



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA



JUNE EXAMINATION INFORMATION TECHNOLOGY PAPER 2 GRADE 11

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DATE: 23 – 06 - 2015

MARK: 150

DURATION: 3 HOURS

NAME OF LEARNER:

GR.DIV

INSTRUCTIONS TO CANDIDATES:

1. Ensure that this paper contains 6 questions on 11 pages.
2. Answer all questions.
3. Number your answers exactly as the questions are numbered.

Scenario:

A recently opened charity organization (**Hands Of Compassion**) requires some assistance in upgrading their facilities and guidance as they make their shift into the world of ICT. As their personnel and funding is growing, they need to upgrade themselves into efficiently using modern forms of communication such as the internet and e-mail, etc. They require your assistance in the following regard:

- Setup a computer for simple data capture, minor calculations drawing up schedules, reports, and typing correspondence letters.
- Advise on issues such as setting up a local network as well as establishing a network system between the branches.
- General housekeeping rules when using computers.
- Connecting to, maintenance, protection and modern standards of the internet.

QUESTION ONE – { Multiple Choice }

Write down the letter of the alternative that best matches the statement or question above it.

1.1. _____ is non-volatile memory that can be used as secondary storage.

A) SRAM

B) DRAM

C) Flash memory

D) Cache memory

1.2. Firewire is ...

A) becoming the preferred method to connect almost any peripheral to a computer.

B) the best data connection to use for capturing a digital video.

C) a parallel communication standard which allows devices to transfer data at high speeds.

D) software that prevents unauthorised access to a network.

1.3. Validation is ...

A) the process of checking if data satisfies a given criterion.

B) not necessary for data input.

C) the process of normalising a database.

D) used to prevent errors in a spreadsheet when data is imported from a database.

1.4. A software program that records what you type on the keyboard or the mouse clicks you make is called a...

A) worm

B) honeypot

C) keylogger

D) cookie

1.5. A digital signature ...

A) works on the basis of a public key which is available to all and a private key which is available only to the customer.

B) is any handwritten identification which has been scanned into digital form.

C) is the electronic identification logo which is unique to a specific item of hardware.

D) is the software used by the IEEE to verify members' personal details.

P.T.O. PAGE 3 OF 10...1.6. An internal bus...

1.6. An internal bus ...

- A) is a serial cable which is used to connect the CPU to external ports.
- B) connects printers to stand-alone PCs.
- C) stores the results of calculations performed in the CPU.
- D) comes in several types, such as data, instruction or address.

1.7. Which operating system has been designed specifically to work on a cellphone?

- A) Android
- B) Solaris
- C) Windows Vista
- D) Linux

☐ 1.8. A UPS ...

- A) is used to provide limited alternative power in the event of a power failure.
- B) stands for Universal Power Supply.
- C) is a type of connector that is used for keyboards.
- D) is used to connect two networks.

1.9. The fetch/execute cycle ...

- A) is used in database management systems to process queries.
- B) is used to show how instructions are processed at a low level in the computer.
- C) enhances the performance of RAM by fetching the next memory location before the current one is processed.
- ☐ D) describes how a program translator deals with lines of program code.

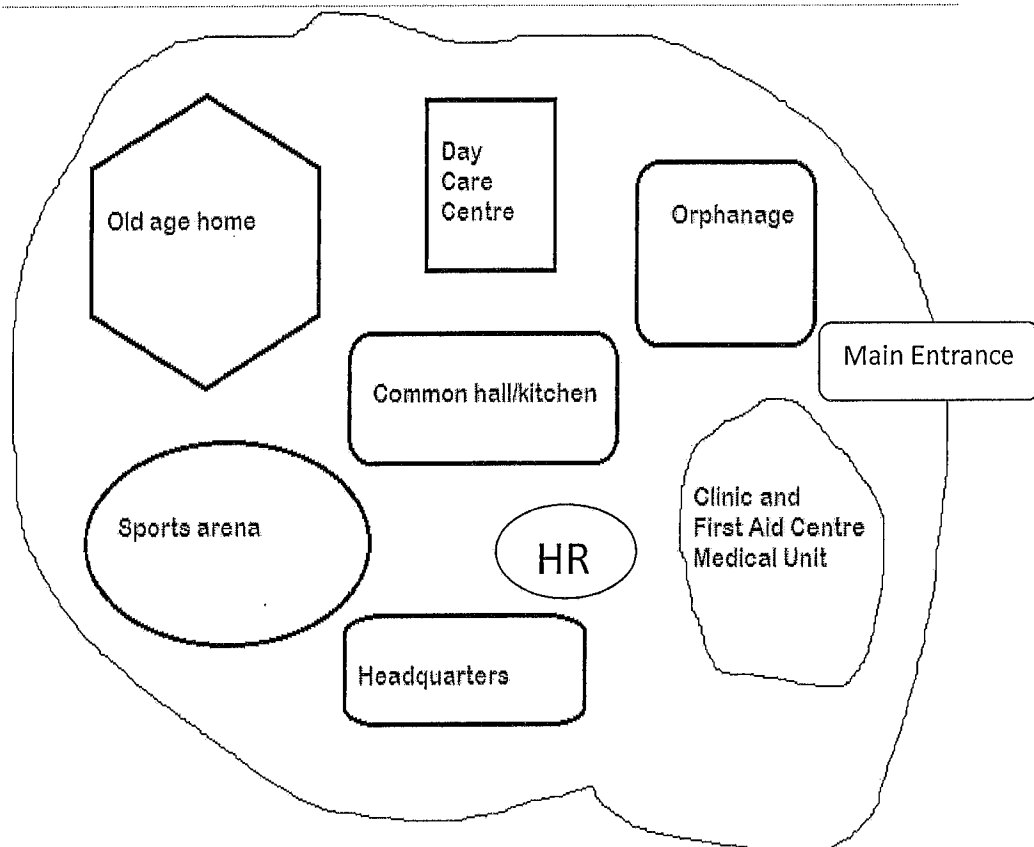
1.10. An example of full-duplex mode is ...

- A) a hand-held radio, where the user usually says 'Over' when he/she has finished talking and wants to hear what the other person says.
- B) a telephone conversation that occurs between two people.
- C) a school intercom in operation when the school secretary makes the morning announcements.
- D) an operating system communicating with a printer. [20]

p.t.o. Page 4 of 10\... QUESTION TWO...

QUESTION TWO

HOC has many different centres that have been set up on a large mass of land that are some distance apart. All the computers in each of the centres are linked to a server in the head office, situated at the entrance of the organization.



Your expertise in I.T. is required to help the administration manager, Mr. Michael Mercy, to solve hardware software and network-related problems.

2.1. The chipset is an integral part of the design of a computer.

2.1.1. Briefly describe the primary function of the chipset. (2)

2.1.2. The following devices must be connected to the chipset. For each device indicate whether it will be connected to either the north bridge or the south bridge.

- a) USB (1)
- b) PCI Express (1)
- c) Network card (2)

2.2. The performance of the CPU should be optimised to ensure a high performance computer system.

P.t.o. 2.2.1. Explain...

2.2.1. Explain the role that cache plays in the performance of a CPU. (2)

2.2.2. CPU's are often over-clocked to increase performance.

a) What is meant by over-clocking a CPU? (2)

b) Explain why over-clocking is often confused with clock multiplication. (2)

2.2.3. An alternative method to increasing the performance of a computer is to use a **hyperthreading** multiprocessor. If you could choose only one (either hyperthreading or **multiprocessing**) which one would you prefer to produce the highest increase in performance? Justify your answer by first defining each of these terms. (2)

2.3. Mr Mercy has been advised to replace the RAM of the computer in order to enhance its performance.

a) How will you ensure that the new RAM is compatible with the current motherboard? (2)

b) Some of the staff are of the opinion that if there is enough virtual memory, there would be no need to upgrade the RAM.

(i) Explain what virtual memory is. (2)

(ii) Explain why virtual memory will not be the solution to better performance. (2)

c) The statement "Upgrading RAM means more cache memory is available" was made. Give two reasons why this statement is not true. (2)

2.4. The server at the main office has to be replaced. Give two reasons why a server is better suited to ensure high performance rather than a regular PC. (2)

2.5. Mr Mercy has bought a new device to record the number of visitors to the park. The device is situated at the entrance and is given to him at the end of each day. Using the device, he wants to download the information about the number of visitors each day onto his computer.

2.5.1. When he inserts the device, the computer will be alerted that a new device has been plugged in. What is the name of the message to the CPU that a new device has been inserted? (2)

P.t.o. 2.5.2. This device is...

- 2.5.2. This device is hot swappable. Explain how the operating system will recognise a new device. (4)

Question Two [30marks]

QUESTION THREE

- 3.1. Mr Mercy wants to link all the centres using a network. Each centre has its own network (LAN) and their own administration offices. Which type of cable would you use to combine all the separate LAN's? Give two reasons for your answer. (3)
- 3.2. What LAN architecture/technology should he use. State the **topology**, and media access method he should choose, for this technology. (3)
- 3.3. What devices should he use to perform the following functions?
- 3.3.1. Connect all computers in the LAN. (1)
 - 3.3.2. To connect all centres to the internet. (1)
 - 3.3.3. To reduce the network traffic between the head-office and the main entrance. (1)
- 3.4. Mr Mercy has been sponsored portable tablets and he wants to make use of them by hiring it to visitors to HOC. On these tablets, visitors may be able to view all the details of each centre, individuals residing at the different centres, a map of the organization, which shows exactly where a visitor is and directions to where they wish to go. Mr Mercy has been informed that for this to happen, he needs the entire area of the institution to have wireless access.
- 3.4.1. What is the network device to use to provide wireless across the entire organization. Give two reasons for your answer. (3)
- 3.4.2. Explain why Bluetooth is not feasible to setup a wireless network in this instance? (2)
- 3.5. List two wireless technologies that can be used in this organization. (2)
- 3.6. Mr Mercy heard somebody speak of a "Hot Spot". Explain this term. (2)
- 3.7. State two disadvantages of a wireless network. (2)

P.t.o. QUESTION FOUR

[20]

QUESTION FOUR

Mr Mercy wants to create an interactive web site where visitors can view all activities in the entire organisation online during the day.

- 4.1. Should he create a Web 1.0 or Web 2.0 web site? Give a reasons for your answer. (2)
- 4.2. List two plugins he can expect a user to have installed on their browser to be able to view the videos and download audio files. (2)
- 4.3. Mr Mercy has heard about VOIP and thinks this is something he could use as it is free. Explain the meaning of VOIP to him. (2)
- 4.4. Mr Mercy wants to upload pictures of all the centres and he is not entirely convinced about the large size of these picture files. He has heard about "compressing the image file" and is a bit confused. (2)
- 4.4.1. What compression techniques would you suggest for images? (1)
- 4.4.2. What compression technique would you suggest for video? (1)
- 4.5. Mr Mercy was excited that he has cookies in his computer until he heard that cookies cause viruses. Explain to him why the statement above is incorrect? (2)

[10]

SOLUTION DEVELOPMENT

QUESTION 5

- 5.1 *Looping structures are often used in programming when the need arises. There are generally two types of loops, namely conditional and unconditional loops*

- 5.1.1 In programming terms what is a loop? (2)
- 5.1.2 Mention an example of an unconditional loop (1)
- 5.1.3 Under which conditions, would it be more preferable to use an unconditional loop, rather than conditional loop (2)

5.2

Enter Size of pizza (L/M/S)

No of extra toppings

No required

Amount Due

Exit

Consider the GUI screen below, developed for a Pizza parlour to capture telephonic orders.

Component A

- 5.2.1 State two improvements that can be made to this GUI design, that would enhance its' usability. (2)
- 5.2.2 State one shortcoming of using component A, to enter the size of the pizza. (1)
- 5.2.3 State TWO other possible GUI components that would be more suitable to use in this instance. (2)

5.3 **AZTours** would like to create an application that would input details of their clients. The following class called Tour is suggested:

Tour	
-	tourRef name dateOfTour destination
+	Tour() Tour(tourRef,name, destination) getName() getDateOfTour() getDestination() setDestination() toString()

- 5.3.1 What is the purpose of a constructor in a class? (1)
- 5.3.2 Identify and explain the differences between the two types of constructors shown in the class diagram. (3)
- 5.3.3 Which one of the methods in the class is declared incorrectly? Explain how this should be corrected. (2)
- 5.3.4 Which methods of the class would you use if you wish to:
- display the details of an instantiated object
 - change the destination for a client
 - instantiate an object
 - retrieve the destination
- (4)

5.4. Consider the following algorithm which determines if a number is prime or not and answer the questions that follow :

```

1. read num
2. count ← 0
3. countFact ....
4. loop num times
5. inc(count)
6. if ... (a) ..... then
   ... (b) .....
7. end loop
8. if countFact = 2 then
   print ... (c) .....
   else
   print ... (d) ...

```

- 5.4.1 Explain the purpose of the following counters in the algorithm:
- a) *count* (2)
 - b) *countFact* (2)
- 5.4.2 Complete the initialisation in line 3 (1)
- 5.4.3 Complete the rest of the algorithm(a- d) (5)

[30]

INTEGRATED SCENARIO

QUESTION 6

- 6.1 *Recently, a security company received an e-mail from an unauthorized source requesting the security password for the building. According to the e-mail, one of their employees had to urgently collect important documents from the building and he had forgotten the password.*
- 6.1.1 Which term is used when an unauthorised source uses an e-mail to try to convince someone to provide security-related information? (1)
 - 6.1.2 A link in the e-mail navigated the user to a web page that looked almost exactly like that of the security company. What is this type of communication scam called? (1)
- 6.2 *Fingerprint readers are used for authorized access in many companies.*
- 6.2.1 What is technology such as a fingerprint reader called? (1)
 - 6.2.2 Name TWO other examples of this type of technology that could also be used. (2)
- 6.3 *A database was planned and created by the database administrator at the your school. The data on all the educators and learners were entered into the database tables. All the educators have access to the database.*
- 6.3.1 Explain the difference between *data* and *information*. Use examples as part of your answer. (3)
 - 6.3.2 Explain why record-locking is necessary when different educators/ staff are working on the same table in a database. (2)

6.3.3 Besides planning and creating a database, name TWO other tasks

that a database administrator has to perform as part of his/her duties. (2)

6.4 *Caution must be exercised when using Wi-Fi Internet access in public places such as coffee shops, airports and shopping malls, because malicious people can intercept their data when it is transmitted.*

6.4.1 What is *Wi-Fi*? (1)

6.4.2 Name TWO types of devices that are able to make use of Wi-Fi. (2)

6.4.3 Explain why connecting to a Wi-Fi network does not necessarily mean you will have *free* Internet access. (2)

6.4.4 Which term is used to refer to the practice of intercepting data packets on a network? (1)

6.4.5 For EACH of the following technologies, state whether or not it is able to protect your data from being intercepted and used. Clarify your answer in

EACH case:

(a) Firewall (2)

(b) Encryption (2)

(c) Virus scan (2)

6.4.6 You decide it is safer not to use any Wi-Fi networks. Suggest an alternative Internet connection which is portable and can be used almost anywhere. (1)

6.5 Due to the increasing availability of online information, such as travel blogs and forums, the tourism industry might find itself out of business.

6.5.1 Define a *travel blog*. (2)

6.5.2 Give TWO examples of how ICT can be used to assist potential travellers in planning and organising their own holiday trips. (2)

6.6 A pamphlet received from a Mike's Game Reserve contained the following information:

98,9% of all tourists who visited South Africa in 2010 during the Soccer World Cup visited Mike's Game Reserve.

Someone queried this statistic, believing it to be incorrect. State THREE ways of verifying the trustworthiness of data/information. (3)

6.7 ADSL or a 3G Internet connection...

6.7.1 Expand the acronym 3G. (1)

6.7.2 State TWO possible problems that could occur when using a 3G connection. (2)

6.7.3 ADSL is an asymmetric service. Briefly explain what *asymmetric service* means. (1)


6.8 In a recent sporting event in South Africa, one of the organisers stumbled upon information on a social media website indicating that a specific athlete used a banned substance.

6.8.1 Give an example of a social media website that could have been used to publish this information about the athlete. (1)

6.8.2 Is the organiser allowed to act upon this information? Motivate your answer. (2)

6.8.3 It was established that the profile does not belong to the athlete implicated. What kind of computer crime was committed against the athlete in this case? [1]

[40]

GREENBURY SECONDARY SCHOOL
DEPARTMENT OF MATHS & SCIENCES
H.O.D. MR L. PILLAY


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GRADE 12 PAPER 2 – MEMO(JUNE 2015)

Question one

- 1.1.D 1.2.B 1.3.B 1.4.B 1.5.A 1.6.A 1.7.C 1.8.D 1.9.C 1.10.C

QUESTION TWO

2.1.1. A chipset is a set of instructions that can be interpreted and executed by the CPU. Also allows for communication between the components and the motherboard.

- 2.1.2. a) Northbridge b) Southbridge c) Southbridge

2.2.1. Stores the next instruction to be processed by the CPU. Speeds up processing.

2.2.2. a) Reduced instruction set computing. Instructions are many basic ones.

b) Complex instruction set computing. One complex instruction interpreted by CPU.

2.2.3. Hyperthreading – more than one set of registers on CPU allows fast switching. Dualcore processor is able to execute superscalar processing by each core.

Multiprocessing – many processes split task. No need for switching, is better.

2.3. a)

Step1	A						Instruction A in first stage of processing
Step2	B	A					Instruction A and B being processed
Step3	C	B	A				
Step4	D	C	B	A			
Step5	E	D	C	B	A		

b) Two pipelines in a single processor.

2.4. (i) Fast access area on disk that acts as an extension to RAM.

The CPU is allowed to access secondary memory as if it were RAM.

Fools the computer into believing that there is more RAM than there actually is.

QUESTION FOUR [Integrated Scenario Question]

4.1. The organisation has received an anonymous sponsorship to install a complete security system with surveillance cameras in strategic areas for security purposes and 24 hours armed response. The president of the organisation has some concerns about accessing sensitive surveillance data, the storage and backup process as well as copyright of video material.

4.1.1. What do you understand by the term Copyright? (1)

Copyright is a law that protects the intellectual property of and individual/author or company.

4.1.2. State one reason why the video surveillance data should be copyrighted.(1)

In the event that someone makes copies of these videos with malicious intent, the organisation would have legal grounds to charge the individuals concerned with making copies.

4.1.3. Do you think that the video surveillance at the organisation will infringe on the privacy of staff and residents? Explain why you think so. (2)

No. The cameras are for security purposes and the staff, and residents should be made aware of camera locations.

4.2. The orphanage has a eighty teenagers between 13 -18 year age groups. They have created their own website. This website contains resources for careers, informative videos for download and teenage related articles on health, education and safety issues. The orphanage decided to host their website on their own server at the centre ensuring they are in control of the server at all times.

4.2.1. What is a web server? (1)

A web server(sometimes called HTTP server or application server) is a program that serves content using HTTP protocol.

1.2.2. What software is required for the server to host a website? (1)

Web server software eg Apache HTTP ; Abyss

1.2.3.Explain why the orphanage will still require an account with an ISP even though they are hosting their own website. (2)

Without an ISP account there would be no connection to the internet.

4.2.4. When another computer on the internet makes a request for information from the website on the orphanages server, what protocol is used to transmit this data? State fully. (2)

HyperText Transfer protocol

4.3. The IT technician at the orphanage has chosen The URL <http://www.hocyoungsters.org.za>.

4.3.1. If you visit the login page for this website, you will see 'https' instead of 'http'. Explain what this means. (2)

HTTPS is a secured protocol which is used for encrypting information such as passwords on websites.

4.3.2. Why is it that the website at the orphanage still needs both the numbered IP address as well as their chosen URL? (2)

The computer uses the IP address while users find it easier to type in a URL.

4.4. The IT technician warns all youngsters at the orphanage that any information uploaded or posted to social networking sites can be dangerous to their personal safety. He also warns them that they should be aware of identity theft, cyber-bullying and general malware.

4.4.1. Explain the term malware. (2)

Malware is malicious software. Programs designed to do computer systems and data some harm.

4.4.2. Name two types of malware which someone could use to access your personal information without your knowledge. (2)

Keylogger : Spyware

4.5. Name two items of personal information that should not be posted on social networking sites. (2)

e-mail addresses ; phone numbers; home/work addresses; any other personal info.

4.6. What do you understand by the term identity theft? (2)

When somebody obtains your personal information in order to pretend to be you.

1.6.5. State two measures that may be taken to prevent identity theft. (2)

Don't give out personal information

Install anti-spyware software

Keep documents that contain your personal information in a place of safety

Try to use only reputable websites with personal details.

4.7. The most common forms of internet fraud is "**spoofing**" and "**phishing**". Differentiate between phishing and spoofing. (4)

Phishing – criminals send out millions of e-mails asking strangers for personal information. They provide legitimate reasons for their request e.g. on behalf of banks etc.

- They appear to be reliable source.

Spoofing – criminals make a copy of websites homepage and publish on the internet with an address

- similar to original.

As soon as you log in with some personal details, criminals access this and commit fraud.

4.8. It is necessary for the organisation to be up to date with techniques of securing the computers that are being used on the internet by children at the orphanage. Discuss the two protection techniques below:

4.8.1. Audit trail (2)

An audit trail is a record of who did what and when did they do it. It does this by keeping track of login times and user ID's. Keeps track of changes made to data e.g. updates, deletes etc.

4.8.2. Honeytraps (2)

A honeypot is used to protect a company's network. It refers to a vulnerable computer that is set up to entice an intruder to break into it. Is basically a trap set up for intruders.

4.9. The orphanage received 20 smart phones(i-phone) for the top achievers at the orphanage.

4.9.1. State three(3) distinctive features of a mobile phone for it to be classified as a smart phone. (3)

Display maps; Has more memory than normal cell, Allows internet access, Has PDA capabilities. Receives and sends e-mail; GPS enabled ; Touch Screen. Advanced OS; IMs etc

4.10. The staff at the orphanage is environmentally conscious and they inculcate this attitude throughout the organisation. The IT technician enforces this ideology by constantly speaking to the youngsters at the orphanage about "Green Computing"

4.10.1. Define the term Green Computing. (2)

Green computing refers to initiatives to design and dispose of technology in an environmentally friendly or eco-friendly way.

4.10.2. State three ways of effectively practicing Green Computing. (3)

Switch off all computers when not in use.

Avoid senseless wasting of paper by printing back to back, minimising fonts

Avoid dumping old equipment, donate it, recycle it, upgrade or repair it

Old cartridges and toners could be sent back to manufacturers as they know how to either use or dispose in an environmentally friendly way or refill and use ink.

[40]

QUESTION FIVE [30]

- 5.1.1 A loop is a programming structure that allows statements to be repeated✓✓
 5.1.2 for ...loop✓
 5.1.3 When the amount of data is known✓✓

- 5.2.1 Adjust size of buttons/labels/textfields
 -re-align the components
 - Keep to standard conventions and follow HCI principles {any 2}✓✓

- 5.2.2 Data needs to be validated as it will be typed by user✓

- 5.2.3 combo-box, radio buttons or jlist {any 2}✓✓

- 5.3.1 Used to initialize the attributes✓

- 5.3.2 Tour() : Default constructor – used to give attributes default values
 Tour(tourRef,name, destination) – Parametrised constructor- used to initialize attributes
 with their instantiated values ✓✓✓

- 5.3.3 setDestination () – should be receiving a parameter value✓✓

- 5.3.4 a) toString()✓
 b) setDestination ()✓
 c) Tour()✓
 d) getDestination()✓

- 5.4.1 a) Count – is used to test for the factors of the number as it will also represent the loop counter✓✓

- b) CountFact- Used to store the number of factors✓✓

- 5.4.2 countFact ← 0✓

- 5.4.3 a) num MOD Count =0✓✓
 b) inc(CountFact) ✓
 c) num ' is prime ✓
 d) num, ' is NOT prime✓✓

QUESTION SIX [40]

- 6.1.1 Phishing✓

- 6.1.2 Spoofing✓

- 6.2.1 Biometrics✓

- 6.2.2 -voice recognition

-facial recognition

-retina scanner

{any other 2 biometrics eggs}✓✓

- 6.3.1 **Data:**

Raw facts and numbers usually type into the database tables/excel spreadsheets.

Example:

The raw numbers of tourists arriving in the country

Information:

Results of queries/data filtered or sorted to answer questions.

Example:

A report on the number of tourists grouped per country of origin ✓✓

6.3.2 Record-locking is required:

- if more than one employee works on the same record some of the changes done will be lost. ✓✓
- because if the record is locked only one person is allowed to work on that specific record. ✓✓

6.3.3 Any TWO duties of a database administrator (excluding planning and creating database)

- Control access to the database – setting up user accounts/password
- Creating backups of the database/get recovery procedure in place/do recovery of data
- Create the queries required by the people using the database
- Creates and maintains a data dictionary ✓✓
- Monitor performance of the database

6.4.1 (Any ONE – WiFi)

Wireless network connectivity

A standard that allows devices to communicate wirelessly with one another Wireless Fidelity ✓

6.4.2 (Any TWO)

- Laptop
- Tablet PC
- Smartphone

-PDA

-eBook reader ✓✓

6.4.3 (Any suitable explanation)

Some WiFi networks are used for WLAN connectivity without Internet access.

The business may require users to pay for Internet access. ✓✓

6.4.4 (Any ONE)

-Packet-sniffing

-Eavesdropping ✓

6.4.5 (a) NO ✓

Firewall's protect a computer from unwanted access but they do not secure outgoing data. ✓

(b) YES ✓

(Any ONE)

You can only decrypt the transmitted data if the encryption key is known.

Without decrypting the data would not be useful. ✓

(c) NO ✓

Virus scan only scans local computers and doesn't affect outgoing data ✓

6.4.6 (Any ONE)

-3G

- iBurst/Sentech

- WiMax ✓

6.5.1 A travel blog is an electronic journal/diary through which tourists can share knowledge and experiences about holiday destinations ✓✓

- 6.5.2 Accept any TWO ways of planning a holiday using ICT ✓
- Using the Internet for booking of flights, transport, hotel, etc
 - Doing research on the destination
 - Easy to compare prices for different tour packages

(or any explanation that correlates with this description) ✓✓

- 6.6 Accept any THREE ways of verifying the trustworthiness of data/information
- Check if data is authentic
 - Is the data from where it says it comes/Author?
- Check data for validity/Is source valid?
- Is data up-to-date?
 - Does the data correlate with other sources? ✓✓✓

6.7.1 3G: Third generation. ✓

6.7.2 Any TWO problems with 3G:

- Not always available due to weather conditions, etc.
- Eavesdropping can take place to get hold of results
- There may be no coverage in the area

{Any other acceptable disadvantage } ✓✓

6.7.3 Asymmetric service: when the upload and download speeds are different. ✓

6.8.1 Any ONE social media website:

- Facebook
- Twitter
- YouTube
- What's Up

{Also accept any other appropriate alternative }✓

6.8.2 Yes or No

NOTE:

- The mark for yes/no is only given with a valid motivation
- Any ONE correct motivation

If answered Yes:

- Only if the marshal can confirm the validity of the information
- It is available in the public domain.

If answered No:

- It was placed on the social network available for people to see - someone's own opinion
- Information may be incorrect due to cyber bullying

✓✓

6.8.3 Identity theft✓

TOTAL = 150



[Faint, illegible text at the bottom of the page, possibly bleed-through from the reverse side.]