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

## **NATIONAL SENIOR CERTIFICATE**

**GRADE 12**

**INFORMATION TECHNOLOGY P2**

**NOVEMBER 2019**

**MARKING GUIDELINES**

**MARKS: 150**

**These marking guidelines consist of 15 pages.**

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

1.1	1.1.1	D ✓		(1)
	1.1.2	B ✓		(1)
	1.1.3	C ✓		(1)
	1.1.4	A or D ✓		(1)
	1.1.5	C ✓		(1)
1.2	1.2.1	J ✓	CSS	(1)
	1.2.2	F ✓	Driver	(1)
	1.2.3	D ✓	Topology	(1)
	1.2.4	N ✓	Firewall	(1)
	1.2.5	K ✓	Incremental backup	(1)
	1.2.6	A ✓	Client	(1)
	1.2.7	R ✓	DBA	(1)
	1.2.8	I ✓	Computer worm	(1)
	1.2.9	B ✓	Attenuation	(1)
	1.2.10	C ✓	AUP	(1)

**TOTAL SECTION A: 15**

**SECTION B: SYSTEM TECHNOLOGIES****QUESTION 2**

2.1.1 8/ 2 x 4 GB ✓ (1)

2.1.2 HDD ✓ (2)  
RPM/ spinning disk/ moving parts/ rotation speed. ✓

2.1.3 1500 - 1536 GB / gigabytes ✓ (1)

2.2.1 Fetch ✓instructions and data from memory (RAM).  
Decode ✓the instructions. (2)

2.2.2 Programs are split into smaller tasks called threads. ✓  
Threads can be run simultaneously as if they are separate independent (2)  
programs. ✓

2.3.1 Any TWO: ✓✓ (2)  

- Speed of processing cores/ processing power/ clock speed.
- Number of processing cores/ pipelining.
- Amount of memory/ dedicated memory.
- Type of RAM
- GPU Cache
- The speed of its communication with the motherboard/  
Whether it is installed into a PCI-Express x 8 or PCI Express x 16 slot.

2.3.2 The built-in graphics adapter is used when performing tasks that don't require  
intense graphics processing✓ to conserve battery power. ✓  
When programs are executed that require more intense graphics processing, the  
laptop switches over to use the graphics card.

**ANY TWO Concepts**

- Improved graphics processing
- Conserve battery power
- Decrease the load of the CPU
- Cannot Add/Upgrade the graphics card in the laptop (2)

2.4.1 Power On Self Test ✓ (1)

2.4.2 POST checks/tests that all important hardware (RAM, HDD, etc.) is working✓ (1)

2.5.1 Separate technologies and functions are combined into a single multi-purpose  
device. ✓ (1)

2.5.2 They can emulate/ test different smartphones/OS/platforms on a computer. ✓ (1)

2.6 *Any TWO: ✓✓*

- Close unnecessary programs to free up memory.
- Add more RAM to your computer.
- Ensure that you run a 64-bit operating system. Otherwise you can't use more than 4 GB.
- Replace with a faster storage (SSD). (2)
- The use of the cloud/server for storage/processing

2.7.1 To connect/house the CPU. ✓ (1)

2.7.2 Hardware can be added or removed while the computer is on. ✓ (1)

2.8.1 *Any TWO: ✓✓*

- Limited features / full version subject to time-limit.
- License must be bought to use full version.
- Available as a trial version/ try before buy (2)

2.8.2 (a) A regular (usually monthly) subscription fee is paid to use the software/ rented software. ✓ (1)

(b) *Any ONE: ✓*

- User always gets the latest version of the software.
- Only pay for what you use/ scalability of software
- Processed in another place like cloud/ server/ another location
- Saves storage space/ no need to install on hard drive
- No need for backups
- Accessibility on different devices/ locations (1)

2.9 The scattering/ spreading of parts of a file ✓ to several sectors on the disk which slows down the disk's data access speed. (1)

**TOTAL SECTION B: 25**

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

- 3.1      3.1.1      UTP / STP/ Ethernet cable/ Fibre ✓ (1)
- 3.1.2      The router directs/redirects/sends data over a network✓ and chooses the best route to the destination ✓
- Concepts
- Transferring data between networks/ Internet
  - Finding the correct destination/redirecting (2)
- 3.2      3.2.1      *Any TWO: ✓✓*
- Easy to set up a wireless network
  - It is easy to add new / more devices.
  - Lower setup cost.
  - Increased mobility/ Provides flexible layout to users of wireless/mobile devices.
  - Provides a connection where cabling is not possible.
- Any answer related to no cables needed (2)
- 3.2.2      It is a sender and receiver with an antenna ✓to send and/or receive radio waves. ✓
- Any TWO concepts*
- Connection to the Internet/network/wifi
  - Send and receive signals
  - Uses radio waves (2)
- 3.3      3.3.1      Gaining access to and using someone else's Internet connection unlawfully/ without permission. ✓ (1)
- 3.3.2      *Any TWO: ✓✓*
- Don't keep the default password – replace it with a good original password.
  - Change the password on a regular basis/ good password policy
  - Don't leave your Wi-Fi connection open – secure it with a password/ use a password
  - Limit the amount of data/devices/list of users
  - Make the hotspot invisible
  - Verification of the Mac address
  - Limit the range
  - Switch off when not in use (2)

- 3.4      3.4.1      The website uses the saved preferences of a user to generate the site/ It will differ for every user/ This personalizes the user experience of your business. ✓  
Interactivity ✓  
Easy updates ✓
- Any 3 concepts
- Personalisation/ Differs for all users
  - Generated on the server
  - Based on parameters
  - Interactivity
  - Easy to manage content
- (3)
- 3.4.2      Make use of search engine optimisation(SEO) (1)
- 3.4.3(a)    A set of rules ✓ for encoding and decoding of data for transfer ✓ (2)
- 3.4.3(b)    It is a secure ✓ protocol for transactions (1)
- 3.5      3.5.1      PAN: has a range of a few metres/ limited/ small range ✓ (1)
- 3.5.2      VPN: virtual private network – uses the Internet / public network ✓ ,  
Sign in with same privacy/ same security as a LAN ✓ (2)
- 3.6      3.6.1      Web application ✓ with functions and properties of traditional applications / software. ✓ (2)
- 3.6.2      Any ONE: ✓
- Google Docs
  - Microsoft Office Live
  - Office 365
  - Microsoft Office 365
- (1)
- 3.7      Any TWO: ✓✓
- Ease of use/ convenience
  - Accessibility
  - Marketing of business by app stores
  - Notifications
  - Using extra sensors/ functions/ properties in mobile device
- (2)
- 3.8      3.8.1      Processing, where the physical location ✓ of objects /devices / persons is used. (1)
- 3.8.2      GPS ✓ (1)

- 3.9      3.9.1      A podcast is an audio file/recording ✓ available on the internet/network for download✓ (2)
- 3.9.2      *Any ONE:* ✓
- Real-time delivery of media content to a receiving device.
  - Playing a file from an online source where the file is not permanently saved on the receiving device. (1)

**TOTAL SECTION C:      30**



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

- 4.1 Value must be unique/ no duplicates. ✓ (1)
- 4.2 Range check/ Validation rule ✓ (1)
- 4.3 4.3.1 ClientSAID and ClientSAID\_Ref ✓ (1)
- 4.3.2 One-to-Many relationship ✓  
On the One side: tblClients table  
On the Many side: tblOrders table ✓
- Concepts
- Correct type of relationship
  - Correct table indicated for one and for many side (2)
- 4.4 Adding the ClientAge field will result in data redundancy as the age can be derived from the ID field. ✓ (1)
- 4.5 Desktop DBMS ✓  
Desktop DBMS will be sufficient as the business is small and operates from a single building. ✓
- OR
- Server DBMS  
Server DBMS will be more scalable/better accessibility.
- Learner suggest desktop/server DBMS with suitable motivation for two marks (2)
- 4.6 4.6.1 Run-time error ✓ (1)
- 4.6.2 Referential integrity/ relational tables ✓ (1)
- 4.7 Keeping identical copies ✓ of a database (1)
- 4.8 Any TWO: ✓✓
- Use different passwords for different accounts.
  - Make passwords long in length.
  - Avoid using words that can be found in a dictionary.
  - Avoid using personal information about yourself or your family.
  - Change passwords on a regular basis.
  - Include a combination of special characters, uppercase and lowercase characters and numbers.
  - Avoid keyboard patterns (2)

- 4.9 The capturing of private/ unrelated information✓ without the users' knowledge. ✓ (2)
- 4.10 The practice of examining large datasets in existing databases (and data warehouses) in order to generate new information/finding patterns/trends ✓in data. (1)
- 4.11 Keeps track of / records ✓ changes ✓ in the database
- OR
- Who made the changes.  
When the changes were made. (2)
- 4.12 When a record is open for editing / inserting, the record is flagged as 'in use'✓  
No other entity can make changes to that specific record until 'in use' flag/lock is removed. ✓ (2)

**TOTAL SECTION D: 20**

**SECTION E: SOLUTION DEVELOPMENT****QUESTION 5**

5.1

5.1.1 String/ Text ✓ (1)

5.1.2 Integer/ Number ✓ (1)

5.2

5.2.1 *Any ONE:* ✓  
NOT((10 > 5.0) OR (False))  
NOT(True OR False)The final answer  
False ✓ (2)5.2.2 *Any ONE:* ✓  
(False = NOT True) AND (5.0 = 10 / 2)  
True AND TrueThe final answer  
True ✓ (2)

5.3

5.3.1 2 ✓ (1)

5.3.2 5 times ✓ (1)

5.3.3 4 ✓✓ (the contents of the loop has not been executed) (2)

5.4

Minimum: 5 ✓  
Maximum: 12 ✓ (2)

5.5

Ceil() ✓ (1)

5.6

*Any ONE:* ✓

- Every single element needs to be compared / checked.
  - In large datasets this can take a long time to perform.
- (1)

5.7

```
1 Display 'Please enter a string of digits'
2 sInput ← input
3 Loop i from 1 to length(sInput) ✓
4     sLine ← '' ✓
5     n ← sInput[i] ✓
6     Loop j from 1 to n ✓
7         sLine ← sLine + '*' ✓
8     Display sLine ✓
```

**Concepts****Correct outer loop (1)**

Initialize output variable before inner loop (1)

Inner loop (1) from 1 to character at outer loop position (1)

Add '\*' to output variable (1) in inner loop

Display output variable (1)

(6)  
**TOTAL SECTION E: 20**

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

- 6.1      6.1.1      A *mobile office* refers to a situation where you can carry/have with your portable tools essential for your business and the communication equipment ✓ that makes you reachable✓.
- Concepts
- A description of mobility
  - Office equipment
- (2)
- 6.1.2      Any *ONE*: ✓
- Can work from anywhere
  - A freelance worker avoids the expense of paying rent
  - Resources and equipment are always on hand
  - Working hours not dependant on access to office
- (1)
- 6.2
- 6.2.1      Cloud / Internet / Cyberspace/ Web✓
- (1)
- 6.2.2      Any *TWO* correct examples of cloud storage services: ✓✓
- Google Drive
  - DropBox
  - OneDrive
  - MediaFire
  - MEGA
  - iCloud
  - NextCloud
  - SkyDrive
- (2)
- 6.2.3      Any *TWO*: ✓✓
- Image files
  - Video files
  - Sound files
  - Text
  - Media file
- (2)
- 6.2.4      Any *ONE*: ✓
- Media platform for professionals with the same interest
  - Create a work/ experience profile/ job search
  - Marketing platform for professionals
- (1)

6.2.5 *Any TWO: ✓✓*

- Do not provide personal/their details such as cell phone numbers or ID/ Do not provide passwords/Social engineering
- Enable privacy settings
- Disable share location settings/whereabouts
- Block unwanted users
- Disable cookies
- Limit third party applications
- Do not befriend strangers

(2)

6.3 The process of getting two or more sets of data across multiple devices/ locations ✓ updated with the latest/same versions ✓ of the data. (2)

6.4

6.4.1 *Any TWO: ✓✓*

- Easy to upgrade outdated hardware.
- Easy to repair/replace broken/defective hardware.
- Allows for customisation

(2)

6.4.2 *Any ONE: ✓*

- Webcam/ camera/ smartphone
- Speakers/ ear phone/ head phone
- Microphone
- Wireless headset

(1)

6.5

6.5.1 Distributed computing is a system whereby the resources of different computers are shared/combined✓ and used at the same time to solve a single problem✓.

## Concepts

- More than one computer
- Perform a specific/one task

(2)

6.5.2 By downloading and installing software on their computers✓, which will automatically start working on the project when their computers are idle✓.

*Any TWO concepts✓✓*

- Give permission for the use of your computer
- Provide/ share processing power
- Computer is idle/ not in use
- Install the appropriate software on their computers

(2)

6.6

6.6.1 Artificial Intelligence✓

(1)

6.6.2 Since the developer makes use of a knowledge base ✓ there are a fixed number/possible outcomes/answers ✓ for each question or criterion.

(2)

## 6.7

- 6.7.1(a) *Any TWO: ✓✓*
- Anti-malware products/ Antivirus
  - Operating system/ System software
  - Firewall
  - Firmware/ BIOS
  - Web browser
  - Product specific updates (2)
- 6.7.1(b) Anti-malware/ Antivirus products: to allow for newer forms of malware to be detected ✓  
All other software: malware exploits bugs or weaknesses in the security of software. ✓ (2)
- 6.7.2 Malware that locks or encrypts data/devices ✓ until a ransom is paid✓.
- Concepts
- Malware makes data/devices unavailable / unreadable.
  - Ransom/Money must be paid to make data accessible again or decrypt data. (2)
- 6.8
- 6.8.1 An attack that makes a web site unavailable ✓by using thousands of computers/botnet to request data from the site at the same time/overloading the system. ✓ (2)
- 6.8.2 Script kiddie ✓ (1)
- 6.9
- 6.9.1 *Any ONE: ✓*  
Device that uses a battery to supply power.  
Device used in the event of a power failure/problem to supply power. (1)
- 6.9.2 *Any ONE: ✓*
- Helps to protect the computer/storage devices against power surges and spikes.
  - Keeps the computer on to allow the user to save data/ shut down the computer. (1)
- 6.9.3 Lossy ✓ (1)

- 6.10
- 6.10.1 Digital rights management ✓ (1)
- 6.10.2 *Any ONE:* ✓
- BitTorrent/ Torrent/ UTorrent
  - FTP (1)
- 6.11
- 6.11.1 *Any TWO:* ✓✓
- Turn off radio wave transferring and receiving devices such as Bluetooth, GPS, Wi-Fi, etc.
  - Turn on battery-saving mode.
  - Disable sync functionalities.
  - Limit background activity.
  - Close open apps not in use (multitasking).
  - Turn down screen brightness.
  - Avoid playing media or video games on smartphones, as it drains battery rapidly.
  - Carry a battery pack. (2)
- 6.11.2 *Any ONE:* ✓
- An Internet connection is required.
  - Both users need to utilise the same software in order to communicate using VoIP.
  - Credits need to be purchased in order to call telephones that are not on the Internet.
  - VoIP can transfer a lot of data, especially for video calls, which can make it expensive or use up data caps quickly.
  - Call quality is easily negatively affected due to slow or poor quality Internet connections. (1)

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