KZN DEPARTMENT OF EDUCATION

GREENBURY SECONDARY SCHOOL

INFORMATION TECHNOLOGY

GRADE 11

MARCH CONTROL TEST 2017

MARKS: 60 **TIME: 1 ½ hour**

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MODERATOR: S NAIDOO **DATE: 23 – 03 – 2017**

This question paper consists of 5 questions on 6 pages.

INSTRUCTIONS AND INFORMATION

1. Read ALL questions carefully.
2. Answer ALL questions.
3. Answers should be as concise as possible.
4. Number your answers exactly as the questions.
5. Good Luck!

P.t.o. QUESTION ONE Page 2...

QUESTION ONE

For each question 1.1.to 1.10. there are four options given. Choose the letter of the answer that best matches the question above it.

1.1. The Front Side bus...

A) Is a serial cable which is used to connect the CPU to external ports.

B) Connects printers to stand alone PC's.

C) Stores the results of calculations performed in the CPU.

D) Comes in several types, such as data instruction, or address.

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 video.

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

D) software that prevents unauthorised accessto a network.

1.3. A UPS ...

A) is used to provide limited alternative power in the event of a power failure.

B) stands universal power supply.

C) is a type of connector that is used for keyboards.

D) is used to connect networks.

1.4. Open source software is...

A) the same as free software.

B) software that can be downloaded for the internet, but which, does not have documentation or support.

C) available under a licence that permits users to change and improve the software, and then to redistribute in a modified form.

D) Usually unreliable as people have tampered with it.

1.5. Which one of the following combination of components is found on the motherboard?

A) Printer, keyboard, busses

B) CPU, busses, mouse driver

C) HDD, system clock, RAM, ROM

D) CPU, RAM, ROM, CACHE memory, busses, system clock

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QUESTION TWO

For each of the questions(2.1 to 2.10),write down only the letter of the term/phrase from column B that matches the description in Column A.

COLUMN A	COLUMN B
2.1. It converts each program line into machine code and executes it.	A Delphi
2.2. An Example of a high level language program is_____.	B HTTP
2.3. ____ is the communication protocol for the internet.	C WiFi
2.4.A secure version of Hypertext Transfer Protocol.	D POST
2.5. Low level language programs are called machine language or _____ language.	E Serial
2.6. A wireless communication standard that uses an extremely high bandwidth over relatively longer distances.	F Parallel
2.7. A network topology in which one terminal failure results in the shutdown of the network.	G Interpreter
2.8. Data is transmitted one bit at a time, one after the other on a single wire.	H Bus
2.9. A set of diagnostic routines carried out whenever a computer is booted.	I Firmware
2.10. _____is software that is written to the read-only memory (ROM) of a computing device.	J Secure sockets layer
	K Ring
	L Formatting
	M TCP/IP
	N BIOS
	O Assembly
	P WiMAX
	Q SAMOS
	R CMOS

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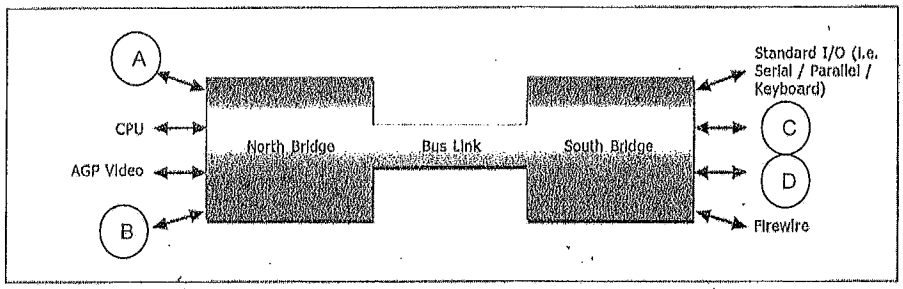
QUESTION THREE [Hardware - Computer Architecture]

Your school wants to upgrade their computers. They have decided to purchase some new ones as well as refurbish some of the old ones. One of the teachers approached you to assist them in making the right decision when it comes to purchasing computers and upgrading the old ones. Assist them in defining technical terms related to modern PC designs.

3.1. Give a brief account of the purpose of a "chipset" in a computer. (2)

3.2. Examine the diagram below and indicate possible components labels for A, B, C and D respectively. (4)



3.3. Highlight the difference between the **I/O- bus** and the **expansion bus** by stating the main function of each. (2)

3.4. State two problems that may arise as a result of overclocking a CPU. (2)

3.5. The new computers contain two **USB** ports and a **fire-wire** port and a **HDMI** port.

3.5.1. Suggest ONE use of a fire-wire port. (2)
3.5.2. What does HDMI stand for? State one advantage of this type of port. (2)

3.6. Explain how **Blu-ray** disks store, read and write information as opposed to normal DVD's. (2)

3.7. How are SSD's different from magnetic hard drives. State 3 advantages that SSD's have over SATA and IDE drives. (4)

3.8. What are the components of Access time on a disk? (2)

3.9. Cache memory is an integral part of the modern computer system. The earliest form of cache in the CPU has led to other forms viz. Disk caching, browser caching and web caching.

a) Describe the levels of Cache in the computer in and around the CPU by giving their location. (3)
b) Discuss the two other types of caching underlined in the statement above. (2)

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QUESTION FOUR [System Software]

The computers need to have a good Operating system. The choices given are between Windows 8 and Windows 10.

4.1. Discuss the 3 main functions of a computers operating system. (3)

4.2. Discuss how the OS uses **interrupts** under the following headings:

a) Hardware interrupts (1)
b) Software interrupts (1)

4.3. One of the key areas of managing memory by the operating system is virtual memory.

4.3.1. Briefly describe what virtual memory is. (2)
4.3.2. What is the advantage of using virtual memory. (2)

4.4. Many different processing techniques have been developed over the years to help the operating system and the CPU perform faster and more efficiently. Briefly describe the following processing techniques:

4.4.1. multiprocessing (2)
4.4.2. multitasking (2)
4.4.3. hyperthreading (2)

4.5. Apart from any version of Windows, write down the name of TWO other operating systems you have heard of that is designed for computers. (2)

4.6. Explain the main difference between a printer controller and a printer driver. (2)

4.7. Explain the meaning of the term "Hot Swapping/Hot Plugging" and give an example. (2)

4.8. What do the following acronyms stand for?

a) IRQ (1)
b) OSS (1)

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QUESTION FIVE [NETWORK AND COMMUNICATIONS TECHNOLOGIES]

The current network in the IT room needs to be upgraded if new computers are to be purchased.

5.1. **Coaxial** and STP cables used in the IT rooms pose three major problems due to the copper that is used in the cabling. Name and briefly describe each problem. (6)

5.2. The different rooms in the school have different LAN topologies. Each LAN segment is joined. Discuss the functions of the devices below:

5.2.1. Repeater (2)
5.2.2. Bridge (2)
5.2.3. Router (2)

5.3. Complete the table(5.3.1. – 5.3.6.) showing the different LAN technologies used at your school. (6)

	Ethernet	FDDI
Common topology used	5.3.1.	5.3.4.
Types of cabling used	5.3.2.	5.3.5.
Media access method	5.3.3.	5.3.6.

5.4. What is the main purpose of a Gateway? Explain how it differs from a router. (2)

5.9. What does it mean to say that the school is a HOT SPOT? (2)

5.10. Learners in the school will be allowed to use their tablets or smartphones to access the Internet, with obvious restrictions. Discuss the different technologies that may be used by the different devices under the following headings:

a) EDGE (1)

b) 4G LTE (1)

c) WiMax (1)

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TOTAL = 90 ÷ 3 x 2 = 60

GREENBURY SECONDARYSCHOOL

INFORMATION TECHNOLOGY

GRADE 11

MARCH CONTROL TEST 2017 - MEMO

QUESTION ONE

1.1. D √
1.2. B √
1.3. A √
1.4. C √
1.5. D √

QUESTION TWO

2.1. G
2.2. A
2.3. M
2.4. J
2.5. O
2.6. P
2.7. K
2.8. E
2.9. D
2.10. I

QUESTION THREE

3.1. *Is a set of chips(integrated circuits) used on the motherboard to connect components. It controls and handles connection of respective circuits and ports to the motherboard.* √ √ (2)

3.2. *Northbridge – A - RAM* √ *B - PCI-express* √
Southbridge C- PCI √ *D- USB* √ (4)

3.3. *The FSB is a pathway to transfer data between the CPU and RAM. It also connects the CPU and the rest of the hardware via the Northbridge.*√

The expansion bus allows you to connect other components to your computer. √ (2)

3.4. *It Will perform beyond the stock performance thus putting a strain on the CPU. Overheating may occur. The device may malfunction.* (2)

3.5.1. *Connect digital video cameras or multimedia devices.* √√ (2)

3.5.2. *High Definition Multimedia Interface. No risk of quality loss. Is an all-digital interface that does not require conversion at either end.* √√ (2)

3.6. *They store large volumes of High Definition video and audio. Uses blue laser instead of red. Shorter wavelength. Can hold 5 times more data than a dvd.* √√ (2)

3.7. *They have no moving parts. They do not rely on magnetic fields. They use electric current. Much Faster. No noise. No physical damage due to impacts.* √

Less susceptible to physical shock. They have a lower access time or latency. They do not need to be defragned since that hav no moving parts. √√√ (4)

3.8. *Access time = Seek time(√) +Latency Time(√)* (2)

a) L1 – Small amount built in the internal circuitry of the CPU chip. √
L2 – Larger than L1 – on the CPU chip slightly further from internal circuitry but also slower that L1 √
L3 – On the actual board itself but very closer to CPU than RAM. Larger and \ slower than both L1 and L2 √ (3)

b) *Disk Caching - Fast access area of the hard disk or RAM set aside for recently used files in the hope that they will be used again.* √

Web caching is a shared store of previously downloaded web pages. √ (2)

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QUESTION FOUR

Controlling all hardware and software resources. Includes process management, memory management, secondary storage management and file management. √
Loading and running application programs *(3)*

4.2. a) *Sent from a device such as the keyboard indicating a key has been pressed or from a printer to say it is out of paper.* √ *(1)*

b) *Generated from programs. Example if a division by zero occurs during processing.* √ *(1)*

4.3.1. *Is the use of secondary storage as part of RAM. It gives the impression that more RAM exists than there actually is.* √√ *(2)*

4.3.2. It prevents the computer from freezing when the device is too slow. Allows the tasks to be processed even if RAM is limited. √√ *(2)*

4.4.1. When there are many processors available to work on many tasks concurrently. √ *(2)*

4.4.2. When a single processor is able to process many tasks. √√ *(2)*

4.4.3. Hyperthreading enables different threads of a program to share the use of one CPU by simulating two execution units of the CPU. √√ *(2)*

4.5. Any two names provided they are legit OS's. iOs , Linux, Mac OS√√ *(2)*

4.6. A printer driver is the program on the computer attached to the printer that communicates with the printer. √
A printer controller is made up of the printer's own electronic components and circuitry. √ *(2)*

4.7. While the computer is on, you may add components and remove components. e.g. Flash drives. √√ *(2)*

a) IRQ Interrupt request √ (1)

b) OSS Open Source Software √ (1)

QUESTION FIVE

5.1. Attenuation – Weakening of the signal as the length of cable increases. √
EMI – Signals from other sources such as machinery can corrupt the signals travelling in copper cables nearby. √
Eavesdropping – Signals travelling copper wires can be intercepted by outsiders √
Crosstalk – Signals in adjacent wires can interfere with each other as in a crossed telephone conversation.

5.2.1.
A repeater is used to connect **network segments** (a section of a network) over longer distances because the signal strength weakens (attenuation) and must be boosted. For example, signals on UTP cable weaken after 100m and need to be boosted if the destination is further than that distance. A repeater simply strengthens all signals and sends them on without looking at their destination addresses. The repeater does not have any intelligence so it cannot look into packets and obtain information such as IP addresses or MAC addresses.

5.2.2.
A bridge connects network segments, strengthens the signals as they pass through it and also looks at the MAC addresses of the signals, only forwarding data packets to a different network segment if the MAC address is not in the segment from which the packet comes. A bridging table is used to keep track of the devices on each segment. Wireless bridges are sometimes used to connect network segments in different buildings which can be cheaper than using fibre optic cable.

5.2.3.
A router is a sophisticated device that is usually used to connect different networks that can use the same protocols (in most cases TCP/IP). A router also boosts signals and in addition uses nodes' IP addresses to determine the best path for data packets to travel along to reach their destinations. A **routing table** is stored with information about all networks that the router is connected to. This table is used by the router to determine the best (quickest, least busy, most cost-effective) route to be used. When a Web site is accessed for example, the request will often go via many different routers before it reaches the desired Web site. If there are problems on any of the routes the routers will avoid these.

5.3.1. Star or (Bus in older networks) √ (1)
5.3.2. Twisted Pair(UTP Commonly used) , Fibre optic√ (1)
5.3.3. CSMA/CD √ (1)
5.3.4. Ring √ (1)
5.3.5. Fibre Optic √ (1)
5.3.6. Token Passing √ (1)

5.4.
A gateway is a network point that acts as an entrance to another network. It is more intelligent than a router and is able to inspect the network packets to the extent that it can join two networks that use different protocols. A network gateway can be set up using only software, or by using a gateway hardware device, or as a combination of both. The types of protocols the gateway supports will determine how it should be set

5.9. The school has a wireless network setup with wifi and other devices may be able to log onto the network and gain access to the internet. √√ (2)

5.10.

a)

EDGE, which is also known as Enhanced GPRS or EGPRS, is a data system used on GSM networks. It is three times as fast as the outdated GPRS system. The maximum speed is approximately 135Kbps. The phone and the cellular network must both support EDGE in order for it to be activated; if not, the phone will automatically use GPRS. EDGE meets the requirements for a 3G network but is usually classified as 2.75G.

b)

4G is the fourth generation of mobile phone communications standard and follows 3G. A 4G system provides mobile users with ultra-broadband Internet access. This extended bandwidth makes IP telephony, gaming services, high-definition mobile TV, video conferencing and 3D television possible from mobile devices.

4G systems include the Mobile WiMAX standard and the first-release Long Term Evolution (LTE) standard.

c)

WiMAX (Worldwide Interoperability for Microwave Access) is a wireless communications standard which can commonly provide from 30 to 40 Mbps up to Gbps data rates.

This extremely high bandwidth available to mobile devices will make the following applications of WiMax possible:

- Providing portable mobile broadband connectivity on a variety of devices.
- Providing a wireless alternative to cable and digital subscriber line (DSL) for broadband access.
- Providing data, telecommunications (VoIP) and IPTV services.