



INTERNATIONAL SECONDARY CERTIFICATE EXAMINATION
MAY 2025

COMPUTER STUDIES: PAPER II

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 A

1.2 C

1.3 C

1.4 B

1.5 D

1.6 C

1.7 B

1.8 A

1.9 D

1.10 A

QUESTION 2

2.1 2.1.1 AutoNumber

2.1.2 Bookmark

2.1.3 <h1>

2.1.4 Star

2.1.5 Absolute

2.2

2.2.1	K
2.2.2	I
2.2.3	A
2.2.4	J
2.2.5	G

- 2.3 2.3.1 An **Input Mask** is a string of characters in a database that constrains user input.
- 2.3.2 **Optical Character Recognition (OCR)** converts typed or written text into editable text, usually from a scanner.
- 2.3.3 **Fibre-optic cable** is a (optional high-speed) network cable that transmits data using light pulses.
- 2.3.4 **Metadata** is data that describes data **OR** provides information about the properties of a data set / file / image / document / database / video / artist name.
- 2.3.5 **Convergence** is the integration of multiple functions into a single device.

SECTION B

QUESTION 3 SYSTEM TECHNOLOGIES

3.1 3.1.1 Any **TWO** factors:

- Number of cores.
- Cache size/memory
- Clock speed/cycle.

3.1.2 Any **TWO** facts:

- Improves gaming.
- Plays better video.
- Frees up memory.
- Better 3D performance.
- Faster video rendering.
- Higher frame rates.
- Higher refresh rates.
- Higher resolutions.

3.1.3 Any **ONE**:

- To provide the CPU quick access (short-term memory) to data and instructions for executing programs and performing tasks.
- Temporarily store data or programs currently being worked on.

3.1.4 (a) Any **TWO**:

- SSDs have quicker access times.
- SSDs have lower latency.
- SSDs take three times less to boot up.
- SSD file opening speeds are up to 30% faster.
- SSD transfer speeds are faster.
- SSDs can support simultaneous tasks and applications.
- SSDs are more reliable and durable because they have no moving parts.

(b) KB – Kilobyte EB – Exabyte

3.2

	Name of cable/port	Port (letter)
3.2.1	HDMI	B
3.2.2	Audio/Auxiliary	E
3.2.3	USB-A/USB	A
3.2.4	Ethernet / Network / LAN / RJ45	C

3.3 3.3.1 Any **ONE**:

- Keep track of the update history.
- Benefit from new improvements or features.
- To ensure compatibility with their operating system.
- Protects against security threats.

3.3.2 (a) Any **ONE** difference: 32-bit 64-bit

- 32-bit software can handle smaller data sets and less complex calculations than 64-bit software.
- 32-bit software processes data slower than 64-bit software due to a smaller memory address space.
- 32-bit software is more likely to be compatible with older hardware or operating systems than 64-bit software.

(b) Any **ONE**:

- Check the operating system version.
- Check the software requirements.
- Check your hardware for compatibility.

3.3.3 Wizard

3.3.4 Any **ONE** difference: freeware software proprietary software

- Proprietary software is copyrighted for sale to users. Freeware is copyrighted and free to download, use, and share.
 - Proprietary software comes with support and regular updates. Freeware may or may not have support and has infrequent updates.
- Proprietary software may not be shared. Freeware can be shared.

QUESTION 4 INTERNET AND NETWORK TECHNOLOGIES

4.1 Any ONE:

- Amazon Music Unlimited
- Audiomack
- BBC Sounds
- Boomplay
- Deezer
- Google Play Music
- Idagio
- iRoking
- JioSaavn
- Las Gidi Tunes
- LiveXLive
- Mziiki
- Mkiti
- Mdundo
- MixCloud
- NamMusic
- Pandora Premium
- Playfre
- Primephonic
- Rockbot
- Qobuz
- SiriusXM Internet Radio
- 8tracks
- Gaana
- Wynn
- Raaga
- SwaziRhythm
- Shazam
- Simfy Africa
- Smubu
- Songa
- Soundcloud
- Spinlet
- Tigo
- uduX
- Vuga
- YouTube Music

4.2 Distribution method:

Broadcasting simultaneously transmits music over radio waves or another acceptable broadcasting method to multiple listeners.

Streaming delivers music over the Internet to individual users in real-time.

User experience:

Broadcasting is a passive user experience as they cannot choose specific songs.

Streaming is a more active user experience as they can access content on-demand.

4.3 Any **TWO** advantages:

- Stored in data centres, it doesn't take up space on the user's hard drive.
- Accessible on any device with an Internet connection.
- New features can be added quickly and efficiently to give users a better experience.
- Music is backed up on data servers, so data should be safe.
- Saves costs as users pay a monthly fee instead of purchasing the music.

4.4 4.4.1 Any **ONE** connection method:

- Bluetooth
- AUX cable
- USB cable
- Audio adapter

4.4.2 Any **THREE** steps depending on connection:

Step 1: Turn on Bluetooth on your smartphone and car if the car has built-in Bluetooth.

Step 2: Pair your smartphone with the car's Bluetooth.

Step 3: Launch the music streaming platform and select the song.

OR

Step 1: Locate the AUX input.

Step 2: Connect one end of the AUX cable to the AUX input and the other to the smartphone's headphone jack.

Step 3: Launch the music streaming platform and select the song.

OR

Step 1: Locate the USB port.

Step 2: Connect one end of the USB cable to the car's USB port and the other to the smartphone.

Step 3: Launch the music streaming platform and select the song.

4.5 Any **TWO** methods:

- Subscribe to premium for an advert-free experience.
- Install a VPN to encrypt your connection and block adverts.
- Install an ad blocker or anti-adware to block adverts.

4.6 4.6.1 A private browsing feature on most modern web browsers.

4.6.2 Any **ONE** benefit:

- Prevents listening history from being visible to others who may use the same account.
- Prevents anyone else from influencing users' recommendations.
- Prevents listening habits from being tracked.
- Avoid adverts by resetting their ad-free listening quote.

QUESTION 5 INFORMATION MANAGEMENT

5.1 5.1.1 A security measure requiring a user to enter two or more passwords or codes to gain access to an account.

5.1.2 Any **ONE**:

- One-time codes sent via the app, SMS or email.
- Biometric verification.
- Physical devices that use one-time verification.
- Push notification to verify the login attempt.

5.2 Any **TWO** data items:

- Location of the water leak.
- Image / photo / sketch showing the water leak.
- Description/type of the water leak.
- Date of water leak report.
- Contact details of the person reporting the water leak.
- Customer account number with the municipality.

5.3 Any **ONE**:

- Categorise the water leak by type / location / urgency.
- Prioritise the water leak based on the water supply in the area.
- Allocate resources to repair the water leaks.

5.4 Any **TWO**:

- A ranking of reported leaks by severity.
- A map of the location of leaks.
- Trends and frequency of leaks.
- User feedback, ratings and comments.
- Resource allocation list for leak repairs.

5.5 Any **ONE** (Spreadsheet):

- Use formulas and functions to analyse data, e.g. the number of leaks in a particular area.
- Create charts to show trends and patterns of water leaks.
- Sort water leaks based on severity.
- Remove duplicate data.
- Emphasise areas or other data by using conditional formatting.
- Filter by area, severity, etc.
- Create pivot tables to analyse leaks in an area over time, etc.

Any **ONE** (Database):

- Create queries to filter, sort and analyse data, e.g. the number of leaks over a specific time.
- Create professional reports to show leaks grouped by area and sorted by severity.

QUESTION 6 SOCIAL IMPLICATIONS

- 6.1 **Phishing:** a cyberattack in which an attacker sends a fraudulent message from what appears to be a legitimate source to obtain financial information, such as credit card details, ID numbers, etc., from the recipient.

Ransomware: a type of malware that prevents or limits a user from accessing their computer system until they have paid a ransom.

Botnets: a network of compromised computers that can be remotely controlled to perform large-scale malicious attacks.

- 6.2 6.2.1 Any **TWO** types of government services:
- Financial services, e.g. tax and welfare payments.
 - National security, e.g. military intelligence.
 - Infrastructure, e.g. electricity, transport, water supply.
 - Health care services, e.g. hospitals, clinics, sensitive medical data.
- (Accept suitable examples)*

- 6.2.2 Any **TWO** ways to protect citizens:
- Invest in cybersecurity infrastructure to detect and respond to threats.
 - Educate the citizens on cybersecurity issues.
 - Partner with other countries on cybersecurity agreements.
 - Encourage partnerships with private businesses.
 - Introduce cybersecurity laws to protect against cyberattacks.

- 6.2.3 **Right to privacy:** the right of a person to keep their personal information private and protected from any unauthorised parties.

Right to access: the right to access information held by the government or any organisation or person.

- 6.3 Any **TWO** IoT devices:
- Connected vehicles.
 - Smart home security systems.
 - Smart agriculture sensors.
 - Smart energy metres.
 - Smart wearables.
 - Sensors for monitoring water quality.
 - Smart home appliances.

QUESTION 7 SOLUTION DEVELOPMENT

7.1 7.1.1 Hypertext Markup Language

- 7.1.2 (a) **href** attribute indicates the destination of the hyperlink.
- (b) **<head>** tag is a container (element) for metadata about the HTML file, e.g. title, styles, keywords, etc.
- (c) **rowspan** attribute defines the number of rows a cell should merge.
colspan attribute defines the number of columns a cell should merge.
- (d) **<tr>** defines a table row
<td> defines a table cell

7.2

Feature	Page	Paragraph
Watermark	X	
Hyphenation		X
Indentation		X
Orientation	X	

7.3 7.3.1 Text to columns

- 7.3.2 **FIND(' ',A2)**
LEFT(A2, FIND(' ',A2)-1)
(Accept any suitable formula that finds the correct solution)

SECTION C

QUESTION 8 INTEGRATED SCENARIO

- 8.1 8.1.1 (a) Small dots that make up the image on the webcam.
- (b) Determines the sharpness and clarity/quality of the image.
- (c) Any **TWO** reasons:
- Protection against hackers accessing the webcam.
 - Physically impossible for the webcam to be operated remotely by spyware or malware.
 - For privacy purposes.
- (d) Any **TWO** examples:
- Livestreaming areas in their community, which are hotspots for poaching.
 - Recording or taking photos of poaching incidents.
 - Video calls with rangers and law enforcement.
- 8.1.2 (a) When many CPU processes appear to run simultaneously.
- (b) Any **THREE** reasons:
- Portable.
 - Thin and light/easy to carry around.
 - Battery life is 9 hours.
 - CPU can handle most light productivity tasks.
 - A webcam can be used for surveillance.
- 8.2 8.2.1 Any **ONE** reason with explanation:
- **Access to remote locations:** can fly over inaccessible areas by vehicle and collect real-time data.
 - **Cost:** more economical than aeroplane fuel.
 - **Monitor animal populations:** monitor several animals in various reserve areas.
 - **Quality of aerial imaging:** can take high-quality photographs and videos of poaching areas.
 - **Precision:** Drones can be guided to precise locations in the reserves.
 - **Ease of control and quick deployment:** if locations need to be found quickly in the reserves, drones are quick to deploy and easy to control.
 - **Night vision:** drones use infrared heat sensors to pick up the body heat of humans and animals at night.

8.2.2 Any **TWO** disadvantages with discussion:

- **Cost:** Drones are expensive to purchase.
- **Battery life:** Drones have limited battery life.
- **Privacy and spying:** Poachers may use drones to identify animals for poaching.
- **Vulnerable to wild animals:** can be attacked by wild animals.
- **Easy to hack:** Poachers could take control of the rangers' drones to access animal locations and other important information.
- **Weather-dependent:** Drones are vulnerable to weather conditions.

8.3 8.3.1 Any **TWO** types of data:

- Coordinates/location.
- Speed.
- Change of direction.
- Population size
- Habitat.
- Movement patterns.

8.3.2 Any **TWO** ways:

- Help rangers to track animals according to their location, habits and feeding spaces.
- If animals are being chased or suddenly change movement, it could result from poachers in the area.
- Microchips embedded in rhino horns or elephant tusks can help rangers track the stolen horns and tusks.
- If animals are stationary for an unnatural amount of time, they could be trapped in a poacher's snare.
- If animals have escaped the reserve, they can locate them before poachers catch them.

8.3.3 (a) Any **TWO** types of media:

- Photos
- Videos
- Websites
- Text messages
- QR codes

(b) Give away the animals' location (coordinates/location/time), making the animals easier to track.

(c) Any **ONE** function:

- Use websites to learn more about areas, e.g. shopping malls, places of interest and places to stay.
- Provides helpful insight into consumer activity, e.g. how customers interact with brands and organisations can provide specialised offers and messages.

QUESTION 9 INTEGRATED SCENARIO (continued)

- 9.1 9.1.1 Any **THREE** facts about RFIDs:
- The device/tag is implanted or embedded into the animal.
 - The tag contains an integrated circuit and an antenna.
 - Data is transmitted to the RFID reader via radio waves.
 - The RFID reader converts the radio waves to a usable form of data.
 - The information collected from the tag is transferred through a communications interface to a server, where data is stored in a database.
- 9.1.2 Any **THREE** reasons:
- NFC is short range 0,1 metres and unsuitable for tracking wildlife over large areas.
 - NFC tags are required to be physically attached to animals and can be damaged.
 - NFC tags can be physically tampered with, leading to a loss of data.
 - NFC tags have limited data storage, so extensive tracking data will not be stored.
 - NFC needs user participation, which might not be suitable for wildlife tracking.
 - NFC can only read one device at a time, which will not be suitable for tracking multiple animals.
 - NFC needs a stable power source which will be inaccessible in remote locations.
- 9.2 9.2.1 A **WAN** is a network that connects devices from multiple locations all over the world.
A **LAN** is a network that connects devices close to each other/or in a limited area.
- 9.2.2 (a) An IP address is a unique string of characters identifying each network device.
Any **ONE** example: IPv4 address: 192.158.1.38
OR IPv6 address, 2001:db8:3333:4444:5555:6666:7777:8888
- (b) A **server** is a computer that handles requests for data from other computers and hosts applications.
A **workstation** is a personal computer designed to perform application tasks.
- 9.3 9.3.1 Any **ONE**:
- Google Earth
 - Google Maps
- 9.3.2 Any **ONE** difference: web-based mobile-based
- Web-based runs on a web browser. Mobile-based operates on a mobile device.
 - No installation is necessary, as the program resides on a remote server for web-based applications. Mobile-based applications need to be installed from the app store.
 - Web-based needs an Internet connection. Mobile-based can be accessed offline.

- Web-based may take longer to load than mobile-based.
- Your computer's operating system does not limit web-based applications, whereas mobile-based applications are dependent on the operating system.
- Web-based systems are always kept up to date. Mobile-based applications need to be updated frequently.

9.3.3 (a) **CSV**: Comma-Separated Value files open in Excel and keep data in a format for importing and exporting, separated by commas. *(Do not only accept the expanded acronym)*

(b) **ZIP**: A compressed folder allows a user to put one or more files into one folder, which keeps several files together and reduces the size of a group of files.

9.3.4 (a) Any **TWO** design features:

- Screen Readers
- Voice Recognition Software
- Zoom Tool/Magnifier

(b) **Screen readers**: link the user to the computer and allow them to hear everything displayed on the monitor aloud.

OR Voice Recognition Software: analyses the user's sound and converts the sound into text.

OR Zoom Tool/Magnifier: Users can zoom the output on the screen at different magnifications from 100% to around 500%.

9.4 9.4.1 Any **TWO** examples of questions:

- The average number of rhinos/elephants poached in Namibia/South Africa from 2017 to 2021.
- The total number of rhinos/elephants poached in Namibia/South Africa from 2017 to 2021.
- The highest number of rhinos/elephants poached in Namibia/South Africa from 2017 to 2021.
- The lowest number of rhinos/elephants poached in Namibia/South Africa from 2017 to 2021.
- The percentage of rhinos/elephants poached in Namibia/South Africa from 2017 to 2021.

9.4.2 Any **TWO** tasks:

- Group-related fields.
- Filter data.
- Sort data.
- Expand and collapse data.
- Summarise data using basic functions, such as sum, average, count, max and min.

Total: 150 marks