



# basic education

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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-scanning ✓ |     |
|     |       | 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"> <li>• Physical damage</li> <li>• Power surge</li> </ul> <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><b>Do not accept:</b> 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)
<b>TOTAL SECTION B:</b>			<b>23</b>

**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 (1)

4.2.1(b) Any ONE ✓

- Boolean
- YesNo
- True/False (1)

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

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

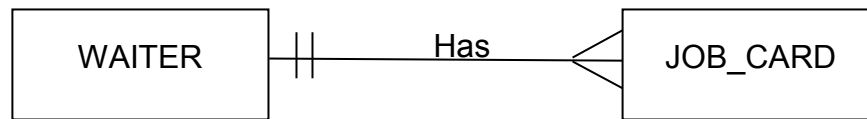
- (b) ✓ TotalHours is NOT included
- (c) ✓ FK correctly identified

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
- | <b>WHILE...DO</b>  | <b>REPEAT...UNTIL</b>                            |   |
|--|--|---|
| 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
- WriteIn-statement does not refer to the text file (example: writeIn(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**