



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

**NATIONAL
SENIOR CERTIFICATE**

GRADE 12

INFORMATION TECHNOLOGY P2

NOVEMBER 2018

MARKING GUIDELINES

MARKS: 150

These marking guidelines consist of 17 pages.

SECTION A: SHORT QUESTIONS**QUESTION 1**

- | | | | |
|-----|-------|--|-----|
| 1.1 | 1.1.1 | D ✓ | (1) |
| | 1.1.2 | B ✓ | (1) |
| | 1.1.3 | D ✓ | (1) |
| | 1.1.4 | A ✓✓ | (2) |
| | 1.1.5 | Faulty question – no possible answer | |
| 1.2 | 1.2.1 | CMOS ✓ (Also accept: BIOS, Firmware) | (1) |
| | 1.2.2 | Biometrics/Bio authentication/Any specific correct example such as Voice recognition, Face/Iris/Fingerprint- <u>scanning</u> ✓ | |
| | | Do not accept: Digital fingerprint, only fingerprint/face/iris | (1) |
| | 1.2.3 | Digital signature ✓ | (1) |
| | 1.2.4 | Utility ✓ software | (1) |
| | 1.2.5 | Constructor ✓ | (1) |
| | 1.2.6 | Normalisation ✓ | (1) |
| | 1.2.7 | Trace table ✓ | |
| | | Also accept: watch facility of the built-in debugger, debugger | (1) |
| | 1.2.8 | Lossy ✓ compression | (1) |

TOTAL SECTION A: 13

SECTION B: SYSTEM TECHNOLOGIES**QUESTION 2**2.1 *Any TWO ✓✓*

- Portable/could walk around to the tables and take orders
- Small in size/easy to fit into hand
- No cabling/Wireless/Can link to system using Wi-Fi
- Touch screens make selecting options quick/easy to use
- Saves time/quicker order taking/billing

There must be a reference to a feature of a tablet relating to placing orders

Do not accept: any reference to cost/cheaper

Do not accept: general answer applicable to any device

Do not accept: answers related to the software/GUI

(2)

2.2 2.2.1 *Any TWO hardware components ✓✓*

- CPU/Processor
- Hard drive/storage
- Memory/RAM
- Motherboard

(2)

2.2.2 *Any TWO actions for disk cleanup ✓✓*

- Deletes the temporary internet files
- Empties the recycle bin
- Deletes any other temporary files
- Deletes downloaded files
- Debug dump files
- Delete setup log files
- Delete system error memory dump files
- Delete unused/unnecessary/unwanted files

(2)

2.3 2.3.1 *Any TWO comparisons between cache and RAM+ ✓✓*

- Cache is faster than RAM
- Cache has smaller capacity than RAM
- Cache stores recently used instructions/has a pre-fetch unit while RAM stores the whole program
- Cache found on CPU and RAM on motherboard
- Cache is more expensive per MB than RAM
- Cache is SRAM/static and RAM is DRAM/dynamic
- It is easier to upgrade RAM

(2)

- 2.3.2 The device driver facilitates communication ✓ between the computer and the printer/hardware ✓
OR
The device driver allows the operating system/computer to communicate/control/manage the hardware/printer
OR
The device driver converts the basic instructions of the operating system/computer to messages that can be interpreted by the hardware component.
- Concepts:**
- Communication/converting instructions
 - Hardware/printer (2)
- 2.3.3 To license the use of the software/prevent illegal copies of software from being used ✓
OR
Make all/licensed features of the software available (1)
- 2.3.4 (a) *Any ONE advantage of installing updates: ✓*
- Always have latest functions/features
 - Bugs and problems are resolved
 - Security loopholes are fixed
 - Increase performance/work faster (1)
- 2.3.4 (b) *Any ONE disadvantage of installing updates automatically: ✓*
- Unexpected/unplanned use of data
 - A hastily released update may cause more problems than it fixes/lose existing/familiar/pre-set features
 - Unwanted features/preferences
 - Slows system down (due to background processes)
 - Unwanted restart/inconvenient timing of update (1)
- 2.3.5 (a) When RAM fills up/is full ✓ (1)
- 2.3.5 (b) The operating system makes use of hard drive space ✓ as extra RAM ✓
- OR**
- Uses (dedicated) area on HDD/storage
 - Moves unused data to HDD/virtual memory where it will easily be accessible again (2)

2.4	2.4.1	<p><i>Any ONE:</i> ✓</p> <ul style="list-style-type: none"> • Physical damage • Power surge <p>Also accept examples of physical damage such as dropping a PC can cause a hard drive head crash while transporting/Spilling water on motherboard or HDD with PC case open</p> <p>Do not accept: Any example or mention of data being damaged</p>	(1)
	2.4.2	UPS/Invertor ✓	(1)
	2.4.3	<p><i>Backup:</i> A duplicate copy ✓ of a file is created on another device/for use when the original copy is damaged or lost ✓</p> <p><i>Archiving:</i> ✓ Less frequently used/outdated/older files (can be compressed) and stored where they can be retrieved when necessary</p>	(3)
	2.4.4	Monitors communication with computer/system and the internet/other networks✓ and blocks unauthorised communication✓ by software/malware	(2)
TOTAL SECTION B:			23

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

3.1 *Any TWO advantages of networks ✓✓*

- Fast and efficient communication
- Centralisation of data/data always up to date
- Transfer of files between devices
- Leisure/LAN computing games/Watching movies
- Increased control and security

(2)

3.2 3.2.1 An NIC is used to encode or 'convert' the data so that the data can be transmitted over a specific medium and it decodes the data that is received.

Concepts:

- Decode/Encode ✓
- Making communication between devices possible ✓ over a network

(2)

3.2.2 Radio waves ✓

(1)

3.3 3.3.1 Fibre Optic cables ✓

(1)

3.3.2 *A reason and explanation for addressing poor signal strength: ✓✓*

A device/technique with a valid explanation

Also accept : Any TWO of the following-

- Provide sufficient/multiple access points
- Interference by structures should be limited by strategically placing access points/line of sight
- Use a repeater/booster/amplifier/device/router to increase signal strength/WiMax
- Limit the noise by making use of different frequencies

(2)

3.3.3 *Any TWO reasons for using WiMax: ✓✓*

- Greater range
- Faster/faster communication
- Provides higher bandwidth/data transfer
- Better security

(2)

- 3.4 3.4.1 The Semantic Web refers to a web where the content has been optimised for computers and devices to filter content intelligently to be able to navigate without human intervention or involvement.
- Concepts:** Any TWO for Semantic web ✓✓
- Content optimised
 - Filter content intelligently
 - Without human involvement (2)
- 3.4.2 *Any ONE reason for using metadata:* ✓
- To supply additional data on which specific searches are done.
 - Searching is optimised
 - Improved results
- Accept any explanation that metadata is used to improve results on specific searches. (1)
- 3.5 3.5.1 POP3 ✓ (1)
- 3.5.2 Notification – The user is notified ✓ by a sound or message that a new e-mail has arrived
Push Technology – The user receives the e-mail ✓/is notified and the e-mail is automatically downloaded to the device (2)
- 3.5.3 A link/folder ✓ is shared ✓ with another user.
- Concepts for making large files available:**
- Folder/Link provided
 - Storage shared (2)
- 3.5.4 (a) Phishing is a technique to obtain personal/sensitive information ✓ from a user that appears to be from a legitimate institution in order to trick the user into providing information. ✓
- Concepts of phishing:**
- Provide information about self
 - Appears to be legitimate/tricking you (2)
- 3.5.4 (b) *Any ONE example of phishing:* ✓
- Request to confirm bank details
 - Request to provide pin number for bank cards
 - Request to confirm user name and provide password
 - Request personal information (1)

TOTAL SECTION C: 21

SECTION D: DATA AND INFORMATION MANAGEMENT**QUESTION 4**4.1 *Any ONE example of the role of a database in a POS ✓*

- When a transaction takes place, the database is updated to increase or reduce the stock items/items available/Relevant data obtained at POS is stored for the restaurant
- Customers details are updated as they pay for meals
- Accounting information is updated as customers pay
- Obtain the (latest) item information/prices from the database
- Can do calculations/generate statistics

OR

Any other valid example to do with data in a sales environment (1)

4.2 4.2.1(a) *Any ONE ✓*

- String
- Text

4.2.1(b) *Any ONE ✓*

- Boolean
- YesNo
- True/False

4.2.2 The table will be sorted according to initial and not surname. ✓

OR

The waiter's initial and surname are captured in one field/Initials captured as the first section of the initial and surname field. (1)

4.2.3

	tblJobCard	
PK	JobCardNr	✓(a)
	NormalHoursWorked	
	WeekStartDate	✓(b)
	HoursOvertime	✓(b)
FK	WaiterID	✓(b)

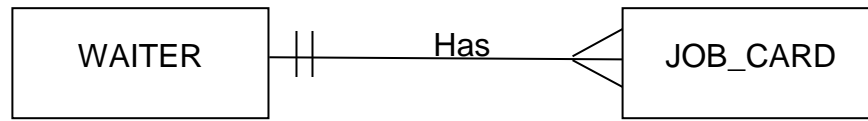
(b) ✓ TotalHours is NOT included

(c) ✓ FK correctly identified

NOTE:

The field names may differ from those in the above table (6)

4.2.4 One Waiter has many Job cards



Mark allocation

- ✓ Correct ER diagram format
 - ✓ One (Waiter) to many (Job_Card) relationship
 - ✓ Placing entities in correct relationship/order
- (3)

4.3 4.3.1 Any ONE issue that threatens physical integrity ✓

- Power failure
 - Natural disasters
 - Mechanical failure of hardware
 - Theft of devices
- (1)

4.3.2 Any TWO aspects to ensure logical integrity: ✓✓

- Data validation/validation rules
 - Each record has a unique primary key
 - Normalisation rules applied
 - Ensuring referential integrity/Foreign key must refer to an existing record in the other table
 - Verification of data
- (2)

4.4 Any THREE responsibilities of a database administrator: ✓✓✓

- Design the database
 - Security of the database/access rights
 - Backup and restoration plans and policies/updating software
 - Monitoring the performance of the database
 - Manage/maintain the database.
- (3)

4.5 TWO benefits of having a server DBMS:

Managing simultaneous multiple connections to the database to execute the transactions/It will allow a large number of users to connect simultaneously to a database

Concepts:

- Multiple connections/users✓
 - Simultaneous access✓
- (2)

- 4.6 4.6.1 *Any ONE reason for security: ✓*
- Data is transmitted across networks
 - Multiple servers are used/Many systems are used
 - Create security exposure on multiple fronts/many users (1)
- 4.6.2 *Any ONE benefit of working with a distributed database: ✓*
- Faster performance /less congestion
 - Less downtime
 - If connection is interrupted, database is not damaged/corrupted (1)
- 4.6.3 *Partitioning:*
Each site manages its own part of the database ✓ and uploads data to a central database in a scheduled batch process. ✓
- Concepts:**
- Local data
 - Uploaded to central database (2)

TOTAL SECTION D: 25

SECTION E: SOLUTION DEVELOPMENT

QUESTION 5

5.1 5.1.1 Any TWO guidelines for readable code: ✓✓

- Commenting of code
- Descriptive variable names
- Modularity
- Indentation
- Open lines between sections
- Collapsible regions (2)

5.1.2 An algorithm is a possible solution to a problem ✓ which contains a set of steps/instructions ✓

Concepts:

- Set of steps/instructions
- To perform a task/solve problem (2)

5.1.3 (a) Debugging is the technique/process of finding ✓ and resolving ✓ defects/problems/errors/bugs. (2)

5.1.3 (b)(i) A runtime error is an error that causes termination or break in the running of a program. ✓

Do not accept: Prevents from running (1)

5.1.3 (b) (ii) Any ONE example of runtime error: ✓

- Division by 0
- Data type mismatch/typing in a word instead of a number
- Reference to an index in an array that is not part of the declaration
- Attempting to access a resource/file that is not available.

Also accept other valid examples. (1)

5.1.4	WHILE...DO	REPEAT...UNTIL	
	Executed while condition is true	Executed until condition is true	✓
	The statements may not be executed at all depending on the condition	Executed at least once irrespective of condition	✓

(2)

5.1.5 Statement 1: variable X := 5 mod 2;
Integer/Real/Any number type ✓

Statement 2: variable Y := 5 mod 2 = 0;
Boolean ✓ (2)

5.2 5.2.1 Creates a link between the external/physical/textfile file ✓ and file variable/logical file ✓ in the program (2)

5.2.2 Any ONE reason for replacing append with rewrite ✓✓

- The file will be emptied/ the contents will be removed
- OR**
- Rewrite statement will replace/overwrite the current contents of the text file with Mrs Smith.

Do not accept: create a new file (2)

5.2.3 Any ONE reason for I/O Error: ✓

- The file was not closed in during a previous procedure/The file buffer was not cleared/The file is corrupt
- The file was not correctly assigned
- Append or rewrite was not used to open the file/Reset was used to open the file
- Writeln-statement does not refer to the text file (example: writeln(sline))
- The executable file is not in the same directory/folder as the text file
- The file was closed

(1)

5.3 5.3.1

PIN	x	c	Is x < 1?	Is c <>5?	Display
623	623	0			
	62.3✓				
		1✓			
			False✓		
	6.23✓				
		2✓			
			False✓		
	0.623✓				
		3✓			
			True✓		
				True✓	
					Error in PIN ✓
No extra details ✓					

(12/2 = 6)

5.3.2 Any ONE of: ✓

- c = 5
- The user must enter a pin number which contains 5 digits.

(1)

5.4 **Marking Concepts:**

- 1 mark – Inner loop
- 1 mark – Loop to correct counter
- 1 mark – Formulate a display
- 1 mark – Display in correct position
- 1 mark – Reset display variable/ move to next line

Line	Algorithm_Display_Pattern
1	Input number
2	Loop counter \leftarrow 1 to number
3	output \leftarrow " ✓
4	Loop counter2 ✓ \leftarrow 1 to counter ✓
5	output \leftarrow output + counter2 ✓
6	EndLoop counter2
7	Display output ✓
8	EndLoop counter

Concepts:

- 1 mark – Clear output variable in correct position
- 1 mark – Inner loop correct position
- 1 mark – Inner loop (counter2) from 1 to outer loop counter
- 1 mark – Add inner loop counter to output string
- 1 mark – Display output string outside inner loop, inside outer loop

ALTERNATE SOLUTION

Line	Algorithm_Display_Pattern
1	Input number
2	Loop counter \leftarrow 1 to number
3	Loop counter2 \leftarrow 1 to counter
4	Display counter2 (one character)
5	EndLoop counter2
6	Move to next line
7	EndLoop counter

Accept any other valid algorithm (5)

TOTAL SECTION E: 29

SECTION F: INTEGRATED SCENARIO**QUESTION 6**

- 6.1 6.1.1 An area where wireless/Wi-Fi/ Internet ✓ access is available/connected/shared ✓ (2)
- 6.1.2 Un-encrypted data/files that are sent can be intercepted ✓
- OR**
- Any other acceptable example of personal information being exposed/hacking/threat of malware/viruses (1)
- 6.1.3(a) A peer-to-peer protocol/network ✓ for downloading files from the internet
- OR**
- A file sharing software (1)
- 6.1.3(b) *Any TWO reasons to block BitTorrent* ✓✓
- Security issues
 - To prevent piracy of software
 - Data use/Data cap
 - Congestion/Slow down performance of network (2)
- 6.2 6.2.1 Virtual Private Network ✓ (1)
- 6.2.2 Allows users to log into a network via the internet with the same security of a LAN.
- Concepts:** Any TWO ✓✓
- Log in via Internet
 - Remotely
 - Secured network/connection (2)
- 6.3 6.3.1 (a) Dynamic page ✓
- Any ONE motivation: ✓
- Additional parameters are included that provide information to the software on the server in order to generate a dynamic page.
 - ASP (Active Server Pages) are dynamic in nature. (2)

6.3.1 (b) *Any ONE for a mobi website ✓✓*

- Ends with .mobi

OR

- M prefix

(2)

6.3.2 (a) *Any TWO hints to use less power ✓✓*

- Turn off devices when not in use
- Change screen settings to dim
- Use automatic app that puts apps to sleep
- Close unnecessary apps
- Turn off Wi-Fi when not in use
- Turn off Bluetooth/GPS when not in use

(2)

6.3.2 (b) *Any ONE way to reduce impact on environment ✓*

- Send old equipment to e-cycler/for recycling
- Donate useful equipment to others
- Re-use parts, that is still usable, in other computers

(1)

6.3.3 SEO/Search (engine) optimisation ✓

(1)

6.4 6.4.1 *DDoS:*

Many bot computers are used to bombard the servers hosting the restaurants website with a large number of requests ✓, the servers are over loaded and cannot respond so the website becomes unavailable ✓

Concepts:

- High number of requests/overloaded with requests
- Website becomes unavailable

(2)

6.4.2 *Any TWO measures to prevent cybercrime ✓✓*

- Install and update anti-virus software
- Use a firewall
- Use a strong password
- Make sure software is updated regularly
- Be aware of trends in cybercrime/Training of staff to be vigilant
- Not answering to phishing mail
- Make use of encryption
- Human verification/Captcha

(2)

- 6.5 6.5.1 The app is connected to the Internet. ✓
The front end of the app is installed on the device, and the data is accessible/stored in the cloud/web server. ✓ (2)
- 6.5.2 *Any TWO reasons for the popularity of apps: ✓✓*
- Interface is easier to navigate
 - Has a dedicated purpose
 - Apps knows where to find data/do not have to enter URL's
 - All the interface data already installed on your device/ speeds up responsiveness/use less data
 - Can fetch data in the background
 - Give notifications
 - Can work with syncing device/online storage
 - Can use additional sensors like GPS
- (2)
- 6.5.3(a) GPS ✓ (1)
- 6.5.3(b) *Any TWO benefits of a check-in service: ✓✓*
- Users will know if friends visit restaurant and can join them
 - Profiling of customers
 - Advertising specific deals/Marketing strategy
 - When some-one is near restaurant invite them
 - Easily reached for online orders
 - Invisible data capture
 - Feedback from customers
- (2)
- 6.6 6.6.1 The purpose of a data warehouse is to provide storage for large amounts of data ✓ and tools to access the data ✓ for data mining purposes.
- Concepts:**
- Large amount of data stored
 - Using the data
- (2)
- 6.6.2 *Any TWO roles played by people in data-mining process ✓✓*
- Select/gather/prepare data sets
 - Interpret/reporting
 - Verify data mining results
 - Develop data mining software/algorithms
- Also accept: specific examples (2)

6.6.3 To identify hidden trends that can be used to make management decisions for example purchasing more stock for the months with high customer volumes.

Concepts:

- Identifying trends/patterns ✓
- Using information in a practical way in the restaurant context ✓

Also accept: Valid examples and explanation of the use of the data in the restaurant context

(2)

6.7 6.7.1 *Any TWO advantages for using an online application* ✓✓

- Don't need local powerful resources/processing done elsewhere
- Is not installed on system/saves hard disk space
- Always the latest version available/automatically updated
- Run in the browser
- Can be used on any device
- Can be used from anywhere where there is Internet access
- Automatic online backup of data

Do not accept: Functionality or Cost.

(2)

6.7.2 Do not need internet access ✓ to use the software.

(1)

TOTAL SECTION F: 37
GRAND TOTAL: 150