person who knows these can access the data
Use biometrics so that only that person who has those characteristics can access the data
Use a firewall which prevents unknown computers accessing a network

Data could be read and passed on
Encryption so that data is unreadable to unauthorised users   [6]

9 Tick **True** or **False** next to each statement.

	True	False
Using a password always prevents unauthorised access to data.		
A strong password is one that is difficult for a hacker to guess.		
Giving your password to a friend is a good idea in case you forget it.		
If you forget your user ID you can still gain access to data using your password.		

[4]

9

	True	False
Using a password always prevents unauthorised access to data		✓
A strong password is one that is difficult for a hacker to guess	✓	
Giving your password to a friend is a good idea in case you forget it.		✓
If you forget your user id you can still gain access to data using your password.		✓

[4]

17 The head teacher of a school is concerned that students may be hacking into the exam scores database to change their marks.

Other than passwords, describe ICT methods that could be used to prevent this from happening.

....

....

....

....

....

....

....

.... [4]

17 **Four** from:

Biometric methods – unique so only authorized users will have access
Encryption makes it difficult for unauthorised users to read data
Firewall – makes it difficult for unauthorised computers to access the system
Disconnect records computer from network – limit access physically
Access levels – only users with appropriate permissions can access data   [4]

4   Tick **four** devices which are used to connect networks together.

	✓
Hub	
Printer	
Bridge	
Router	
Scanner	
Passwords	
Monitor	
Switch	

[4]

4

	✓
Hub	✓
Printer	
Bridge	✓
Router	✓
Scanner	
Passwords	
Monitor	
Switch	✓

[4]

16 A small business wishes to set up a Local Area Network (LAN). The manager is not sure whether to use cables to connect the computers or use wireless technology.

Give **three** disadvantages of using wireless technology.

1 ....

....

2 ....

....

3 ....

.... [3]

16	**Three** from:
	Limited area of network
	Strength of signal is weaker
	Easier to hack into/less secure
	Physical obstacles can interfere with signal/can cause disconnection [3]

17 Describe **four** differences between an intranet and the Internet.

1 ....

....

2 ....

....

3 ....

....

4 ....

.... [4]

17 Four from:

Internet is network of networks/intranet doesn't have to be a network of networks
Internet is global
Intranet is within one organisation
Intranet is private/Internet is public
Intranets tend to be policed/managed
Intranet has an extra layer of security
Data found in an intranet is likely to be more reliable/relevant than that found on the Internet
Internet has more information than an intranet   [4]

14 Mobile phones (cellphones) are used for accessing the Internet.

Give **two** advantages and **two** disadvantages of using a mobile phone rather than using a desktop computer to access the Internet.

Advantage 1 ....

....

Advantage 2 ....

....

Disadvantage 1 ....

....

Disadvantage 2 ....

                                                                                              [4]
....

14 Two advantages from:

Easy to carry/are portable
Usually have mobile phone in your possession
Can access Internet almost anywhere
Can access Internet on the move   [2]

Two disadvantages from:

Easily lost
May have poorer signal
Display is smaller/keyboard is smaller
Content is more limited
Can be slower to access Internet
Batteries might run out
No mouse so can be more difficult to navigate   [2]

16 School networks often contain a router and a proxy server.

(a) Describe the role of a proxy server in such a network.

....

....

....

....

....

.... [3]

(b) Explain the purpose of a router.

....

....

....

....

....

.... [3]

16 (a) **Three** from:

Can act as a web server
Can act as a buffer (between Internet and LAN)
Server passes on requests to the Internet
Passes the requested web pages to individual computers
Can cache/store the webpages
Subsequent requests for that/those web page(s) are responded to more quickly
Can be used to monitor Internet usage
Can block certain sites   [3]

(b) **Three** from:

Connects a LAN to a WAN
Connects a LAN to the Internet
Forward data packets to the individual computers on a network
Hold the addresses of each computer on the network   [3]

6   As well as PCs, mobile phones (cellphones) can be used to access the Internet.

   (a) Give **two** advantages of using a PC rather than a mobile phone for this purpose.

   1 ....

   ....

   2 ....

   .... [2]

(b) Give **two** disadvantages of using a PC rather than a mobile phone for this purpose.

   1 ....

   ....

   2 ....

   .... [2]

---

6   **(a)** **Two** from:

   Less likely to lose it
   May have stronger signal
   Display is larger/keyboard is larger
   Content is not as limited
   Can be faster to access internet
   No problem with batteries running out
   Has a mouse so is easier to navigate/use   [2]

   (b) **Two** from:

   Don't always have access to PC/there may be a power cut
   Difficult to carry/not very portable/mobile phone is portable/Cannot access internet except in
   the house
   You have to buy extra hardware/router   [2]

---

7 Tick **Internet** or **intranet**, next to each statement, as appropriate.

	Internet	intranet
is a network of computer networks		
exists usually within one organisation		
anybody can access it		
can be expanded to become an extranet		

[4]

7

	Internet	Intranet	
is a network of computer networks	✓		[1]
exists usually within one organisation		✓	[1]
anybody can access it	✓		[1]
can be expanded to become an extranet		✓	[1]

5 Name and describe **three** ICT methods which could be used to help prevent illegal access to computer networks.

1 ....

....

....

....

2 ....

....

....

....

3 ....

....

....

.... [6]

5 **Three** matched pairs from:

User ID and one of password/PIN/Memorable data

Password/PIN/Memorable data has to be entered before access is gained/Password/PIN can be changed frequently to avoid hackers guessing them/Unsuccessful logins can throw you out of the system

Magnetic stripe/smart card/electronic key/bar code system/ID card

Has to be read before access is gained/Prevents people without cards accessing system

Biometric data

Fingerprint/retina/iris/face/voice recognition used as input/Biometric data is difficult to replicate/is used because it is unique/compared with those stored on the system

Firewall

Only allows known computers to access network/prevents unknown computers accessing network
[6]

9 Describe, including the uses of the hardware and software, what is meant by video conferencing.

....

....

....

....

....

....

....

....

....

.... [5]

9 **Five** from:

Video conferencing is a method of visual and audio communication between people at separate locations
Webcams/small video cameras are used to input faces of participants
Large monitor/projector to output faces of participants
Microphones are used to input voices of participants
Speakers are used to output voices of participants
Router/broadband modem used to connect to internet
Video conferencing software needed to link participants
Employees are connected on-line/may need to access the Internet/WAN to work
Images of the employees appear on the screen in real time
Software is needed in each computer to operate the conference
Employees can be heard by all the other employees in the conference
You can take part wherever you are   [5]

7 Multi-national companies often use video conferencing instead of face-to-face meetings.

(a) Tick **three** advantages of video conferencing.

	✓
Companies do not have to buy any equipment	
Companies can arrange the meeting for any time of day	
It is safer as employees do not have to travel	
Companies do not have to pay hotel expenses	
Employees don't have to carry so many documents with them	
Employees are paid less	

[3]

(b) Tick **three** disadvantages of video conferencing.

	✓
Video conferences can only last a short time	
Employees are unable to see who they are talking to	
It is difficult to call international meetings because of time differences	
There is sometimes a time lag between video and sound	
It is difficult to share documents	
Legal documents may need to be signed	

[3]

7 (a)

Companies do not have to buy any equipment	
Companies can arrange the meeting for any time of day	
It is safer as employees do not have to travel	✓ **[1]**
Companies do not have to pay hotel expenses	✓ **[1]**
Employees don't have to carry so many documents with them	✓ **[1]**
Employees are paid less	

(b)

Video conferences can only last a short time	
Employees are unable to see who they are talking to	
It is difficult to call international meetings because of time differences	✓ **[1]**
There is sometimes a time lag between video and sound	✓ **[1]**
It is difficult to share documents	
Legal documents may need to be signed	✓ **[1]**

5   Name **three** network devices and for each one describe what it does.

Name ....

Description ....

....

Name ....

Description ....

....

Name ....

Description ....

.... **[6]**

5 **Three** pairs from:
Hub
Broadcasts data packets to computers in a LAN

Router
Connects LANs to a WAN/Internet

Switch
Directs data packets to specific computers

NIC
Enables computers to be connected to a network

Bridge
Connects networks/LANs together/Directs data packets to specific networks

Proxy server
Stores web pages for faster re-use by computers/can act as a firewall

Modem
Modulates data and demodulates phone signals [6]

6

	LAN	WLAN
Uses wireless technology to transmit data		✔
Faster transmission of data	✔	
Greater security	✔	
Is cheaper as there is less cabling		✔

[4]

6

	LAN	WLAN
Uses wireless technology to transmit data		✔
Faster transmission of data	✔	
Greater security	✔	
Is cheaper as there is less cabling		✔

[4]

14 A bank is looking into a variety of security measures to protect its customers' data.
    Describe **three** types of authentication technique they could use and for each give a be
    and a drawback.

    Technique 1 ....

    ....

    Benefit ....

    ....

    Drawback ....

    ....

Technique 2 ....

....

Benefit ....

....

Drawback ....

....

Technique 3 ....

....

Benefit ....

....

Drawback ....

.... [9]

14 **Three** matched triples from:

User ID and password
Benefit – each user ID could be unique/only user will know the password/data can only be accessed by person who knows the password/Password can be changed frequently to avoid hackers guessing them/Unsuccessful logins can throw you out of the system
Drawback – user might forget password/keylogging software can be used to intercept it

Biometrics
Benefit – each user has unique biometrics
Drawback – equipment is expensive to buy/may be difficult or expensive to get equipment to user

Magnetic/chip card with PIN
Benefit – Hacker needs to have the card and know the PIN
Drawback – can lose the card/can forget PIN

TAN
Benefit – Always changing so a hacker would not be able to use it even if they intercepted it when user typed it in.
Drawback – need to have card and remember PIN and use it within a short period of time.   [9]

14 Mobile telephones (cellphones) are used for accessing the internet.
Give **two** advantages and **two** disadvantages of using a mobile telephone rather than using a laptop computer to access the internet.

Advantage 1 ....

....

Advantage 2 ....

....

Disadvantage 1 ....

....

Disadvantage 2 ....

.... [4]

14 **Two** advantages from:
    More likely to have it with you
    Can access internet from greater number of places
    Easier to use while on the move

    Two disadvantages from:
    Display is more difficult to see/display screen is smaller
    Keyboard is smaller so more difficult to type
    Some sites do not have full facilities for mobile phone   [4]

16 Describe what a virus is and what effect it may have on the data on a hard disc.

    ....

    ....

    ....

    ....

    ....

    .... [3]

16 **Three** from:
    A piece of program code
    Which replicates itself
    Fills up hard disc making it unusable
    Deletes data/changes data (from hard disc)
    Makes software/operating system unusable   [3]

8   Tick **True** or **False** next to each statement describing encryption.

	True	False
Encryption prevents hackers from understanding the data.		
Encryption destroys viruses.		
Encryption prevents unauthorised access to computer systems.		
Encryption is the scrambling of data.		

                                                                               [4]

8

	True	False
Encryption prevents hackers from understanding the data	✓	
Encryption destroys viruses		✓
Encryption prevents unauthorised access to computer systems		✓
Encryption is the scrambling of data	✓	

[4]

11 A manager of a new company has just purchased some computers. She wishes to connect these computers together to form a LAN.
Name and describe **three** network devices she might need to have in order to achieve this.

Device 1 ....

Description ....

....

Device 2 ....

Description ....

....

Device 3 ....

Description ....

[6]
....

---

11 **Three** matched pairs from:

Hub
Broadcasts data packets to computers in a LAN

Switch
Directs data to specific computers

Bridge
Connects two LANs together to form a larger LAN/Directs data packets to specific networks

NIC
Enables computer to be connected to a network   [6]

---

14 Schools are concerned with the possibility that students are using the schools' internet connections to access undesirable sites.

Name and describe **two** security methods the schools could use to prevent this from happening.

Method 1 ....

Description ....

....

Method 2 ....

Description ....

[4]
....

---

14 **Two** matched pairs

Proxy server
The proxy server can restrict the web sites students can access/can block access to sites with objectionable material

Firewall
Limits the computers (using IP address) that can access the system/that can be accessed from within the school

Applying parental guidance settings.
Can block undesirable topics   [4]

---

6   Ali wants to back up his data.

(a) Give **two** reasons why making backups is necessary.

1 ....

....

2 ....

.... [2]

(b) Ali thinks that making backups will prevent his data from getting viruses.
Describe what a virus is and explain why Ali is wrong.

....

....

....

....

....

.... [3]

---

6   (a) **Two** from:

Data could be corrupted on original medium
Data could be accidentally amended/overwritten on original medium
Data could be accidentally deleted from original medium
Data could be maliciously deleted from original medium   [2]

(b) **Two** from:

Virus is a piece of programming code
Which replicates itself...
Can fill up storage medium making it unusable
Deletes data/change data
Makes software/operating system unusable   [2 max]

If the original medium has a virus the backup will have it as well/backup will have no effect on
the hard disc so it is still susceptible to viruses   [1]

10 Describe the benefits and drawbacks to companies of using video conferencing.

....

....

....

....

....

....

....

....

.... [5]

---

10 **Five** from:

Benefits:
Can call meeting at short notice
No need to pay travelling expenses
Can work from home
Employees will save time travelling
Do not have to pay hotel expenses
Do not have to pay for conference room facilities
Safer as participants do not have to travel
Don't have to transport/carry equipment/lots of documents/documents don't get lost in transit

Four max.

Drawbacks:
Takes time/costs money to learn new technology/to be trained
Difficult to have international meetings because of time differences
Initial cost of hardware (and software)
Equipment can break down/power cuts can stop conference
Poor strength of signal/time lag/lip sync can be a problem/ connection can be lost
Loss of personal/social contact
Legal documents cannot be signed

Four max. [5]

6   Name **three** items of hardware, other than a PC, needed to conduct a video conference.

1   ....

2   ....

3   ....   [3]

---

6   **Three** from:

Projector/large screen
Webcam/video camera
Speakers/headphones
Microphone
Router/modem   [3]

---

9   Aftab owns a company which has a small number of computers. He wants to connect the computers into a network. He does not wish to connect the computers to the internet but he does want the workers to be able to communicate within the company.

(a) Name a network device used to connect the computers together.

....   [1]

(b) Name an item of software used to send messages between the computers.

....   [1]

(c) What is the name given to this type of network?

....   [1]

(d) Give **three** reasons why Aftab may not want his workers to access the internet.

1   ....

....

2   ....

....

3   ....

....   [3]

9 (a) Hub/switch/bridge [1]

(b) Email software/IM software [1]

(c) LAN/intranet [1]

(d) Three from:

They may waste time playing games/going on social network sites/updating their blog/ online shopping/banking/surfing
They could access undesirable sites
They could download viruses/malware
Could make the company susceptible to hackers [3]

2 Ring **two** network devices.

CD RW	**hard disc**	**hub**
PIN	**plotter**	**switch**

[2]

2 CD RW hard disc (hub)

PIN plotter (switch) [2]

11 Many banks offer internet banking. To access this online service customers have to to the system.

(a) Explain why authentication techniques are necessary.

....

....

....

....

....

.... [3]

(b) Customer data is encrypted. Explain what encryption is and why it is used.

....

....

....

....

....

.... **[3]**

---

11 (a) Three from:

Authentication techniques such as user names and passwords identify the user to the system
Without authentication anybody would be able to access data
Hackers would be able to amend/delete data without being prevented
Would have to rely on other methods such as firewalls to prevent unauthorised access.   **[3]**

(b) Three from:

Causes data to be scrambled/encoded
Requires an encryption key/software to encrypt
Requires a decryption key/encryption software to decrypt
Results in data which is not understandable/readable
Protects sensitive data…
… from being understood if it falls in to the wrong hands   **[3]**

---

16 Some mobile telephones (cell phones) can be used to make video calls.
Describe **four** advantages of making video calls rather than sending messages by email.

1 ....

....

2 ....

....

3 ....

....

4 ....

.... [4]

---

16 Four from:

You get immediate feedback
You know you have the right person/don't have to worry that you've got the wrong email address
You can ask questions immediately based on feedback/carry out an interactive conversation
Less impersonal/less risk of upsetting recipient
Can make yourself understood more easily
You can see the other person's reaction   [4]