COMPUTER APPLICATIONS TECHNOLOGY: PAPER I

MARKING GUIDELINES

Time: 3 hours   150 marks

These marking guidelines are prepared for use by examiners and sub-examiners, all of whom are required to attend a standardisation meeting to ensure that the guidelines are consistently interpreted and applied in the marking of candidates' scripts.

The IEB will not enter into any discussions or correspondence about any marking guidelines. It is acknowledged that there may be different views about some matters of emphasis or detail in the guidelines. It is also recognised that, without the benefit of attendance at a standardisation meeting, there may be different interpretations of the application of the marking guidelines.

SECTION A

QUESTION 1

1.1   1.1.1 Zombie Computers

        1.1.2 BotNet

        1.1.3 GPS

        1.1.4 Anti-spam

        1.1.5 Meme

1.2   1.2.1 Garbage In Garbage Out **OR** the results (information) of a process are only as reliable as the data that is input.

        1.2.2 A physical location OR device where people may obtain Internet access (typically using Wi-Fi technology).

        1.2.3 An object used to transfer heat away from an electronic device (e.g. CPU) **OR** an object used to keep an electronic device cool.

        1.2.4 A standard for the connection of peripherals whereby devices can be plugged into a computer system without having to switch the computer off.

        1.2.5 The name of a computer (server) hosting websites on the Internet **OR** a device accessing the Internet **OR** the website itself.

QUESTION 2

2.1   C
2.2   B
2.3   B
2.4   C
2.5   A
2.6   C
2.7   D
2.8   A
2.9   D
2.10 C

SECTION B

QUESTION 3   SYSTEM TECHNOLOGIES

3.1

Question Number	Name of Device	Main Function
3.1.1	Power Supply.	Supplies appropriate voltage to the computer system.
3.1.2	Webcam *(Accept Computer Camera)*.	Input and digitising of (moving) images.
3.1.3	Central Processing Unit *(Accept CPU)*.	Microchip that controls all functions of the computer.
3.1.4	(Internal Electromechanical) (Hard) (Disk) Drive *(Do not accept HDD)*.	Secondary (Permanent) Storage Device.
3.1.5	(LCD/LED) Monitor **OR** Screen.	Display **OR** Output of Information.

3.2   3.2.1   Control Unit, Arithmetic Logic Unit, Registers OR L1 cache

3.2.2   **Dual Core** has 2 processing units within its physical processor. **Quad Core** has 4 processing units within its physical processor.

3.2.3   **Multiprocessing** allows the CPU to operate on multiple programs simultaneously **OR** at the same time since it has more than one microprocessor in its core **OR** Dual/Quad/Octal Core.
Multitasking allows the CPU to appear to operate on multiple programs simultaneously by one core allocating processing time to multiple programs.

3.3   3.3.1   Cache memory holds the next instruction to be processed **OR** any repeated instructions. Therefore, it speeds up the processing since the data has less distance to travel to get to the CPU.

3.3.2   Inside the CPU block **OR** L1 cache **OR** internal cache memory.
Outside the CPU block **OR** L2 cache **OR** external cache memory.

3.4   Virtual memory increases the size of the available RAM by using part of the hard disk drive storage. The operating system will load the extra program instructions into the virtual memory and when they are needed by the CPU, the instructions are swapped with instructions in the RAM that are no longer needed. *(Give 1 out of 2 marks if Page swapping is answered. **OR** This is called 'page swapping' between RAM and the hard disk.)*

QUESTION 4   INTERNET AND NETWORK TECHNOLOGIES

4.1   Star Topology

4.2   4.2.1   Accept any **TWO** from:
- Control of the network is better since all software is processed by the server.
- The network administrator can set up access levels and permissions for different users at a single point.
- When software needs to be updated/loaded, it will only need to be updated/loaded on the server.
- If one node is broken, the network will still function.
- It is easier to find and repair a faulty node.

4.2.2   Accept any **TWO** from:
- More hardware is needed as a dedicated server needs to be purchased.
- It is advisable to have a network administrator as more control is required.
- More cabling is needed due to the layout of the network.
- More expensive to set up than other topologies.
- If the central server goes down, the whole network crashes.

4.3   4.3.1   Hub

4.3.2   Bridge OR Switch

4.4   4.4.1   It is a network of computers **OR** a LAN solely accessed within a company or organisation.

4.4.2   It provides good security for confidential information **OR** secure e-mail communications.

4.5   A modem is an older networking device used to connect to a network via a telephone line not a fibre cable. She will need a (Wi-Fi or cabled) fibre router.

4.6   Log in name **OR** User name **OR** ID **OR** e-mail.
Password **OR** PIN (Personal Identification Number)

QUESTION 5   INFORMATION MANAGEMENT

5.1   5.1.1   Accept any **ONE** from:
- Microphone
- Sound sensor/detector

         5.1.2   Accept any **ONE** from:
- CO_2 monitor **OR** sensor **OR** detector **OR** sampler **OR** collector.
- NO_2 monitor **OR** sensor **OR** detector **OR** sampler **OR** collector.
- General gas detector **OR** sensor **OR** sampler **OR** collector.

         5.1.3   Accept any **ONE** from:
- Thermometer
- (Thermocouple) Temperature monitor **OR** sensor

5.2   Accept any **TWO** from:
- Use portable devices (to download data each month from solid state memory).
- Transmit data to remote computer at research site automatically over cellular network. OR Use cloud storage
- Use a telephone network and manually connect to data logger and request it to send data over Internet link.

5.3   Accept any **TWO** from: *(Accept any correct questions)*
- Are the noise levels above the acceptable limits?
- Is CO_2 present in the air sample?
- Is NO_2 present in the air sample?
- Are the CO_2 levels above the acceptable limits?
- Are the NO_2 levels above the acceptable limits?
- Is the temperature of the air above expected levels?
- Is the weather different to predicted weather types?
- Are there any other unknown gases present in the air sample?
- Are these unknown gases identifiable?
- Are these unknown gases poisonous?
- Are these unknown gases adding to the Greenhouse Effect?
- Are these unknown gases causing a temperature rise?

5.4   Spreadsheets and Databases. *(DO NOT ACCEPT BRAND NAMES)*

5.5   Accept any **TWO** from: *(Accept any correct answers)*
- Most recent data compared to last two or three months' data already stored in database or spreadsheet.
- Graphs drawn showing results over last two or three months.
- Graphs produced showing results for every month over last four years.
- Compare results/graphs with 'normal' data.
- Use of 'average' or 'trend' function on graphs.
- Use of 'rolling average' to show changes over long period.
- Use data to predict noise and air pollution levels in five years, ten years.

5.6   Accept any **ONE** from**:** *(Accept any correct answers)*
- Restrict flight times to daylight hours.
- Line the sides of the runways with sound baffles (buffers).
- Surface the runways with sound baffles.
- Restrict airlines to using a more greenhouse friendly fuel (e.g., biofuels).
- Restrict airlines to using the most up-to-date, fuel efficient engines.
- Move the airport to a more rural location.
- Allow only airplanes with poisonous gas scrubbers in the engines to use the airport.

QUESTION 6   SOCIAL IMPLICATIONS

6.1   6.1.1   Accept any **TWO** from: *(Note: 1 mark for the advancement **OR** development **OR** improvement **AND** 1 mark for the effect it has had on the S.A. government)*
- Advancements in database technology have enabled the S.A. government to collate and monitor statistical information more quickly and accurately.
- Improved cellular communications technology has enabled the S.A. government to communicate with its citizenry more effectively.
- Improved banking **OR** financial security technology has allowed the S.A. government to fairly control and maintain the country's finances.
- National networks development can allow voting to take place more efficiently and accurately. **OR** Voting management can be improved.
- Social media network development has made the S.A. government operate in a more open and transparent manner.
- Development of national network grids has allowed the S.A. government to control the electricity supply more equitably.
- Development of radar information technology has enabled the defence capabilities to be improved.
- Development of encryption methods has allowed the S.A. government to send its sensitive data via public networks.

        6.1.2   Accept any **TWO** from:
- All information obtained must be fairly and lawfully processed through the Courts of Law.
- The information obtained can only be used for a specific purpose.
- The information obtained should only be enough for the purpose it was needed.
- The information obtained must be accurate.
- The information obtained should not be kept longer than necessary.
- The information should be obtained and processed in accordance with the subject's rights as set out in the S.A. Constitution.
- The information obtained should be kept secure and protected from unlawful use.
- The information obtained should not be given to anyone or any other department without a legitimate reason or without adequate protection.

6.2   Accept any **TWO** from:
       (Mark for the effect development has on a commercial business.)
- Computer-Aided Design.
- Recruitment of employees
- Improvements in database technologies, spreadsheets, and word processing software – to store company records.
- Automation of manufacturing processes.
- Online advertising (Social media presence)
- Faster access to customers via an Internet presence **OR** e-mail **OR** Instant Messaging.
- Lower administration costs (electronic office).
- Video conferencing for international businesses.
- Security **OR** encryption improvements have benefitted financial transactions.
- Customers can be targeted based on their interests.
- Virtual Private Networks (VPN) for the company staff to work anywhere.

QUESTION 7   SOLUTION DEVELOPMENT

7.1   Using the answer cell as part of the formula **OR** Circular Reference Error **OR** the initial value of u has not been used.

7.2   = SQRT (A2*A2+ 2 * B2 * C2)

7.3   = SQRT(A6 *A6 + 2 * B6 * C6)   Do not penalise again if answer 7.2 was incorrect. Carry the error.

7.4   = LARGE (D2:D6 ,2)

7.5   = SQRT(A2*A2 + 2 * 9.8 * C2)
                                          Do not penalise again if answer 7.2 was incorrect. Carry the error.
7.6   = SQRT(A2*A2 + 2 * E1 * C2)

7.7   Absolute (Cell) Referencing

SECTION C

QUESTION 8   INTEGRATED SCENARIO

8.1   8.1.1   You did not create the images/theme/concept yourself, therefore using them would be illegal **OR**
The images/themes/concepts are copyrighted **OR** copyright infringement **OR** you do not own the images/theme/concept.

        8.1.2   Contact the owners of the copyright **OR** get permission from the copyright owners.
Pay (a licencing fee) for using their images/theme/concept **OR** share profits with the copyright owners.

8.2   8.2.1   System B

        8.2.2   Accept **THREE** from:
- Faster CPU microprocessor
- Faster RAM
- More RAM
- Dedicated Graphics Card **OR** Graphics with its own GPU **OR** RAM

        8.2.3   Accept **ONE** from:
- Headphones
- Speakers
- Audio input device **OR** Microphone
- Graphics tablet
- Webcam **OR** Video Camera

8.3   8.3.1   Accept **ONE** from:
- (Wireless) webcam
- Smart device with built in webcam

        8.3.2   Resolution **OR** MP (MegaPixel) rating **OR** number of pixels.
Amount of internal storage.

8.4   Accept **ONE** from:
- External hard drive
- USB memory stick *(must state greater than 32 GB storage)*
- MicroStorage *(must state greater than 32 GB storage)*
- Cloud Storage

8.5   8.5.1   Accept **ONE** from:
- Movie Maker
- Wondershare
- Pinnacle Studio 16 Ultimate
- AVS Video Editor
- Adobe Premiere Elements 11
- Final Cut Pro X 10.0.3
- iMovie 11
- Corel VideoStudio Pro X6
- CyberLink PowerDirector.
- Magix Movie Edit Pro 2013 Plus
- Accept any legitimate video editor

8.5.2 Accept **ONE** from:
- Windows Media Player
- VLC Media Player
- DivX Media Player
- Real Player
- iTunes Player
- QuickTime Player
- Accept any legitimate media player

8.6

Question Number	Field Name	Data Type	Validation Rule
8.6.1	Gender	Text	Is field = 'Male' or 'Female'?
8.6.2	Previous Acting Experience?	Yes/No **OR** Boolean	Is field = Yes or No?
8.6.3	Salary	Currency	Is field < R1000?

(Accept any validation rule that validates the inputted data to the type.)

8.7   8.7.1 Accept **TWO** from:
- RSI (Repetitive Strain Injury) **OR** CTS (Carpel Tunnel Syndrome)
- Eye strain **OR** Headaches
- Back strain **OR** Neck strain

8.7.2 Accept **TWO** from: *(Must match those chosen in 8.7.1)*
- Regularly stretch your fingers and wrists **OR** buy an ergonomic keyboard.
- Regularly look up from screen and focus on a distant object for a few moments.
- Regularly get up and stretch back and body **OR** buy an ergonomic chair **OR** ensure that when seated, you look slightly down onto your screen.

8.8   8.8.1 Accept **TWO** from:
- Facebook
- Twitter
- YouTube
- Social Networking Sites *(Only award this mark if they have not answered any of Facebook, Twitter, YouTube)*
- SMSs **OR** WhatsApp messaging **OR** Instant Messaging
- Advertise on a well-visited website **OR** Pay Google's fee for searching
- Commercial advertising in print media

8.8.2 Flaming

	Question Number	Possible Cause	Possible Solution
8.9	8.9.1	You have been infected by malware **OR** your secondary storage is full **OR** you are running too many programs at once **OR** there is a hardware problem, e.g. overheating. OR the HDD is fragmented	Run an anti-virus program **OR** clean up and delete unwanted files on your storage **OR** close unnecessarily running programs **OR** repair or replace the faulty hardware or get a better cooling system OR defragment the HDD OR restart the system
	8.9.2	There is an error in a program that is part of your startup **OR** you do not have the latest updates for a critical program **OR** your operating system has been corrupted.	Uninstall or repair faulty startup program **OR** update your software to its latest version **OR** update your operating system to its latest version **OR** restore your system to a running version **OR** re-install your operating system.
	8.9.3	Your computer is not plugged in **OR** your power supply is not working **OR** the CPU is faulty **OR** the motherboard is faulty **OR** a critical piece of hardware has failed.	Plug your computer in **OR** replace the faulty hardware.
	8.9.4	The graphics card/circuitry is faulty **OR** there is not enough RAM to run such a high definition video **OR** your media player is faulty. OR graphics cannot support the set resolution OR the graphics driver is faulty	Replace the faulty graphics card/circuitry **OR** install more RAM **OR** re-install your media player OR reset the resolution OR restart the system/update driver
	8.9.5	Your speakers are faulty **OR** you have turned the volume down completely **OR** the speakers are not plugged in properly. OR the sound driver is faulty	Replace the faulty speakers **OR** turn the volume up **OR** plug the speakers in correctly OR restart the system/update driver

(Accept any legitimate cause and solution for each situation.)

8.10   8.10.1   **Direct Download** means you first transfer and save the media file completely on your computer and then watch it **OR** download the media file completely first and then watch it offline.

        8.10.2   **Streaming** describes the act of playing media on one device when the media is saved on another. The data is transmitted to your computer and you watch it while it is downloading.

8.11   8.11.1   Internet Service Provider

        8.11.2   Accept any **TWO** from:
                  • E-mail accounts
                  • Cloud storage
                  • Malware filtering
                  • Technical support
                  • Telephone Voice service
                  • FTP service

8.12   8.12.1   Encryption codes data **AND** so that it appears to be meaningless **OR** it will need a decryption key to be understood.

        8.12.2   Accept any **TWO** from:
                  • Provides security for sensitive data.
                  • Protects against results of unauthorised access **OR** hacking.
                  • Prevents data from being understood by hackers.

        8.12.3   Check to see that the URL (web address) is a secure address **OR** the URL contains https **OR** there is a closed lock on the bottom of the web page **OR** the site uses such security measures as Verisign.

Total: 150 marks