GREENBURY SECONDARY SCHOOL
MARCH CONTROL TEST 2018
GRADE 12
INFORMATION TECHNOLOGY

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MODERATOR: S NAIDOO

DURATION: 1 ½ HRS
MAX MARK: 60

<u>DATE: 15-03-2018</u>

Instructions to candidates:

1. Ensure that this paper consists of **5** questions on **6** pages.
2. Answer all questions.
3. Rule off after each question.
4. Write neatly and legibly.
5. Write clear and concise answers. Use the mark allocation as a guideline when answering.
6. Good Luck!!

QUESTION ONE (MCQ) [10MINS]

Write down the letter of the alternative that best matches the statement in 1.1. to 1.10.

1.1.   The general term for the provision of hosted services over the internet.

      A   Virtualisation
      B   PAAS
      C   Cloud Computing
      D   IAAS

1.2.   A _____ or cracker breaks into computer systems with criminal intent.

      A   Script Kidddie
      B   Black Hat
      C   Trojan
      D   White Hat

1.3.   A computer that is set up to forward malicious software to other computers without the owner's knowledge is called a _____.

      A   Zombie
      B   Virtual Server
      C   Cookie
      D   JVM

1.4.   A server program that allows users to collaborate in forming the content.

      A   Portal
      B   RSS
      C   ISP
      D   Wiki

1.5.   When a network is accessed and then controlled in such a way that the network may be shut down, or access blocked to services and even disabled and held to ransom.

    A   Backdoor
    B   Siphoning
    C   DOS attack
    D   Man in the middle attack

1.6.   A *virtual machine* is ...

    A   a new prototype for a computer.
    B   a theoretical computer such as the Turing machine.
    C   software emulating a computer.
    D   a computer running multiple operating systems.

1.7.   The process of storing two sets of instructions on two separate registers in the same CPU allowing the CPU to switch between two processes, is called....

    A   Multiprocessing
    B   Multitasking
    C   Hyperthreading
    D   Multiprogramming

1.8. The access time on SATA drives is measure by the following formula:

    A   Seek time + Latency time
    B   Latency time + Read Time
    C   Rotational delay time + Seek Time
    D   Seek time + Read Time

1.9.   _____is shared content accessed by groups over several LANs through "cross-enterprise" boundaries by allowing customers access to some content on your network.

    A   Internet
    B   Extranet
    C   WWW
    D   Intranet

1.10.   Which of the following refers to a type of file system?

    A   NTFS
    B   SMTP
    C   TCP/IP
    D   TLS

                                                                                    [10]

QUESTION TWO [15 MINS]

Write down the letter of the term in column B that best matches the statement in column A.

COLUMN A	COLUMN B
2.1. A set of related programs that protects the resources of a private network from users on other networks.	A Cracker
2.2. A software application that will prevent, detect and remove Malware infections from computers, servers and networks.	B Backdoor
2.3. The total amount of data that can be transferred from one point to another in a given period of time.	C Script Kiddies
2.4. A Person who breaks into a computer system with malicious intent.	D IAAS
2.5. Unskilled individuals who use scripts or programs developed by others to attack computer systems and networks and deface networks.	E Bandwidth
2.6. ___is where computer resources, such as hardware, software and networks are owned and hosted by a service provider and offered to customers on demand.	F FTP
2.7. Duplicating and selling copyrighted programs.	G Mbps
2.8. Prevents normal use of your computer or network by normal users. The attacker can shut the network down.	H Push-based
2.9. When a service provider uses public cloud resources to create their private cloud.	I Denial-of-Service Attack.
2.1.0. A _____ in a computer system is a method of bypassing a normal login route; it is illegal remote access to a secure computer or network.	J External Bus
	K Anti-Spam
	L Antivirus
	M Counterfeiting
	N Virtual private Cloud
	O Thin Clinet
	P Firewall
(10x2 = 20)	Q VPN

[20]

QUESTION THREE (HARDWARE) [25 MINS]

> SCENARIO
>
> **HIGH FLYERS** is a program aimed at testing and identifying learners with academic ability. They wish to standardise resulting and recording by the introduction of computers and internet. They are moving from independent testing, resulting and recording at several branches to a centralised system done immediately using technology available.
> Each branch that is set up needs to purchase an up to date computer and equipment.
> You are part of the technical team appointed to examine and choose a computer that will best serve the needs of the organisation.

3.1. Modern computers are built using modular design. With this type of PC development, the owner is given the upper hand when it comes to buying the best to suite his needs.

3.1.1. Explain the meaning of the word modular design. (2)

3.1.2. Explain to the members of the technical team the reason why you suggested maximum RAM size, with respect to its effect on processing and the CPU. (2)

3.2. The following diagram, representing some of the components on a motherboard, was given to you to explain more about how a computer operates:
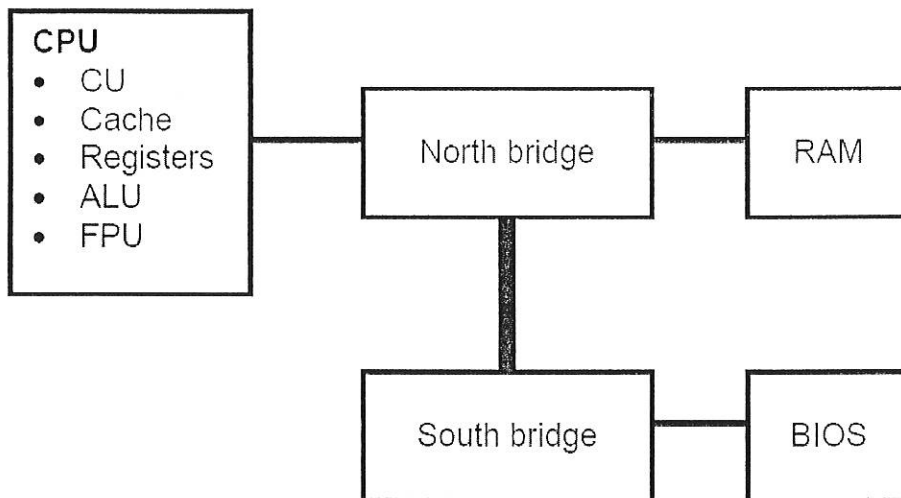
The following questions came up from team members who were not very familiar with computer jargon.

3.2.1. Briefly explain the function of registers and then how this improves the performance of the computer. (2)

3.2.2. Explain why instructions loaded in cache memory are processed faster by the CPU than instructions stored in RAM. (2)

3.2.3. If the statement above is true, why is cache so limited compared to RAM? (2)

3.2.4. What is the physical connection between the CPU and the north bridge called? (2)

3.3. *A large hard drive is required because of the volume of data to be stored.*

3.3.1. State two differences between a SATA drive and a SSD. (4)

3.3.2. Explain how the **access time** on a HDD reduces the performance of a computer with reference to **seek** and **latency** time. (2)

3.4. *A LAN technician advised that a computer may be improved by overclocking a CPU, increasing the register size or employing multiprocessing techniques.*

3.4.1. What does it mean to overclock a CPU? (2)

3.4.2. List **TWO** problems with Overclocking. (2)

3.4.3. Explain the meaning of the term **Multiprocessing** and discuss how it differs from **multitasking**. (2)

[24]

QUESTION FOUR (Software and Computer Management) [25 MINS]

With the inception of specialised services on the internet like Cloud Computing and Virtualisation. It is important that users become ofay with the advantages that it provides their particular applications. It is therefore important to answer questions based on internet and networking advancements.

4.1. List two factors related to networking that may affect the performance of a computer. (2)

4.2. The team is keen on learning about internet services available. They heard about *"Cloud Computing"* and *"Virtualisation"*.

4.2.1. Give a full explanation of the term Cloud Computing. (2)

4.2.2. Briefly discuss the three broad categories of Cloud computing. (3)

4.2.3. Tabulate 2 advantages and 2 disadvantages of cloud computing (4)

4.2.4. Explain the process of Virtualisation. (2)

4.2.5. What is a virtual machine? (1)

4.2.6. State two advantages and two disadvantages of server virtualisation. (4)

4.2.7. Discuss the following virtualisation techniques:

a) Network Virtualisation (2)
b) Desktop Virtualisation (2)
c) Application Virtualisation (2)

[24]

QUESTION FIVE [15 Min]

A social networking service is a platform to build social networks or social relations among people who, for example, share interests, activities, backgrounds, or real-life connections.

5.1. Discuss the term social engineering with relevance to the above statement. (2)

5.2. List **TWO** ways in which one may reduce the impact of the use of computers on the environment. (2)

5.3. Discuss software theft under the following headings:

     5.3.1. Hard-disk-loading (2)

     5.3.2. Softlifting (2)

5.4. List any **TWO** forms of internet attacks. (2)
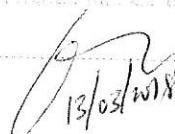
5.5.

A cyber countermeasure is defined in Wikipedia as an "action, process, technology, device, or system that serves to prevent or mitigate the effects of a cyber-attack against a computer, server, network or associated device. A number of countermeasures exist that can be effectively implemented in order to combat cyber-crime and increase security."

Cyber-crime is a global problem which many governments and large organisations are involved in placing policies in place in an attempt to curtail computer crimes

5.5.1 List TWO countermeasures, mentioned above, that you have heard of. (2)

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TOTAL : 90 ÷3 x 2 = 60
THE END!

EXAMINER: M PADAYACHEE

Marking Memo

DURATION: 1 ½ HRS

Question One

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

Question Two

2.1.	P
2.2.	L
2.3.	E
2.4.	A
2.5.	C
2.6.	D
2.7.	M
2.8.	I
2.9.	N
2.10.	B

Question Three

3.1.1 Modular design – the computer you buy can be put together in pieces with your own specifications in mind. The hardware is not fixed. They are separate modules which are put together and connected via the motherboard.

3.1.2. The ram is important because it is needed by the CPU to process instructions. If you choose less, then processing gets slower. Ram stores the operating system.
The more the RAM the faster the computer performs. It is electric memory.
Some computers do not allow you to add more RAM later. The RAM may not be recognised by the motherboard.

3.2.1.
A *register* acts as temporary storage✓ to keep data and instructions to be executed by (2)
the CPU✓.
It is found inside the CPU and can be accessed immediately hence there is no search for
data making it faster.

3.2.2.
- Cache is higher quality/faster type of memory/cache is static RAM compared to dynamic
  RAM
- Cache is positioned on the CPU/Cache closer to CPU and thus fetches instructions faster
- Data in RAM needs to be transferred via busses to the CPU before it can be
  processed/Fetching of instructions from cache is not restricted by slow speed of the
  motherboard   (2)

3.2.3.
Cache is made up of SRAM, it is expensive and large. Cannot fit large amounts in
CPU.   (2)

3.2.4.
Front side bus , System bus, Internal bus   (2)

3.3.1.

SATA	SSD
- Limited by moving parts - Slow - Has to be defragmented	- Not limited by moving parts- fixed parts - Faster - Doesn't have to be defragmented

3.3.2.
Seek time is the time it takes the read/write head to move over the correct track.
Latency time the time it takes to wait for the disk to spin under the track.   (2)

3.3.3. a) *Thrashing:*
• Occurs when the operating system spends so much time exchanging pages✓   between the
RAM and hard drive (virtual memory)✓   that it seems there is no time to process any other task
OR

• When the amount of virtual memory is too small for the amount of data that needs to be stored, it
seems that the hard drive light keeps flashing, while the exchange of pages occur between the
RAM and smaller amount of virtual memory

3.4.1.
Overclocking is when a computer components are made to operate beyond their stock
performance levels by manipulating the frequencies by which these components are set to
run. The CPU operates faster than the System clock by changing its own multiplication
factor.

3.4.2.
–The components run faster than what they were intended leading to instability and failure.
- It increases power consumption thus generating more heat which must be dispersed if the
  component is to remain operational.

3.4.3.
– Multiprocessing is when there are many processors available to complete a task.
- Multitasking is when a single processor works on several tasks. They differ with respect to
  the number of processors.

QUESTION 4

4.1. External network speed , Internal network speed, NIC speed, Cabling, Wired or Wireless (2)

4.2.1. Cloud computing is a general term for the providing of hosted services over the internet. These services are broadly divided into three categories: IaaS , PaaS , SaaS. (2)

4.2.2. PaaS - Platform as a Service is part of cloud concept that provides a computing platform for The development of software by users. (1)

IAAS - Infrastructure as a Infrastructure as a service is where computer resources, such as hardware,software and networks are owned and hosted by a service provider and offered to customers ondemand. (1)

SaaS - Software as a service is a software delivery model in cloud computing in which software andassociated data are centrally hosted on the cloud by independent software vendors (ISVs)or application service providers (ASPs). E.g. Google Apps. (1)

4.2.3.

Advantages	Disadvantages
- Cost Effeciency - Convenience and continuous availability - Backup and recovery - Cloud is environmentally friendly - Reliance and redundancy - Scalability and performance - Quick deployment and ease of integration - Increased storage capacity - Device diversity and Location Independence - Smaller learning curve	- Security and privacy in cloud - Dependency and vendor lock-in - Technical difficulties and downtime - Limited control and flexibility - Increased vulnerability

4.2.4. Virtualisation is the process of creating logical computing resources from available physical resources. (2)

4.2.5. A virtual machine is a software implementation or emulation of a computer that executes programs like a physical machine. (1)

4.2.6. Advantages:

- Multiple OS environments can co-exist on the same computer in strong isolation from each other.
- The virtual machine can provide an Instruction Set Architecture(ISA) that is somewhat different from that of the real machine.
- Application provision, low maintenance, high availability and disaster recovery.

Disadvantages:

- A virtual machine is less efficient than a real machine when it access the hardware indirectly

- When multiple VM's are concurrently running on the same physical host, each VM exhibit a varying and unstable performance (speed of execution, poor results), which highly depends on the workload imposed on the physical system by other VM's. (4)

Question Five

5.1. Is the psychological manipulation of people into performing actions or giving personal details or confidential information and is used for criminal pupooses.

5.2.
- Disposing of electronic waste. Find an e-waste centre near you. Perhaps get your school involved in setting up an e-waste recycling unit to service your community.
- Recycle paper and donate old devices in working order to less fortunate individuals or schools.

5.3.1.

Hard-disk loading: Installing and selling unauthorised copies of software on refurbished or new computers.

5.3.2.

- **Softlifting**: Borrowing and installing a copy of a software application from a colleague.

5.4. Semantic , Denial-of Service , Man-in-the-middle , Backdoor , Siphoning

5.5.

- Install a good firewall.
- Install good anti-malware software and keep this software updated.
- Backup your data.
- Encrypt sensitive data such as passwords.
- Secure your passwords - learn more about how to create strong passwords and keep your information safe.
- Prevent identity theft - know the common tricks that criminals employ to help you protect yourself from online fraud and identity theft.
- Avoid scams - the web can be a great place, but not everyone online has good intentions. Learn three simple ways to avoid scammers and stay safe on the web.
- Log off from website once you have completed your business. Most good websites will log you off after a set amount of time.
- Check your social media settings – make sure you have ensured maximum privacy.
- Use secure networks - be extra careful whenever you go online using a network you don't know, and learn about setting up your home router and Wi-Fi network securely.

(2)