

# Need an amazing tutor?

[www.teachme2.com/matric](http://www.teachme2.com/matric)



Collected and collated by

**teachme2**



# **basic education**

---

Department:  
Basic Education  
**REPUBLIC OF SOUTH AFRICA**

## **SENIOR CERTIFICATE EXAMINATIONS/ NATIONAL SENIOR CERTIFICATE EXAMINATIONS**

**INFORMATION TECHNOLOGY P2**

**2022**

**MARKING GUIDELINES**

**MARKS: 150**

**These marking guidelines consist of 13 pages.**

**SECTION A: SHORT QUESTIONS****QUESTION 1**

- |     |       |   |               |     |
|-----|-------|---|---------------|-----|
| 1.1 | 1.1.1 | B - Bluetooth ✓   |               | (1) |
|     | 1.1.2 | D - cookie ✓  |               | (1) |
|     | 1.1.3 | A - Expert system ✓   |               | (1) |
|     | 1.1.4 | C - extremely high volumes of traffic that request data from the website. ✓ |               | (1) |
|     | 1.1.5 | D - ytoje ✓✓  |               | (2) |
| 1.2 | 1.2.1 | K ✓   | Cyberbullying | (1) |
|     | 1.2.2 | F ✓   | iOS           | (1) |
|     | 1.2.3 | E ✓   | RSI           | (1) |
|     | 1.2.4 | A ✓   | Algorithm     | (1) |
|     | 1.2.5 | H ✓   | Spam          | (1) |
|     | 1.2.6 | D ✓   | Hyperlink     | (1) |
|     | 1.2.7 | R ✓   | Machine Cycle | (1) |
|     | 1.2.8 | C ✓   | Machine code  | (1) |
|     | 1.2.9 | L ✓   | GIGO          | (1) |

**TOTAL SECTION A: 15**

**SECTION B: SYSTEMS TECHNOLOGIES****QUESTION 2**

- 2.1.1 a) DIMM slot ✓ (1)
- b) *Any TWO functions of a motherboard:* ✓✓  
 • Houses components (also accept specific components)  
 • Connects components / communication  
 • Provides power/distributes power to components (2)
- c) Increased use of virtual memory will result in data being accessed at a slower/lower rate ✓  
 Instructions and data are fetched at a slower rate from storage than from RAM ✓
- OR
- Decreased use of virtual memory/more instructions and data can be stored in RAM  
 Instructions and data are fetched faster from RAM than from storage (2)
- 2.1.2 A core is a single/separate processor on a CPU chip ✓ (1)
- 2.1.3 *Any ONE type of storage device used to increase storage space:* ✓  
 • SD card / memory card (1)
- 2.1.4 *Why would device C would be the most suitable device to scan QR codes:*  
 Mobility/portability ✓  
 Access to camera/ front and rear facing camera/built in camera ✓ (2)
- 2.1.5 Central Processing Unit (CPU) ✓ (1)
- 2.1.6 *Any ONE motivation for having a dedicated graphics card:* ✓  
 • Needed for graphics intensive applications (Video editing / CAD)  
 • Improve overall performance  
 • Reduce the processing load on the CPU  
 • Crypto mining (1)
- 2.2.1 *Any ONE for what is modular design:* ✓  
 • Computer is built up from separate modules/ parts  
 • An indication that the computer consists of individual components (1)
- 2.2.2 *Any ONE reason for using modular design:* ✓  
 • Components can be combined according to your needs  
 • Easy to upgrade/replace  
 • Easy to repair (1)

- 2.3.1 Any TWO properties of CPU cache memory: ✓✓  
 • High speed memory/static memory  
 • Memory on the CPU  
 • Stores frequently used instructions/stores instructions likely to be used next (2)
- 2.3.2 Any TWO other types of caching that is used on a computer system:  
 Web caching ✓  
 Disk caching ✓ (2)
- 2.4.1 A Trojan is malware disguised as useful software ✓  
 A user is tricked into installing ✓ the Trojan with the assumption that they are installing useful/legitimate software
- CONCEPTS:  
 • Malware disguised as useful/legitimate software  
 • Activated by action from the user (installing/downloading) (2)
- 2.4.2 A firewall monitors/controls/filters traffic ✓ (incoming & outgoing) on a network/internet and prevents unauthorised communication/access ✓ (2)
- 2.5 Difference between software update and patch:  
 An update fixes code/adds new features/enhances security to software ✓  
 A patch removes software bugs/replacing incorrect code/removes vulnerabilities in code ✓ (2)
- 2.6 Any TWO ways to free up storage space: ✓✓  
 • Use a disk clean-up tool/example of disk clean-up  
 • Remove duplicate files  
 • Uninstall/remove unused software/applications  
 • Empty the recycle bin  
 • Compress data not frequently used  
 • Archive files/data  
 • Move data/files to cloud storage/external device (2)

**TOTAL SECTION B: 25**

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

- 3.1 3.1.1 Any ONE type of cable used in wired LAN: ✓  
 • UTP/Ethernet cable (CAT 5/6/7)  
 • Fibre (1)
- 3.1.2 Any ONE type of media used to transmit in WiMAX: ✓  
 • Radio waves  
 • Electromagnetic waves (1)
- 3.1.3 Wi-Fi ✓ (1)
- 3.2 3.2.1 VPN (Virtual Private Network) ✓ (1)
- 3.2.2(a) IP address:  
 A unique address/code that identifies a device ✓ on a network. (1)
- 3.2.2(b) Purpose of a DNS:  
 To obtain the correct IP-address for a specific URL/linking URL's to IP-addresses ✓ (1)
- 3.2.3 The NIC encodes/decodes data ✓ that is transmitted across a network ✓
- OR
- Provides a network hardware port for the computer to allow for data transmission over a network (2)
- 3.2.4 Intranet is a network similar to the Internet/browser based network ✓ of which the access is limited to a specific organisation ✓ (2)
- 3.3 3.3.1 Any ONE characteristic of streaming: ✓  
 • The immediate and real-time delivery of media content to a receiving device  
 • The file is not saved to the storage devices media, but only played on the device  
 • Live viewing/ Video on demand (1)
- 3.3.2 Any ONE way to prevent unauthorised viewing: ✓  
 • Use on a closed channel/do not connect to a larger network  
 • Use a login/password to control access the content (1)

- 3.4      3.4.1      You will find “HTTPS” in the URL ✓ (1)
- 3.4.2 (a)   Changing the format of data ✓ using a mathematical formula/key to prevent unauthorised access ✓
- OR
- Any TWO properties of encryption (SSL):*
- The public key is used to encrypt the data.
  - The data can only be decrypted using the specific private key.
  - The private and public unique matching keys are provided by complex mathematical algorithms.
  - The private key never travels on network and therefore cannot be intercepted. (2)
- 3.4.2 (b)   The CA verifies that the business or organisation is valid. ✓ (1)
- 3.5      *Difference between functions of a router and modem:*
- A modem converts the format of a signal for a specific communication medium. ✓
- A router determines the best/correct route ✓ for the transmission of a message/communication between two points on a network. ✓ (3)
- 3.6      3.6.1      Semantic Search ✓ (1)
- 3.6.2      *Purpose of using SEO:*
- To ensure that a search engine ✓ will place the company’s site higher up in the order of search results. ✓ (2)
- 3.7      3.7.1      FTP (File Transfer Protocol) ✓ (1)
- 3.7.2      *Any ONE type of file sharing service: ✓*
- Cloud storage
  - BitTorrent
  - Git/Git hub
- Also accept examples of Cloud Storage like Google Drive, One Drive etc. (1)
- 3.7.3      *Any ONE benefit of using online file storage services: ✓*
- accessible from many devices/places
  - collaboration/sharing
  - Saving on local storage space
  - Servers take responsibility for creating a backup of the files (1)

**TOTAL SECTION C:      25**

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

- 4.1 It is the primary key. ✓ (1)
- 4.2 *Primary key:*  
Must be unique ✓  
Cannot be empty/have a null value/required field ✓ (2)
- 4.3 IDNumber ✓ (1)
- 4.4 *Suitable data type for the VehicleRegNumber and motivation:*  
Short Text (any text data type) ✓  
A vehicle registration number contains numbers and letters ✓ (2)
- 4.5 *Why should name and surname be split into two fields:*  
There is more than one piece of information in the field ✓  
OR  
Any indication that it might be necessary to separately work with the name and surname values (1)
- 4.6 4.6.1 Data redundancy refers to the unnecessary repetition of data ✓ (1)
- 4.6.2 Normalisation ✓ (1)
- 4.7 4.7.1 *Example of useful information extracted from the data:*  
  
Establishing the frequency of offences/most common offence/least common offence ✓  
  
*Accept any relevant or correct answer of information gained from the table* (1)
- 4.7.2 *How can step 3 & 4 in the data progression diagram be applied:*  
  
A logical solution ✓ linked to the information obtained ✓  
Example - Increase policing at stop signs  
  
Also accept other correct examples based on the information from QUESTION 4.7.1 (2)
- 4.7.3 Fuzzy logic deals with reasoning that works with probabilities. ✓  
  
Drivers not stopping at stops are reckless drivers/there are many reckless drivers in the community ✓  
  
Also accept any other correct example (2)

- 4.8      4.8.1      *SQL injection:*  
A hacking technique where SQL statements are entered ✓ into data input fields ✓ instead of data. (2)
- 4.8.2      *Audit trail:*  
A record or 'trail' that is made to keep track of who ✓ made changes to a database and when ✓ those changes were made. (2)
- 4.9      4.9.1 (a)      Logical integrity ✓ (1)
- 4.9.1 (b)      Physical integrity - ensuring that data is protected against damage from power surges, natural disasters, theft, etc. ✓ (1)
- 4.9.2      *Any TWO ways to ensure the date is entered in the correct format. ✓✓*  
                     • Provide a list/component to select from/date picker/calendar  
                     • Specify format in input component/ghost text  
                     • Format/Data type check/applying a validation rule  
                     • Input mask (2)
- 4.10      *How is transaction processing used to maintain data integrity:*  
                     • In transaction processing, transactions that are dependent on one another to work are grouped together. ✓  
                     • The transaction will only be completed if all the individual transactions are successful. ✓  
                     • If any one of the parts/instructions are unsuccessful, everything will be rolled back. ✓ (3)

**TOTAL SECTION D:      25**

**SECTION E: SOLUTION DEVELOPMENT**

- 5.1 5.1.1 2 ✓ (1)
- 5.1.2 0-9 ✓ A-F ✓ (2)
- 5.2 5.2.1 Any ONE reason for using an array vs variable: ✓  
 • When working with a large number of values/variables  
 • An array can store multiple values  
 • A variable can store only one value (1)
- 5.2.2 Any ONE reason why names and ages cannot be stored in array provided: ✓  
 • An array can only store values of one specific data type  
 • Names and ages are represented by two different data types  
 • The provided array can only store integer values (1)
- 5.2.3 Loop k index 10 ✓ down to 7 ✓  
 arrNum[k] ✓ ← arrNum[k-1] ✓ OR Loop k index 9 down to 6  
 arrNum[6] ← 92 ✓ arrNum[k+1] ← arrNum[k]  
 arrNum[6] ← 92 (5)
- 5.3 5.3.1 (a) FALSE ✓ (1)
- (b) TRUE ✓ (1)
- (c) FALSE ✓ (1)
- 5.3.2 An accessor returns the value of an attribute ✓ of an object and a mutator changes the value of an attribute ✓ of an object. (2)

Number	Factor	Loop	Number mod Loop = 0	Factor = 1	Output
4					
	0				
		2			
			True/Yes		
	1				
		3			
			False/No		
		4			
			True/Yes		
	2				
				False/No	
					4 is NOT a prime number
	✓	✓	✓	✓	✓

Notes:

- Values may be placed in the same line as long as progression of algorithm is clear.
- Mark with fault by penalising for the faulty value in that column only. (5)

**TOTAL SECTION E: 20**

**SECTION F: INTEGRATED SCENARIO****QUESTION 6**

- 6.1      6.1.1      *Crowd funding:*  
The practice of funding a project or venture by raising money from a large number of people ✓ who each contribute a small amount, typically via the internet/social networks. (1)
- 6.1.2      (a)      *Any TWO reasons of using technology to automate the assembly of new vehicles: ✓✓*
- Safer work environment
  - Fewer people employed/cost saving
  - Greater precision/consistency of repetitive tasks
  - Greater efficiency
  - Improved productivity
- Also ACCEPT other valid answers. (2)
- (b)      *How could a learning algorithm be used to improve the manufacturing and sale of new vehicles:*
- A learning algorithm observes the current processes/trends that are followed ✓, for example, colour preference of vehicles, also extras that are popular, creates a set of rules based on the observation ✓ and creates an optimal process that can be implemented. ✓
- CONCEPTS:
- Studying/observing current processes/trends
  - Creating a set of rules
  - Creating an optimal process (3)
- 6.2      6.2.1      Radio Frequency Identification ✓ (1)
- 6.2.2      *Any TWO ways how passive tags work: ✓✓*
- Energy from reader's radio signal at tollgate powers the tag
  - Tag sends a signal that the reader uses to identify the specific tag
  - Amount is automatically deducted from tag holder's account (2)
- 6.2.3      (a)      GPS ✓ (1)
- (b)      *Any ONE reason why active tags will be needed for satellite tracking: ✓*
- The signal needs to be transmitted over longer distances
  - Stronger signal needed to communicate with satellite
  - Signal needs to be transmitted continuously (1)

- 6.3      6.3.1      *Uncapped:*  
 Unlimited amount of data that can be used in a month ✓  
 OR  
 No limit on amount of data used. (1)
- 6.3.2      *Any ONE reason for installing fibre rather than mobile LTE: ✓*  
 • Fixed location internet has a lower cost per GB than mobile LTE  
 • Fibre might have faster connection speeds depending on the speed of the package  
 • Using a lot of data  
  
 Also ACCEPT other valid answers. (1)
- 6.3.3      Router/ONT ✓ (1)
- 6.3.4      *Will the 70GB Night Surfer Data hold a benefit for the company:*  
 Yes, backup/update procedures can be done overnight ✓✓  
 OR any other applicable motivation  
  
**OR**  
  
 No. Outside office hours  
 OR any other applicable motivation (2)
- 6.4      6.4.1      (a) *Rootkit:*  
 Software designed to obtain administrator rights to a computer for unauthorised access. ✓ (1)
- (b) *Any ONE risk to data due to rootkit: ✓*  
 • Opens the computer for hacking/illegally accessing data files  
 • Creating backdoors for other malware  
 • Used as a bot for launching attacks on other computers and networks.  
  
 Also ACCEPT other valid answers. (1)
- 6.4.2      *Social engineering:*  
 An attempt to manipulate or con someone ✓ into installing malware or giving out sensitive personal information. ✓ (2)
- 6.4.3      *Any ONE way that anti-virus software identifies malware: ✓*  
 • The anti-virus software scans the files to identify known threats using virus signatures/definitions  
 • Looks for pieces of code that is unique to specific viruses. (1)

- 6.5      6.5.1      *Any TWO ways that AI can be used when working with big data: ✓✓*
- Find possible connections among datasets
  - Recognize knowledge using natural language processing
  - Can be used to automate and accelerate data preparation tasks
  - Can learn common human error patterns
  - Detect and resolve potential flaws in information
  - Can learn by watching how the user interacts with an analytics program
  - Can identify data types
  - It can alert users to anomalies or unexpected patterns in data
  - Identify potential threats from system logs or social networking data
- Also ACCEPT other valid answers. (2)
- 6.5.2      With the duplication model, each separate site has a complete copy of the entire database stored. ✓  
With the partitioning model, each site stores and manages only the part of the database it works with. ✓ (2)
- 6.5.3      (a) *Purging:*  
Deleting/removing records ✓ permanently from a database. (1)
- (b) *Any ONE reason why records will need to be purged: ✓*
- To limit the size of the database file.
  - Remove obsolete/redundant/outdated records
  - Improve the performance of the database (1)
- 6.6      6.6.1      Virtualisation is the use of software ✓ to create an entity that only exist for as long as the software is being run. ✓ (2)
- 6.6.2      *Any ONE benefit of virtualisation: ✓*
- Saving on hardware
  - Can run software written for other platforms
  - Convenience of not having to keep multiple devices (1)
- 6.6.3      *Is it compulsory for the company to pay for the additional proprietary operating system:*
- Yes, ✓ the user must pay for the operating system to avoid committing piracy ✓ (2)
- 6.6.4      *TWO ways in which virtualisation is applied to make scalability of services possible:*
- Combining the resources of many machines into one powerful service ✓  
Sharing the resources of one powerful machine between many users ✓ (2)

6.7.1 Any ONE reason to frequently change a password: ✓

- For security reasons
- Prevent access to your account due to password leaks

Also ACCEPT other valid reasons.

(1)

6.7.2 Any TWO reasons why *mfundi* is not a strong password: ✓✓

- Password too short/must be more than 8 digits
- Only lowercase characters/must contain an uppercase and lowercase letter, number and special character
- Can easily be guessed/do not use personal information

(2)

6.7.3 (a) How can Quantum computing can be used in the statistical process of preventing the spread of a virus:

It is used to easily query, monitor, analyse and act on data ✓, regardless of the source.

(1)

(b) Any TWO problems of cloud computing which are solved using Edge computing: ✓✓

- Bypasses the latency caused by cloud computing.
- Acts as mini data centres which cloud computing lacks.
- Used to process time-sensitive data in remote locations with limited or no connectivity to a centralised location.

(2)

**TOTAL SECTION F: 40**  
**GRAND TOTAL: 150**