



Province of the
EASTERN CAPE
EDUCATION

**NATIONAL
SENIOR CERTIFICATE**

GRADE 12

SEPTEMBER 2019

**INFORMATION TECHNOLOGY P2
MARKING GUIDELINE**

MARKS: 150

This marking guideline consists of 14 pages.

SECTION A: SHORT QUESTIONS**QUESTION 1**

- | | | | |
|-----|--------|---|-----|
| 1.1 | 1.1.1 | Audit trail ✓ | (1) |
| | 1.1.2 | Destructor ✓ | (1) |
| | 1.1.3 | Smartwatch ✓ | (1) |
| | 1.1.4 | Robotics ✓ | (1) |
| | 1.1.5 | Compiler ✓ | (1) |
| | 1.1.6 | BitTorrent ✓ | (1) |
| | 1.1.7 | Internet of Things ✓ | (1) |
| | 1.1.8 | Transaction Processing System/TPS ✓ | (1) |
| | 1.1.9 | Green Computing ✓ | (1) |
| | 1.1.10 | Webinars ✓ | (1) |
| 1.2 | 1.2.1 | B ✓ a sequence of logical steps that will solve a problem | (1) |
| | 1.2.2 | D ✓ 9 | (1) |
| | 1.2.3 | B ✓ A dynamic link library file | (1) |
| | 1.2.4 | D ✓ Denial-of-service attack | (1) |
| | 1.2.5 | B ✓ Encapsulation | (1) |

TOTAL SECTION A: 15

SECTION B: SYSTEM TECHNOLOGIES**QUESTION 2**

- 2.1 2.1.1 (a) Cache is a small amount of high speed memory ✓ where data and instructions likely to be used next by the CPU is stored, eliminating the need to fetch it from the slower RAM. ✓

Concepts:

- High speed memory
- Saving time in fetching instructions (2)

- (b) Cache is embedded on the processor / It is built on the processor and is not removable. ✓

Concept:

not removable / embedded (1)

- (c) Any TWO ✓✓
- Faster at boot up time / faster access time
 - No moving parts and is less easily damaged/longer life span /lasts longer/more reliable
 - Uses less power
 - Generates less heat
 - Smaller dimensions (2)

- 2.1.2 (a) Any TWO ✓✓
- Provides a user interface
 - I/O management
 - Process management
 - File management
 - Security
 - Manages system memory
 - Optimises efficiency/speed (2)

- (b) (i) Android is designed for mobile devices ✓ such as smartphones and tablets. (1)

- (ii) Linux Ubuntu is designed to be used in a network or server or desktop environment (not by mobile devices). ✓ (1)

- 2.2 2.2.1 Any ONE ✓ (1)
- Manage/Maintain/Control computer resources
 - Adds more functionality for specific management tasks
 - Performs routine maintenance and administration tasks in a computer (1)

2.2.2 Any ONE ✓

- Internet filters
- Spam blockers
- Pop-up blockers
- Anti-spam programs
- Phishing filters
- Any other filtering tool (1)

2.3 2.3.1 Fast and reliable Internet connection ✓ (1)

2.3.2 *Cloud application* – is software where most of the processing of the software is done in the cloud by one or more servers on the Internet. ✓

Local application – is the software/program that is stored and runs on a computing device. ✓ (2)

2.3.3 Any THREE ✓✓✓

- Scalability
- Ubiquity (Anywhere/Anytime)
- Enables collaboration
- Outsources maintenance and upgrades of hardware
- Outsources software and installation and upgrades (3)

- 2.3.4
- *Cloud-based apps* ✓ – software that runs on remote servers on the internet ✓
 - *Downloadable, local installed apps* ✓ – software that you rent is downloaded and runs on your local computer ✓
 - *Integrated products* ✓ – combine cloud-based software and locally installed software ✓ (6)

TOTAL SECTION B: 23

SECTION C: COMMUNICATION AND NETWORK TECHNOLOGIES

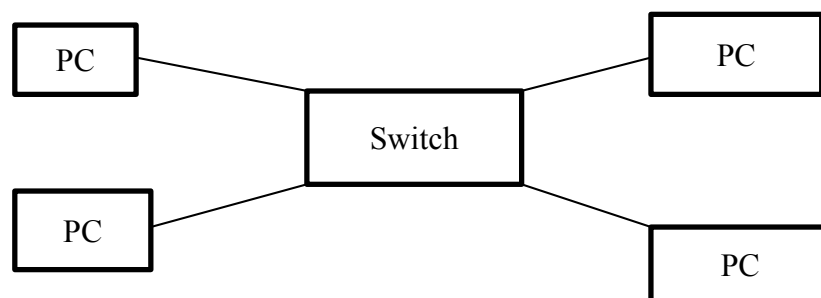
QUESTION 3

3.1 Any TWO ✓✓

- High level of expertise is needed to set it up
- Need a high level of security
- Malware can spread very easily
- If network develops a problem, no one can work
- A central problem with server could lead to loss of connection to network/ non-availability of resources if the server is down/offline
- Cost of hardware

(2)

3.2 3.2.1



- Switch/Central connection point ✓
- Computers/nodes ✓
- Separate connection to the switch ✓

(3)

3.2.2 Any TWO: ✓✓

- Easy to troubleshoot
- Easy to set-up
- Easy to add new devices
- Faster transmission of data to correct computer through a switch
- Can remove any computer that does not work without affecting the network

(2)

3.3 3.3.1 Any ONE ✓

- Cheap to install
- Easy to install
- Flexibility of cables
- High bandwidth over short distances

(1)

3.3.2 Any TWO ✓✓

- Electro Magnetic Interference (EMI)
- Crosstalk
- Eavesdropping

(2)

- 3.3.3 Any ONE ✓
- Amplifier can be used to boost the signal quality
 - Multiple Access Points added to increase the accessibility radius (1)
- 3.4 3.4.1 HTTPS ✓ (1)
- 3.4.2 3.4.1 Any ONE ✓
- Making video/audio/video calls over the Internet/network
 - Provides a two-way multimedia communication over the Internet (1)
- 3.5 3.5.1 Video on Demand ✓ (1)
- 3.5.2 Hotspot ✓ (1)
- 3.5.3 To provide Internet access / to provide internet connection ✓ (1)
- 3.5.4 Wi-Fi / Wireless connectivity ✓ (1)
- 3.6 3.6.1 *Digital certificate* – is an electronic document/ certificate issued by a third party ✓ to verify/authenticate the identity of a person or an organisation ✓ may be trusted for communication of sensitive information. (2)
- 3.6.2 Certificate Authority/CA ✓ (1)
- 3.6.3 Any ONE ✓
- Investigate and verify that the business or organisation is what it claims to be
 - Its website exists at the IP address specified
 - Its public key has not expired (1)
- 3.6.4 Any FOUR ✓✓✓✓
- Owner's public key
 - Owner's name
 - Expiration date of the public key
 - Name of issuer (the Certificate Authority that issued the digital certificate)
 - Serial number of the digital certificate
 - Digital signature of the issuer (4)

TOTAL SECTION C: 25

SECTION D: DATA AND INFORMATION MANAGEMENT

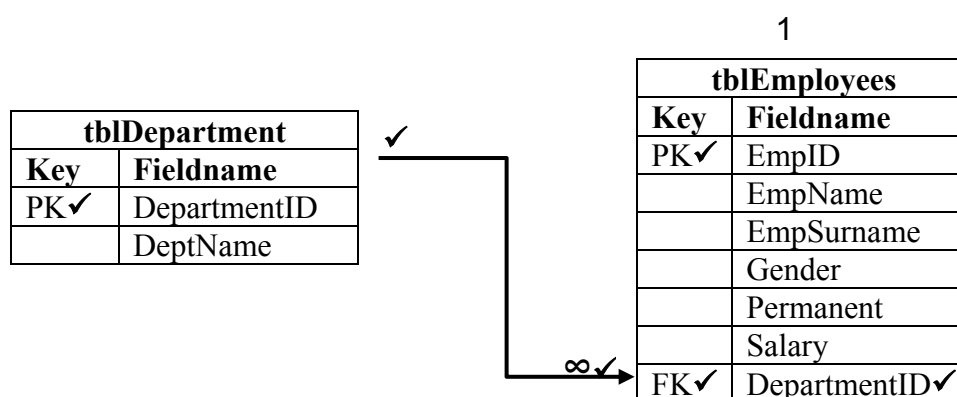
QUESTION 4

4.1 4.1.1 Any ONE ✓

- Yes/No
- Boolean

(1)

4.1.2

**Concepts:**

(a) PK ✓ in tblDepartment and PK ✓ in tblEmployees (2)

(b) FK, ✓ DepartmentID ✓ and tblEmployees ✓ (3)

(c) 1 ✓ and ∞ ✓ (2)

- 4.2 4.2.1
- *Insert anomaly* - the database design prevents a user from capturing data when they want or need to. ✓
 - *Delete anomaly* – deleting one piece of data results in the simultaneous removal of other, unrelated data. ✓
 - *Update anomaly* – when an item of data changes, it has to be altered/changed in multiple records in the table. ✓

(3)

4.3 4.3.1 *Physical integrity* – overcoming practical issues such as power failure, mechanical failure, natural disasters and dealing with the physical storage and retrieval of data. ✓

Logical integrity – correctness of data or data making sense in a particular context. ✓ (2)

4.3.2 UPS ✓ and RAID ✓ (2)

- 4.4 4.4.1 Physical independence ✓ and Logical independence ✓ (2)
- 4.4.2
- The actual data management is left to the DBMS software ✓
 - Multiple applications can interface to the same data because the physical structure of the database is not a factor. ✓
 - The use application cannot change the structure or format of the data ✓ (3)
- 4.5 *Rollback* – happens when the DBMS gets the instruction to reverse a transaction or series of transactions and restores the data back to its previous state. ✓
- Record lock* – happens when a record is open, either for editing or for inserting, the record is flagged as in use and no other user can make changes to that specific record. ✓ (2)

TOTAL SECTION D: 22

SECTION E: SOLUTION DEVELOPMENT

QUESTION 5

5.1 Any TWO ✓✓

- The button at the top should be placed at the bottom
- The edits should be empty
- The order is incorrect – put Name first
- Could use SpinEdits for age instead of an Edit

(2)

Type of error		ERROR	Error Message
(a)	Syntax ✓	No semicolon entered at the end of an instruction	Missing semicolon
(b)	Logical ✓	The stock amount is calculated incorrectly. The formula is: StockAmount = quantity - ItemPrice	No error message
(c)	Runtime ✓	A variable is created as an integer data type to store the number of items. When the program runs, the user enters the word instead of a number in a component	Data-type mismatch

(3)

5.2.2 Debugging is a technique/process of finding/locating ✓ and resolving ✓ defects/problems/errors/bugs.

(2)

5.3 5.3.1 Creates a link between an external/physical/permanent/textfile ✓ and variable textfile/logical file ✓ in the program

(2)

5.3.2 Reset opens ✓ a variable textfile and moves the file pointer/cursor to the start/beginning of the file, ✓ ready to start reading.

(2)

5.4 5.4.1 *Array* – a data structure that contains a group of variables containing values of the same data type ✓
Index – an ordinal value indicating the position of the element in the array ✓

(2)

5.4.2 Subscript ✓

(1)

- 5.5 5.5.1 Space is created in memory ✓ to keep the attributes of a specific object ✓

OR

A constructor is used to create an instance of the object class/a space is reserved in memory which is allocated to the properties of an object class.

(2)

Constructor ✓

(1)

- 5.5.2 *Auxiliary method* – methods (procedures or functions) in the class that can assist with calculations and formatting.✓

OR

Methods which perform specific tasks without modifying the state of the object (i.e. the content of any of the instance fields).

Example: toString ✓

(2)

5.6

Line	iCount	iCount > 5?	iNumber	Output redOut
1	1	No ✓		
2			1 ✓	
3				1 ✓
1	2 ✓	No ✓		
2			4 ✓	
3				4 ✓
1	3 ✓	No ✓		
2			9 ✓	
3				9 ✓
1	4 ✓	No ✓		
2			16 ✓	
3				16 ✓
1	5 ✓	No ✓		
2			25 ✓	
3				25 ✓
1	6 ✓	Yes ✓		

(21÷3) = (7)

TOTAL SECTION D: 26

SECTION F: INTEGRATED SCENARIO**QUESTION 6**

- 6.1 6.1.1 orico.co.za ✓ (1)
- 6.1.2 Classen Jim and Breeze Kelly ✓ (1)
- 6.1.3 Spoofing ✓ (1)
- 6.2 6.2.1 Secure Sockets Layer is an encryption protocol ✓ for managing the transmission of sensitive data over the Internet ✓ (2)
- 6.2.2 Any TWO ✓✓
- DRM (Digital Rights Management)
 - ATM
 - Internet browsers
 - Skype calls
 - Online storage devices
- (2)
- 6.3 Any TWO ✓✓
- Network engineer
 - Network architect
 - Network administrator
 - Network analyst
- (2)
- 6.4 6.4.1 Biometrics refers to the use of personal characteristics ✓ to authenticate the identity of a person. (1)
- 6.4.2 Any ONE suitable example ✓
- Retina/Eye
 - Fingerprint
 - Voice recognition
 - Facial recognition
 - Palm readers
- (1)
- 6.4.3 Any TWO ✓✓
- Cards can be cloned
 - Cards can be stolen/lost
 - Inconvenience of carrying cards around
 - Costs of manufacturing cards
 - Cards do not validate the identity of the user
 - RFID cards can be read from a distance that can trigger the unlocking of the room even when not required
- (2)

6.5 6.5.1 *Computer drone* – is an unmanned aerial vehicle or is an aircraft without a human pilot aboard. ✓ (1)

6.5.2 It is used to gather information especially where the environment may be dangerous for humans. ✓ (1)

6.5.3 Any THREE ✓✓✓

<ul style="list-style-type: none"> • Aerial surveying • Journalism • Law enforcement • Search and rescue • Scientific research • Conservation and surveying 	<ul style="list-style-type: none"> • Military purposes • Mapping /Urban planning • Agriculture • Healthcare • Emergency response • Disaster management 	<ul style="list-style-type: none"> • Telecommunications • Mining • Waste management • Weather forecasting
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(3)

6.6 6.6.1 Distributed database refers to parts of the database ✓ that are spread over multiple servers in different locations. ✓ (2)

6.6.2 Any TWO ✓✓

- Eliminate congestion on a single server
 - Can handle a large number of simultaneous users
 - The branches of a company can be spread over a large geographical area
 - If one server is down, other databases can be used
 - Lower cost of communication as less data is being communicated.
- (2)

6.7 6.7.1 *Wiki* – a web application that allows people to add to and modify the content of an online knowledge resource. ✓ (1)

6.7.2 Any TWO ✓✓

- Free access or low cost access to information
 - Collaboration
 - Publish and share documents
 - Flexible tool which can be used for a wide range of applications
 - Knowledge centre
- (2)

6.7.3 Any TWO ✓✓

- Poor quality
 - Poor standard
 - Information not properly researched and approved
- (2)

- 6.8 *Click farms* refer to businesses that use groups of low paid workers whose work is to repetitively click on links ✓ to fake high web traffic. ✓ (2)
- 6.9 6.9.1 Any TWO ✓✓
- Limit time on the web
 - Turn off notifications when doing important work
 - Remove yourself from FOMO
 - Refrain from insulting other people/bullying
 - Be aware that all posts are public
 - Do not befriend strangers
 - Do not share personal information e.g. ID number, bank account numbers, address etc.
 - Be aware that the Internet never forgets information/cannot delete information from the Internet. (2)
- 6.9.2 Piggybacking ✓ (1)
- 6.10 Telecommuting – working in decentralised locations e.g. from home, ✓ but using modern communication ✓ to check in at a physical office. (2)
- 6.11 Virtual office refers to a fixed physical address, ✓ containing minimal office setup which is used as a shared space ✓ by people who work from a mobile office. (2)
- 6.12
- Fix errors or bugs in our existing programs ✓
 - Close/seal security loopholes that hackers and malware might try to exploit ✓
 - Add new features and improvements to existing software ✓ (3)

TOTAL SECTION F: 39
GRAND TOTAL: 150