

**INFORMATION TECHNOLOGY
PAPER 2: THEORY
GRADE 12
JUNE EXAMINATION 2014
MEMORANDUM**

TOTAL: 150

SECTION A

QUESTION 1

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

[10]

SECTION B: HARDWARE AND SOFTWARE

QUESTION 2

- 2.1 56K modem ✓
802.11b/g ✓
(NOT 10/100 Ethernet LAN.) (2)
- 2.2.1 CPU needs cache memory to avoid waiting for slower components. ✓ (1)
- 2.2
2.2.2 Blocks of data and instructions that the CPU probably needs next will be fetched from RAM and placed in cache memory. ✓
When the CPU requires data/instructions, cache is searched first because cache memory matches speed of CPU.
If data/instructions needed are not found, new data and instructions are fetched from RAM. ✓ (2)

- 2.3
- 2.3.1 FSB connects the processor ✓with high speed components. ✓ (2)
- 2.3.2 FSB connects the processor with high speed components such as RAM whereas the external bus connects (the South Bridge) to slower peripheral connection slots/devices. ✓✓ (2)
- 2.4
- 2.4.1 Any TWO: ✓✓
- Controls all resources (hardware and software).
 - Responsible for the loading of programs and running programs.
 - Provides user interface.
 - Responsible for basic security.
 - File handling. (2)
- 2.4.2 Linux. ✓ (1)
- 2.5 There are two processors on the chip. ✓✓ (2)
- 2.6
- 2.6.1 Plug-and-play is a technique whereby new hardware that is added to a computer is automatically detected ✓and configured by allocating the necessary resources. ✓ (2)
- 2.6.2 Both refer to a new device being automatically detected and configured. ✓ Hot-swappable means that the device can be added/removed without powering the computer down. ✓ (2)
- 2.6.3 Software that allows the operating system ✓ to communicate with/control a device. ✓ (2)
- 2.6.4 No, every device needs a driver. ✓
With plug-and-play the drivers can be automatically installed without the help of the user.✓ (2)
- 2.6.5 The operating system has many built-in drivers ✓ but it is possible that the operating system does not have drivers for this specific device. ✓ (2)
- 2.7
- 2.7.1 Virtual memory is a portion of hard drive space that acts as memory (RAM). ✓✓
Data is swopped between the memory and the hard drive (swop file) as needed. ✓✓ (2)

2.7.2 The amount of available hard drive space becomes too small. ✓
The performance of the system is reduced. (Also accept 'thrashing'
or 'slow'.) ✓ (2)

2.7.3 Any TWO solutions ✓✓ and reasons: ✓✓
▪ Increase the amount of memory so that the use of virtual memory is reduced.
▪ Make more hard drive space available/increase the maximum size of the swap file so that there is enough space to store data swapped from RAM to the disk.
▪ Use quicker hard drives (SATA, solid state) so that data can be exchanged quicker. (4)

2.8

Any TWO reasons: ✓✓
▪ Not enough memory installed.
▪ Not enough space available on the hard drive.
▪ Not compatible with the operating system.
▪ You're trying to run a 16-bit program in a 64-bit environment. (2)

2.9 The hibernation message appears to warn the user that the laptop is going to a reduced power mode to save power/store the contents of memory on disk. ✓
A laptop uses battery power and a desktop uses a constant supply of electricity from an electrical supply. ✓ (2)

2.10

2.10.1 If a hard drive is divided into partitions, it will appear as if there is more than one hard drive available. ✓✓ (2)

2.10.2 Any TWO advantages: ✓✓
▪ Different operating systems can be installed.
▪ Better for backup operations if the data is on one partition and the programs on another partition.
▪ Better security can be maintained.
▪ Protecting or isolating files, to make it easier to recover a corrupted file system or operating system installation. (2)

2.11 DDR2 refers to a specific type of memory (memory module) ✓✓ and the 667 refers to the specification of the speed of the memory. ✓ (2)

2.12 Any TWO reasons: ✓✓
▪ Uses less power.
▪ Smaller (uses less space).
▪ Less flicker of image.
▪ Better viewing angle. (2)

2.13 Multi-threading is where one program has independent sections (threads) running simultaneously OR different instructions are executed at the same time in one program. ✓

Any ONE example: ✓

- Word processor with spell-checker running in the background.
- A large calculation process where independent sections can be completed simultaneously.
- A computer game with more than one thing happening at the same time.
- Surfing on the Internet while listening to music.

Multi-processing is when there are two or more processors running in the same system. ✓

Any ONE example: ✓

- Dual/Quad-core processors.
- Maths co-processor.

(4)

2.14 Pipelining allows the next instruction for processing to be fetched before the current instruction has finished executing. ✓✓

OR

Pipelining divides a process up into sections which each take the same time to execute. Several processes, calculations or instructions can be carried out, each at a different stage of processing.

(2)

TOTAL SECTION B: 50

SECTION C

QUESTION 3: E-COMMUNICATION

3.1 E-mail very large:

Cause: The attachment is very big. ✓

Solution: Use a compression program (zip) to reduce the size of the attachment (brochure). ✓

Could not open the attached brochure:

Cause: The clients do not have the program (or correct version) in which the brochure was created. ✓

Solution: Use a file format that is compatible. ✓

(4)

3.2 Any TWO: ✓✓

- Install an anti-spam program.

(2)

- Create and use rules and filters of e-mail program to prevent spam.
- Use an Internet Service Provider (ISP) that filters for spam.
- Make use of different e-mail addresses.

3.3 Any TWO of: ✓✓

- Fast.
- Cheap.
- Costs independent of distance.
- Can send information in electronic format.

(2)

3.4 Any TWO of: ✓✓

- Impersonal.
- Lacks feeling – no tone of voice, expression in voice, facial expressions.
- People 'hide behind' the medium.

(2)

[10]

QUESTION 4: SOCIAL AND ETHICAL ISSUES

4.1 No, licences are normally issued per computer. ✓✓

OR

Yes, if they purchased a site licence.

(2)

4.2 Any TWO: ✓✓

- Look at the dates of publications.
- Cross-referencing with other websites.
- Try to check the background/credibility of the authors.
- Check if the page is sponsored and by whom.
- Check the links to other sources.
- Check if the material is biased.
- Check if the information can be confirmed with other sources.
- Check if the source is a reliable one e.g. a university.

(2)

4.3 It is normally accomplished by sending an e-mail to someone that apparently comes from a 'genuine' company such as a bank. ✓ It tries to hoodwink the user into providing bank account numbers and other personal information. ✓

(2)

4.4 Any ONE advantage: ✓

- Exposure to bigger markets.
- Cheap way to advertise.
- Lower overhead costs (less manpower).
- 24/7/365 availability.

Any ONE disadvantage: ✓

- Only have exposure to clients who have internet access.
- Costs to create and maintain a website/experts needed.

(2)

[8]

TOTAL SECTION C:

18

SECTION D: PROGRAMMING AND SOFTWARE DEVELOPMENT

QUESTION 5: ALGORITHMS AND PLANNING

5.1

5.1.1 A primary key is a field in a database table where the value is unique for every record in the table. ✓ (1)

5.1.2 There is no field that will definitely have a unique value for every record. ✓✓ (2)

5.1.3 Any TWO reasons: ✓✓

- Easier to apply data validation.
- Database provides more powerful searching/sorting functions.
- Provides functionality which is either difficult or impossible to find in a spreadsheet.
- Can provide better restrictions of access to data by the user in terms of security/integrity.
- Database is specifically designed to store and process records.

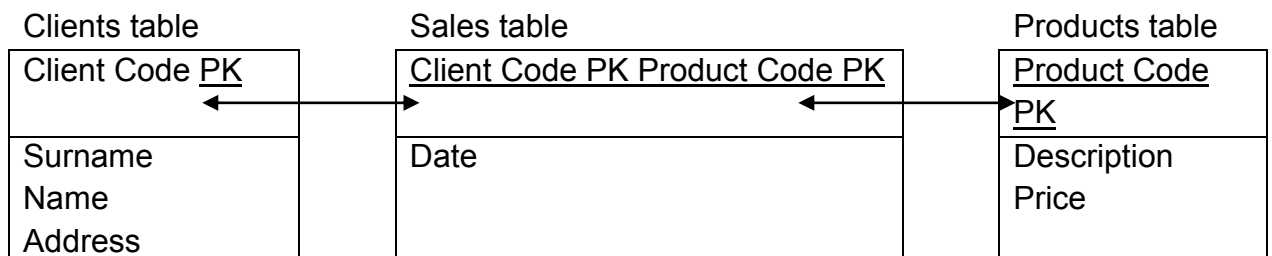
(2)

5.1.4 Any TWO reasons: ✓✓

- Hinders effective searching.
- Impossible to delimit fields.
- Cannot use lookup fields e.g. for a postal code based on the suburb.
- Difficult to enforce formatting convention rules.

(2)

5.1.5



- Clients, sales and products tables shown with all the necessary fields.

✓✓✓

- Primary keys added for clients and products tables. ✓✓

- Sales table uses primary keys of the clients and products

(6)

tables. ✓

TOTAL SECTION D: 13

SECTION E: INTEGRATED SCENARIO

QUESTION 6

6.1 Any THREE: ✓✓✓

- Sharing of hardware resources.
- Sharing of data/software.
- Facilitating e-communication.
- Improves control and makes administration easier.
- Better security. (3)

6.2 Any TWO: ✓✓

- The aim of a server is to provide resources.
- Not normally used as a workstation.
- Better specifications than a workstation. (2)

6.3 Any THREE: ✓✓✓

- Use a combination of letters, digits and special symbols.
- Use uppercase and lowercase characters.
- Ensure that the password consists of at least five to eight characters.
- Do not use information or names that can be easily guessed. (3)

6.4 Any THREE: ✓✓✓

- Back-up only data, not programs.
- Only back-up files which have been changed since the previous back-up operation.
- Use a program to compress (zip) the files.
- Remove duplicates. (3)

6.5 Any ONE advantage: ✓

- No cabling required.
- Quick and easy to add components to the network.
- Provides mobility in terms of access points.

Any ONE disadvantage: ✓

- Slow.
- Security concerns (eavesdropping).
- Varying strengths of signal.
- Requires reasonable amount of knowledge to set up.
- Susceptible to interference. (2)

6.6

- 6.6.1 A search engine is a type of software that creates indexes of Internet sites based on the titles of files, keywords, or the full text of files. ✓✓ The search engine has an interface that allows a user to search the indexes of Internet content and returns matches to the search parameters in the form of lists of pages that match the query. ✓✓ (4)
- 6.6.2 Any TWO reasons: ✓✓
- Different search engines use different methodologies to scour the Internet for new content.
 - The indexes created may differ in terms of how the material is classified.
 - The search algorithm will differ from one search engine site to another.
 - The algorithm for ranking the order of pages/sites returned may differ. (2)
- 6.6.3 Any THREE: ✓✓✓
- Make use of Boolean operators to include or exclude words.
 - Try to use other synonyms for existing words.
 - Restrict the search to a domain e.g. South Africa (.za) or .org.
 - Specify date ranges.
 - Use quotation marks.
 - Use an advanced search.
 - Be specific/use keywords. (3)
- 6.6.4 Any TWO: ✓✓
- Bluetooth works with radio signals and infra-red with light.
 - Bluetooth can work over longer distances.
 - With Bluetooth the receiver does not have to be in line with the sender. (2)
- 6.6.5 No, ✓ an intranet only offers access to employees/members of the company/organisation to which the intranet belongs. ✓ An extranet also allows access to people from outside the company/organisation. ✓ (3)
- 6.7 Any TWO: ✓✓
- Accelerates the process at the point-of-sale.
 - More accurate.
 - Can be linked to a stock control program. (2)

- 6.8 The use of a defragmentation program could improve the performance of the computer but it will not create more (free) disk space. ✓✓
It does not need to be done daily (very time-consuming) and an analysis of the hard drive can be done from time to time to see if it is necessary to defragment or not. ✓✓ (4)
- 6.9
- 6.9.1 A firewall is designed to prevent unauthorised access to a network or computer as well as allowing authorised connections. ✓✓ (2)
- 6.9.2 Each client can only connect to the Internet with the help of the proxy server. ✓ The proxy server examines each request in terms of IP addresses and protocols and in this way approves the request or turns it down. ✓✓ (3)
- 6.9.3 A proxy server caches the websites previously downloaded. ✓ The proxy server will first try to open the requested webpage from its local cache before it tries to download the webpage from the Internet. ✓ (2)
- 6.10 Any TWO: ✓✓
- The grip (how it fits in the hand).
 - The type of operating system.
 - Lifespan of the batteries.
 - Number of slots for removable memory cards.
 - Built-in applications. (2)
- 6.11 Any THREE: ✓✓✓
- Use of passwords.
 - Assignment of user rights.
 - Creation of user groups.
 - Biometric devices. (3)

- 6.12
- 6.12.1 Any TWO of: ✓✓
Cheaper than iPad, free Android software. (2)
 - 6.12.2 Wi-Fi radio technology and 3G cellular. (2)
 - 6.12.3 WiMax range is 20 to 30 km and Wi-Fi 100m.✓ (1)
 - 6.12.4 iOS. (1)
 - 6.12.5 They can use dropbox. When you open a file in dropbox and work on it and open it from dropbox on another device, the same copy would be in both devices. You use the Internet to save virtually. (2)
- 6.13
- 6.13.1 VoIP. (1)
 - 6.13.2 Skype. (1)
 - 6.13.3 You need a password to connect to Wi-Fi. (1)
 - 6.14.1 Radio frequency identification – for e-tag, travel docs, bus tickets, timing at sport events, identification tags implanted on animals. (3)

[59]

TOTAL SECTION E: 59

GRAND TOTAL: 150