



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

SENIOR CERTIFICATE EXAMINATIONS/ NATIONAL SENIOR CERTIFICATE EXAMINATIONS

INFORMATION TECHNOLOGY P2

MAY/JUNE 2024

MARKING GUIDELINES

MARKS: 150

These marking guidelines consist of 13 pages.

SECTION A: SHORT QUESTIONS**QUESTION 1**

1.1	1.1.1	B ✓	Solid-state drive	(1)
	1.1.2	C ✓	URL	(1)
	1.1.3	A ✓	Text file	(1)
	1.1.4	B ✓	12	(1)
	1.1.5	C ✓	Microblog	(1)
	1.1.6	B ✓	Quarantine	(1)
	1.1.7	C ✓	Augmented reality	(1)
	1.1.8	A ✓	Register	(1)
	1.1.9	C ✓	Firmware	(1)
	1.1.10	C ✓	Character	(1)
1.2	1.2.1	Zombie ✓		(1)
	1.2.2	Distributed computing ✓		(1)
	1.2.3	Semantic search ✓		(1)
	1.2.4	Foreign key ✓		(1)
	1.2.5	POP ✓ or POP3		(1)

TOTAL SECTION A: 15

SECTION B: SYSTEMS TECHNOLOGIES**QUESTION 2**

- 2.1 2.1.1 16 GB ✓ of RAM (1)
- 2.1.2 The refresh rate ✓ of the monitor. (1)
- 2.1.3 NVIDIA GeForce RTX 3060 ✓ (1)
- 2.1.4 Any ONE: ✓
• Makes it possible to practically work with more content on the same screen
• Better accuracy when working on intricate details and precise adjustments (photo and video editing) (1)
- 2.1.5 Any ONE: ✓
• Small – less dimension – suitable for a mobile device
• Use less power than conventional hard drives
• Less possible damage – no moving parts (1)
- 2.2 Any THREE: ✓✓✓
• Mobile devices can rely on battery life when there is no power available. ✓ (Always on)
• Mobile devices can use LTE instead of relying on a Wi-Fi connection. (Always connected)
• Mobile devices are more portable and can easily be carried around.
• Supports convergence (many functions built into one device)
• Convenience of direct input (3)
- 2.3 2.3.1 Plug and play ✓ (1)
- 2.3.2 Driver ✓ (1)
- 2.4 2.4.1 Ransomware is malware that encrypts/locks data. ✓
The victim must then pay the ransom to have their data decrypted/unlocked. ✓ (2)
- 2.4.2 Any TWO: ✓✓
• Use Antivirus/Anti-malware
• Use firewall
• Keep software updated
• Educate employees and users
• Block known malicious websites
• Email protection (2)

- 2.5 2.5.1 *Any TWO: ✓✓*
- Allows you to access your data everywhere
 - Frees up physical storage space on storage devices
 - A reliable way to back up data
 - Data stored online can be shared more easily
 - Prevents data loss in case hardware is stolen/damaged - acts as an offsite back up
- (2)
- 2.5.2 A disadvantage of using an incremental back-up is that when you want to carry out a complete restore ✓, the most recent full backup and all of the subsequent incremental copies must be restored. ✓
OR
More time consuming (1) to perform a full system restore. (1)
- (2)
- 2.6 2.6.1 *Any TWO: ✓✓*
- Display caters for an audience over a large area
 - Screen size/display is adjustable
 - Less expensive than a large screen
 - Can be projected onto existing structures
- (2)
- 2.6.2
- | Any ONE connection method: ✓ | Any ONE motivation: ✓ |
|-------------------------------------|--|
| | |
| HDMI/DisplayPort | <ul style="list-style-type: none"> • Can transmit video and audio signals in a single cable • High quality display • Universal port in modern devices |
| | |
| Wireless connection | <ul style="list-style-type: none"> • Mobility • No cable cost |
| | |
| VGA | <ul style="list-style-type: none"> • Cheaper than HDMI cable |
- (2)
- 2.7 Minimum system requirements are the minimum specifications required for software to be able to run ✓, but performance may be poor. ✓
- Recommended system requirements are the specifications required to ensure optimal performance from the software. ✓
- (3)

TOTAL SECTION B: 25

SECTION C: COMMUNICATION AND NETWORK TECHNOLOGIES**QUESTION 3**

- 3.1 Any ONE: ✓
- Sharing of hardware resources
 - Centralisation of data
 - Transfer of files
 - Increase control and security
 - Flexible access
 - Leisure
- (1)
- 3.2 Any FOUR of the following: ✓✓✓✓
- Encryption makes data unreadable to outsiders
 - Browser obtains public key from secure site
 - Digital certification of site is checked
 - Session key/data is encrypted with public key
 - The secure site holds a private key that is mathematically tied to public key
 - Private key is never sent over network
 - Session key/data is decrypted using private key
 - All data transferred is encrypted – using session key
- (4)
- 3.3 3.3.1 (a) Connects devices in a network to a central location ✓ so that communication can occur. ✓
- Any TWO concepts
- Connects devices to a central point
 - It directs traffic
 - Allows communication to take place
- (2)
- (b) A device that makes it possible for networks to communicate over the internet ✓, by directing the data to its correct destination. ✓
- (2)
- (c) A device that converts the data or signal ✓ from a computer to a format that can be transmitted over a specific communication medium. ✓
- (2)
- 3.3.2 A firewall acts like a barrier between your computer and the internet. ✓. The firewall check which programs are trying to access your computer through the internet, or trying to access the internet through your computer, and blocks the access where it is not approved ✓
- Concepts:
- Monitors communication between network and Internet.
- Blocks unwanted communication/threads to the network.
- (2)

- 3.4 3.4.1 Direct communication between two devices (peer devices) without relying on a central server. ✓

Therefore, the load is distributed across multiple connections, reducing strain on the studio's servers, and potentially speeding up the transfer process. ✓ (2)
- 3.4.2 File Transfer Protocol (FTP) is a client/server protocol used for transferring large files or folders✓ It can be secured with user names and passwords and allows you to access an FTP site✓ (2)
- 3.5 **Shaping:** Prioritise specific services over others ✓to prevent crucial services from experiencing a delay✓

Throttling: Limit the speed or rate of data transmission for certain activities ✓ to prevent network excessive/unfair data use and network congestion ✓ (4)
- 3.6 3.6.1 IoT refers to the network of physical objects embedded with sensors, software, and connectivity ✓ allowing them to collect and exchange data over the internet. ✓ (2)
- 3.6.2 Any TWO of the following (or any other suitable application):✓✓

 - Lighting/Air conditioning
IoT can be used in the gaming studio, where lighting, temperature, and other factors can be automatically adjusted.
 - Projectors to view the games – can automatically switch to different screens depending on the level/stage of the game.
 - Security cameras to enhance the security/avoid unauthorised actions or participants entering the studio. (2)

TOTAL SECTION C: 25

SECTION D: DATA AND INFORMATION MANAGEMENT**QUESTION 4**

- 4.1 4.1.1 Database normalisation is the process of organising data in a database/adapting design ✓ in order to eliminate anomalies and data redundancy. ✓ (2)
- 4.1.2 (a) Create a foreign key ArtistID in tblShows ✓ that references the primary key field of tblArtists. ✓ (2)
- (b) NumberOfShows ✓ because the number of shows can easily be derived using existing data. ✓ (2)
- 4.1.3 Logical integrity refers to how accurate and consistent the data in a database is. ✓
 OR
 Logical integrity refers to the correctness of data in a database. (1) (1)
- 4.2 Any TWO: ✓✓
 • Access control and security
 • Attendee tracking
 • Cashless payments
 • Interactive experiences
 • Inventory management/control

 Also accept other relevant and correct examples (2)
- 4.3 4.3.1 Any TWO: ✓✓
 • When the centralised database is offline, potentially no users can work with / access the database (Single point of failure)
 • Concentration of traffic can slow down performance
 • Large amounts of traffic can lead to large data costs (2)
- 4.3.2 Use of a distributed database system. ✓ (1)
- 4.4 Any ONE person ✓ and role: ✓
 • Database administrator, manages the access rights and security
 • Database developer, designs the structure of the database
 • Database programmer, create the database and queries
 • Database project manager, manages and supervises all aspects relating to a specific database (2)
- 4.5 A data warehouse stores a large quantity of historical data ✓ and all the data from the various databases are available ✓.

 A database is a collection of interrelated data ✓ / current data. ✓ (4)

- 4.6 4.6.1 Data that is entered by the user (hacker) is manipulated to change the meaning of the SQL ✓ providing access to data in the database that should not be allowed. ✓ (2)
- 4.6.2 *Any TWO: ✓✓*
- Validating user input
 - Implementing access rights
 - Using restrictive GUI components/selection components
 - Using parameters in the SQL instruction (2)

TOTAL SECTION D: 22

SECTION E: SOLUTION DEVELOPMENT**QUESTION 5**

- 5.1 Any TWO components ✓✓ with correct motivation. ✓✓
 • Edit box to select the channel can be replaced with a combo box (or spin edit) (1) so that the user can't type in the wrong values (1)
 • The radio group for the TV Volume can be replaced with a spin edit (or slider) (1) to save space/provide more space on the GUI (1) (4)
- 5.2 5.2.1 With the Assignfile-statement the internal file tFile/file variable ✓ is linked to the external file 'countries.txt' on disk/storage ✓
 OR any other correct explanation. (2)
- 5.2.2 The EOF-marker will not be available since the Append(tFile) statement will open the file for adding onto the file/writing and the file marker will be at the end of the file. ✓
 OR any other correct explanation. (1)
- 5.2.3 The text file will be empty ✓
 OR any other correct (more technical) answer is provided. (1)
- 5.3 Input iLower & Input iUpper
 Loop ✓ K from 1 to iLower ✓
 Test if (iLower mod K = 0) ✓ AND ✓ (iUpper mod K = 0) ✓
 iTempHCF ← K ✓
 Display iTempHCF ✓ (7)
- 5.4 5.4.1 Line 7 (1)
- 5.4.2 In the code, the current array item is compared to the next item in the array ✓. If the for loop runs to the last item in the array the comparison will exceed the size of the array/compare with an item that does not exist/get(show) an "array index out of bounds" error. ✓ (2)
- 5.4.3 The given code performs a swapping algorithm ✓ using a temporary variable to swap two elements in an array.
 • It stores the value of the element at arrNames[i + 1] in the array in a temporary variable called sTemp. ✓
 • Then the element at arrNames[i] in the array is overwritten by the value of element at arrNames[i + 1] in the array ✓
 • The name stored in sTemp is now retrieved and written back to arrNames[i]. ✓
 OR illustrating the 3 steps using a diagram (3) (4)

TOTAL SECTION E: 22

SECTION F: INTEGRATED SCENARIO**QUESTION 6**

- 6.1 ANY TWO functions ✓✓ and descriptions: ✓✓
- **It provides an interface.**
The interface allows users to interact with the computer and with programs on the computer. This is how we communicate with the computer. Modern software, including operating systems, all use a visual or graphical user interface (GUI).
 - **Process and task management:**
It manages the CPU and how it runs programs – i.e. which programs and tasks can use the CPU and for how long.
 - **Memory management:**
Controls how programs use the memory (RAM) – i.e. by making sure that programs don't try to use the same area of memory at the same time and so corrupt each other's data or instructions.
 - **Input/output management:**
Controls how programs use the input and output devices – i.e. which programs receive input from input devices and which programs can use an output device at any given time.
 - **Disk and storage management:**
How the data is organised on the storage device and how or when programs access the storage device. (4)
- 6.2 6.2.1(a) Cores are processing units✓ that is placed on a CPU. ✓
OR
A processing core can support 2 pipelines (1) in each core that supports hyperthreading. (1) (2)
- 6.2.1(b) A thread is a smaller part ✓of a single program. ✓ (2)
- 6.2.2 Multiprocessing: ✓
Processes more than one program/thread on separate cores✓ at the same time making processing faster. ✓
OR
The operating system divides the programs into threads or processes (1) The operating system splits these processes between the separate cores inside the CPU chip. (1) (3)
- 6.2.3 The GPU manipulates and controls the display of graphics ✓which makes the CPU more available for other task to be performed ✓
OR
The GPU processes graphic intensive tasks (1)
which makes the workload for the CPU less. (1) (2)

- 6.3 A single computer can be configured with different virtual machines running multiple computing environments'. ✓

Any TWO reasons: ✓✓

- They will be able to run different video editing software on different operating systems. / To be able to test different video editing software in different environments on more than one computer with different hardware and different operating systems that need to be used.
- They will be able to configure the hardware to produce the best results.
- It is possible to create these different environments on a single computer - can install different operating systems and software and even change the amount of memory, storage space and CPU power available to a specific VM at any time.

Advantage: The cost will be reduced because there won't be extra computers to buy. ✓

Concepts:

What is virtual machine (1)

How can it be used by the club (different platforms/different hardware) (2)

Advantage of using virtual machines (1)

(4)

- 6.4 Virtual memory is an area of disk space ✓ which is set aside so that the operating system can temporarily store data ✓ that cannot be loaded into memory when memory starts filling up.

Adding more RAM to your system will ensure that the need of virtual memory will be less. The process of writing data between RAM and virtual memory takes time and that is the reason why the computer is running slower.

Concepts:

Where is virtual memory (1)

Used by operating to save data when RAM is limiting (1)

Solved by adding more RAM (1)

Why it affects the speed (1)

(4)

- 6.5 6.5.1 SaaS refers to applications that are hosted in the cloud ✓ and that users pay a monthly subscription to access. ✓ (2)
- 6.5.2 Any THREE of: ✓✓✓
- The club will not need to spend a large amount of money on software initially.
 - They will always have the latest version of the software
 - The hardware requirements will be lower as processing takes place in the cloud
 - It will be easier for the club members to collaborate
 - Club members can work from home on the video editing projects. (3)
- 6.5.3 Fast/stable Internet connection. ✓ (1)
- 6.6 6.6.1 Any ONE of: ✓
- Can watch immediately
 - Do not need storage space (1)
- 6.6.2 Name ✓✓ and discuss ✓✓ any TWO of:
- Authority – check who the author is – what credentials and/or affiliation.
 - Accuracy – cross reference the data or information with other sites and sources, including those given on the site.
 - Currency – check whether the information (and links) on the web page are up to date.
 - Objectivity – does the information appear unbiased (not one-sided)? (4)
- 6.7 6.7.1 Intellectual property is property created by someone's mind or intellect, including literary and artistic works etc. ✓ (1)
- 6.7.2 Any TWO of: ✓✓
- He does not have permission to share the work of somebody else.
 - He needs to give credit to the producers of the video.
 - The persons that was photographed did not give permission (POPI act)
 - Privacy of the learners. (2)

6.8	6.8.1	Webinars are events, video presentations, workshops, seminars, training sessions, or classroom lectures hosted and delivered online using webinar software. ✓ These occur in real-time and allow 'delegates' to access interactive conferences and online workshops as if they were physically present at a seminar. ✓	(2)
	6.8.2	The club members can attend the webinar without having to travel to the United Kingdom. ✓	(1)
	6.8.3	Lossless compression compresses data without losing any data. It allows the exact original data to be reconstructed. ✓ Lossy compression compresses data by 'losing' some of the data. It works because the detail that is lost is not perceptible to human senses (sight/hearing). ✓ Lossy compression will be used because you will not really see the difference when the video file is viewed again. ✓	(3)
TOTAL SECTION F:			41
GRAND TOTAL:			150