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NOVEMBER 2019
Information Technology Paper 2

Marks : 150   # Grade 11   Time: 3 hours

</div>

INSTRUCTIONS AND INFORMATION

1. This question paper consists of SIX questions.

2. Answer ALL the questions.

3. Read ALL the questions carefully.

4. Start EACH question on a NEW page.

5. Leave a line after each answer.

6. The mark allocation generally gives an indication of the number of facts required in your answer.

7. Number the answers correctly according to the numbering system used in this question paper.

8. Write neatly and legibly.

SECTION A

QUESTION 1

1.1 Various options are given as possible answers to the following questions. Choose the answer and write only the letter (A–D) next to the question number (1.1.1–1.1.10) on your ANSWERSHEET. E.g.

1.1.11 A ⊠C D

1.1.1 Which ONE of the following represents access speed in descending order?

    A   Cache, RAM, hard disk, magnetic tape
    B   RAM, cache, magnetic tape, hard disk
    C   Magnetic tape, hard disk, RAM, cache
    D   RAM, cache, hard disk, magnetic tape

(1)

1.1.2 The ... process checks if devices are present and working during the booting process.

    A   POST
    B   CMOS
    C   BIOS
    D   SATA

(1)

1.1.3 Working away from the company's standard workplace and using the Internet to communicate with the office is known as ...

    A   Piggy backing
    B   Cloud computing.
    C   Telecommuting
    D   Outsourcing.

(1)

1.1.4 Which ONE of the following would have the furthest reach?

    A   WiMAX
    B   Bluetooth
    C   WiFi
    D   NFC

(1)

1.1.5 Which ONE of the following would describe a small network, such as connecting your phone to your laptop?

    A   LAN
    B   GAN
    C   HAN
    D   PAN

(1)

1.1.6 Which ONE of the following protocols are used for e-mail?

    A   SMTP
    B   FTP
    C   EMAP
    D   MAILP   (1)

1.1.7 … is the total amount of data that can be transferred from one point to another in a specific amount of time.

    A   Broadband
    B   Bandwidth
    C   Kbps
    D   Range   (1)

1.1.8 Which ONE of the following refers to a data structure that is non-volatile?

    A   String
    B   One-dimensional array
    C   Two-dimensional array
    D   Text file   (1)

1.1.9 Which ONE of the following does NOT refer to an example of Android?

    A   Marshmallow
    B   Jelly Bean
    C   Oreo
    D   Crunchie   (1)

1.1.10 Determine the value of **sAnswer** after the execution of the statements below.

sLine := 'Information Technology is great';
sAnswer := copy(sLine, pos('n',sLine)-1, 4);
Insert('T', sAnswer , 2);

    A   Info T
    B   ITnfo
    C   nfoT
    D   nTfo   (1)

(10)

1.2 Give ONE word/term for each of the following descriptions. Write **only** the word/term next to the question number (1.2.1–1.2.5) on the ANSWERSHEET.

1.2.1 Memory used to store the BIOS. (1)

1.2.2 A data structure that can store many values of the same data type under one variable name (1)

1.2.3 Is used to uniquely identify records in a database. (1)

1.2.4 A type of memory that enables a computer to compensate for physical memory shortages by temporarily transferring data from random access memory (RAM) to disk storage. (1)

1.2.5 The concept that more and more devices and objects are being connected to the Internet, with the ability to communicate with each other and make 'intelligent' decisions. (1)

(5)

Total for Question 1 [15]

SECTION B

Scenario
You have recently started working at a local shop that sells sweets. The store is called "*Just Add Sugar*", and the owner is called Mr. Ngidi. Help him to decide which computers and software he needs for his shop by answering the following questions:

QUESTION 2

2.1 Modern computers are designed to be modular.

2.1.1 Explain the concept of *modular design*. (1)

2.1.2 Name TWO advantages of *modular design.* (2)

2.2 In each of the following cases, indicate the type of port/connector which will be used to connect the device or component listed:

2.2.1 Internal hard drive (1)

2.2.2 UTP cable (1)

2.2.3 CPU (1)

2.2.4 Video card (1)

2.3   Mr Ngidi doesn't understand how fast and slow devices can work together in a computer.

Explain to him how this is possible by referring to the system clock.   (1)

2.4   Explain to Mr Ngidi what an IRQ is and what it is used for.   (2)

2.5   Caching is used in multiple places on computers.

Name and explain TWO types of caching.   (4)

2.6   Explain the difference between multithreading and multitasking.   (2)

2.7   Mr Ngidi's biggest fear is a malware infection.

2.7.1   Name TWO ways in which he can prevent malware infections while on the Internet, even though he has anti-malware software installed?   (2)

2.7.2   Explain what a rootkit is.   (2)

2.8   Briefly describe the difference between phishing and spoofing.   (4)

2.9   He has heard some of his IT friends say: "Firmware on some of the computer components may need to be upgraded".

2.9.1   Is firmware considered RAM or ROM?   (2)

2.9.2   Define the term **firmware**.   (2)

2.9.3   List THREE reasons for upgrading firmware on a device   (3)

2.9.4   What does 'flashing the ROM' mean?   (1)

Total for Question 2:   **[32]**

QUESTION 3
COMMUNICATION AND NETWORK TECHNOLOGIES

3.1 Mr Ngidi would like to install a network in the shop in order to centralise data.

    3.1.1 Name TWO advantages of having centralised storage in the shop. (2)

    3.1.2 Name TWO other advantages of having a network installed in the shop. (2)

    3.1.3 The computers will be connected in a Client-Server network. Explain what this means. (3)

3.2 Mr Ngidi has been told that he should install a star topology network.

    3.2.1 Explain the term topology. (2)

    3.2.2 What hardware device would be vital for a star topology? (2)

3.3 Mr Ngidi will be using VoIP for communication to save money.

    Name TWO disadvantages of using VoIP. (2)

3.4 Give TWO reasons for using a VPN. (2)

3.5 Give THREE reasons for companies developing an app instead of allowing users to access their services via a website. (3)

3.6 Give THREE ways to reduce power consumption on mobile devices, without using the device less. (3)

3.7 Mr Ngidi would like to give out advice on making candy and is considering various ways such as blogging and podcasts.

    3.7.1 Explain what a blog and podcast is. (4)

    3.7.2 Give ONE platform that should be better for a step-by-step instruction series on making candy, and explain why. (2)

Total for Question 3: [27]

QUESTION 4 : DATA AND INFORMATION MANAGEMENT

The store orders stock from many suppliers and wishes to develop a database to store the information relating to this.

4.1 Below is an example of a delivery note received from a specific supplier. Study the details and answer the questions that follow

<table>
<tr><td colspan="5" align="center">**DELIVERY NOTE**</td></tr>
<tr><td>DELIVERY DATE</td><td>15 /09 /2019</td><td>TELEPHONE</td><td colspan="2">031 473 6651</td></tr>
<tr><td>SUPPLIER</td><td>AB Wholesalers</td><td></td><td colspan="2"></td></tr>
<tr><td>SUPPLIER ADDRESS</td><td>51 AB Xuma Str Durban</td><td colspan="3">☐ Cash On Delivery (COD)</td></tr>
<tr><td colspan="4" align="center">**ORDER DETAILS**</td><td></td></tr>
<tr><td>NO</td><td>ITEM</td><td>QTY</td><td>UNIT PRICE</td><td>COST</td></tr>
<tr><td>1</td><td>Beacon Slabs</td><td>15</td><td>8.50</td><td>127.50</td></tr>
<tr><td>2</td><td>Simba Chips</td><td>100</td><td>4.50</td><td>450.00</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td>**TOTAL**</td><td>**577.50**</td></tr>
</table>

A table in the database has been proposed as **tblSuppliers**

<table>
<tr><td colspan="3" align="center">**TBLSUPPLIERS**</td></tr>
<tr><td></td><td>**Field Name**</td><td>**Data Type**</td></tr>
<tr><td>PK</td><td>SupplierID</td><td>Text</td></tr>
<tr><td></td><td>SupplierAddress</td><td>4.3.1(a)</td></tr>
<tr><td></td><td>COD</td><td>4.3.1(b)</td></tr>
<tr><td></td><td>Telephone</td><td>Number</td></tr>
</table>

4.1.1 Use the information above and suggest suitable data types for the following fields

(a) SupplierAddress (1)

(b) COD (1)

4.1.2 Give a reason why the data type selected for the *Telephone* field is inappropriate (2)

4.1.3 What is the purpose of a primary key (PK) in a database table? (2)

4.2   In addition to **tblSuppliers** another table, **tblOrders,** has been proposed to keep record of all delivery orders made. An incomplete structure of this table is shown below :

tblOrders	
PK	*4.4.1*
	StockItem
	Quantity
	UnitPrice
	4.4.2

Using details, where necessary, from the delivery note shown in 4.3 above complete the structure of the above table

4.2.1   Suggest a primary key (PK) field for this table   (2)

4.2.2   Give one other appropriate field to be included   (2)
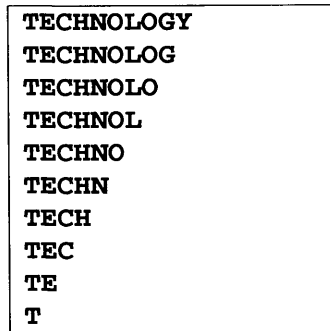
<div align="right">

TOTAL QUESTION 4   [10]

</div>

QUESTION 5
SOLUTION DEVELOPMENT

5.1   Examine the scenarios below and classify each one as either syntax, logical or run-time:

5.1.1   An infinite loop is generated.   (1)

5.1.2   A semicolon (;) is placed at the end of the statement just before the else statement.   (1)

5.1.3   The marks in an array is sorted but the display is an unsorted array.   (1)

5.1.4   The file name is entered correctly but the file is not accessed.   (1)

5.2   Indicate how many times each of the following loops will be executed:

5.2.1   k ← 1
        repeat
        … instructions to be executed
        until k = 1   (2)

5.2.2 k← 0
      while k >= 0
       begin
        ...instructions to be executed
         increment k
       end   (2)

5.3   Study the following sample output:

```
TECHNOLOGY
TECHNOLOG
TECHNOLO
TECHNOL
TECHNO
TECHN
TECH
TEC
TE
T
```

5.3.1 Define the term Algorithm.   (2)

5.3.2 Write pseudo-code as a solution to produce the output for **ANY** word input.
      (*as per sample above*)   (10)

5.4   Consider the following Instruction:

Determine whether a number generated randomly is a perfect number, or not.

Note: A perfect number is when the number is equal to the sum of the factors of the number, **excluding** the number itself.

Example: The number **6** was randomly generated.
The sum of the factors of 6, **excluding 6**, is: 1 + 2 + 3 = 6
The number 6 is therefore a perfect number.

The following pseudo-code was given to solve the problem:

Row Instruction
1. Generate a random number (number) in the range 1 to 100
2. sum ← 0
3. Loop index from 1 to number – 1
4. If number modulus index = 0
5. sum ← sum + index
6. If number = sum
7.   Display message 'Perfect number'
Else
8.   Display message 'Not a perfect number'

Use the following headings in your answer book and complete the trace table with the **number 4** as the randomly generated number.

Show EACH step of your trace.

Number	Sum	Loop Index	Number Mod Index = 0?	Number = Sum?	Output
4					

(7)

Total for Question 5:   **[27]**

QUESTION 6

6.1   *Excerpt from the New York Times ,16 Oct 2019*

Abuse of Location Based Data

"In the right hands location data can be a force for good…it could provide app developers with advertising revenue, it could help parents know that their children are on their way home and it has immense potential for the future: in autonomous driving, augmented reality, and context aware artificial intelligence.

by Jeff Glueck : Chief Executive - Foursquare

6.1.1	Briefly define the concepts of artificial intelligence, autonomous driving.	(3)
6.1.2	What is *Network Administrator*?	(2)
6.1.3	What technology does a location based service rely on?	(2)
6.1.4	It can be said that "in the **wrong** hands location data can be a force for **abuse**". Give an example of how this abuse may occur with a connected app.	(2)
6.2	Name THREE limitations that prevent ICT from reaching more people.	(3)

6.3   ICT has allowed the creation of the Global Village, where people can trade and compete for resources.

6.3.1	What is the Global Village?	(2)
6.3.2	Give one **advantage** and one **disadvantage** of buying a cell phone from an online supplier in another country.	(2)

6.4   Mr Ngidi has decided to **outsource** his complaints division to India.

6.4.1	What does this mean?	(2)
6.4.2	Why would Mr Ngidi consider this?	(2)
6.4.3	Which one of the following processes would robotics be better suited to, manufacturing of sweets or handling customer complaints. Motivate your answer.	(2)
6.4.4	Give one disadvantage of using robotics in the workplace	(2)

6.5   Mr Ngidi has been advised to put an AUP in place for the employees.

6.5.1	Expand the acronym AUP is and explain what it is.	(3)
6.5.2	Name TWO possible items that can be included in an AUP.	(2)

6.6 State whether each of the following statements are true or false and motivate your answer in each case.

    6.6.1 *"Firewalls are used to block viruses"* (2)

    6.6.2 *"Open source operating systems, like Linux cannot be infected by malware"* (2)

6.7 One of the employees wants to share a video with a friend. One of his colleagues suggests that he compresses the file for better quality

    6.7.1 Mention the main disadvantage of media compression (2)

    6.7.2 It is suggested that you compress the file using JPEG format. Indicate why this is not possible and provide an appropriate compression format (2)

    6.7.3 You also need to compress documents. Which type of compression would you use between **lossy compression** and **lossless compression**. Give an example of an application that can be used for this task (2)

Total for Question 6: **[39]**

GRAND TOTAL: **150**

Information Technology

November 2019
Theory

Grade 11

Marks: 150
Time: 3hours

MEMORANDUM

SECTION A

QUESTION 1.1

1.1.1	1.1.2	1.1.3	1.1.4	1.1.5	1.1.6	1.1.7	1.1.8	1.1.9	1.1.10
A✓	A✓	C✓	A✓	D✓	A✓	B✓	D✓	D✓	B✓

1 x 10 = (10)

QUESTION 1.2

1.2.1	CMOS✓
1.2.2	Array✓
1.2.3	Relational Database✓
1.2.4	Virtual Memory✓
1.2.5	The Internet of Things ✓

1 x 5 = (5)

TOTAL QUESTION 1 [15]

SECTION B

QUESTION 2

2.1.1	Computer is made up of multiple different parts✓.	1	
2.1.2	Any TWO of the following✓✓: - Easy to repair or replace parts - Easy to upgrade, etc.	2	3
2.2.1	SATA/IDE✓	1	
2.2.2	RJ-45✓	1	
2.2.3	ZIF✓	1	
2.2.4	PCI/AGP✓	1	5
2.3	All activities are timed to the systems clock✓.		1
2.4	Interrupt request, allows a device to stop the CPU while it's working to perform a specific task✓✓.		2
2.5	Any TWO of the following✓✓✓: - Web caching - Disk/Storage caching - Communications caching - CPU		4
2.6	Multitasking – Appears to run multiple programs at the same time✓ Multithreading – OS allows programs to split themselves into multiple parts✓		2

2.7.1	Any TWO of the following✔✔: - Do not visit suspicious sites - Do not download pirated content, etc.	2	
2.7.2	Collection of programs that infiltrate a computer✔ and gain admin privileges✔.	2	4
2.8	Phishing – fooling a user✔ into giving out personal/confidential information✔ Spoofing – changing the header of an e-mail✔ so it appears to have come from a different source✔		4
2.9.1	ROM ✔	1	
2.9.2	Firmware is software that is permanently installed on ROM chips used to control the basic operation of a device. ✔	1	
2.9.3	Newer features ✔, Security updates ✔ Bug Fixes ✔	3	6
2.9.4	Wiping all existing contents and replacing with an updated version ✔	1	
			[30]

QUESTION 3

3.1.1	Any TWO of the following✔✔: - Can access data from any computer - Easy backups - Data changes happen in one place, but are shown everywhere, etc.	2	
3.1.2	Any TWO of the following✔✔: - Share devices - Share Internet connection - Easy transfer of files - Update/Install software from a central place, etc.	2	
3.1.3	Computers are divided into two computers – Clients and servers. ✔ Servers provide resources✔ Clients use resources✔	3	7
3.2.1	Physical layout/connections of a network✔.	1	
3.2.2	Switch✔	1	2
3.3	Any TWO of the following✔✔: - Bad quality if the Internet connection is bad - You need the same software - Purchase credits to phone other numbers - Data use, etc.		2
3.4	- Encryption on connection✔ - Getting around geographical locks✔		2
3.5	Any THREE of the following✔✔✔: - Less data transfer - Notifications/Push messages - Layout can be better/More specific functions/Better interface - Gives users more control		3
3.6	Any THREE of the following✔✔✔: - Brightness level of the screen - Switch off GPS - Switch off connectivity not being used, e.g. wifi, Bluetooth		3

	- Do not run multiple tasks at the same time, etc.			
3.7.1	Blogging – websites that are updated in chronological/sequential form✓✓. Podcast – pre-recorded audio that can be downloaded and listened to✓✓.	4		
3.7.2	Youtube/Video platform✓ – You can show/see actual process✓.	2	6	
			[25]	

QUESTION 4

4.1.1	Any THREE of : ✓✓✓ • Accuracy • Correctness • Currency • Completeness • Relevance	3		
4.1.2	Any TWO (explanation NOT necessary !) ✓✓ • Format Check – specific data format must be entered • Range Check – check to see that the data falls within a certain range • Data type check – check to see that the right type of data is Entered • Presence check – compulsory fields, or mandatory fields • Check digit – unique digits to identify personnel, or clients	2		
			5	
4.2.1	Software that allows you to work with electronic databases ✓	1		
4.2.2	It will contain features that will enable you to : • create a database • edit a database structure • Add , edit and delete data in the database • Query or search a database • Process the data in the database to extract information (Any TWO) ✓✓	2		
4.2.3	Server database is stored on one server✓ whilst distributed database is located on different servers in different geographical locations ✓	2		
4.2.4	When the number of connected users become too large for one server✓ and the business is spread over a large geographical area. ✓	2	7	
4.3.1 a)	Text / String ✓	1		
4.3.1 b)	Yes/No / Boolean ✓	1		
4.3.2	Any ONE of : ✓✓ • The leading zero would be lost / not displayed • Too large a numerical value to be stored as an integer • No calculations will be done with this value • It would be easier to isolate the digits	2		
4.3.3	It enables you to uniquely identify records in a database /table	1	5	
4.4.1	OrderID / OrderNum (or any such relevant field) ✓	1		
4.4.2	Cost **OR** DeliveryDate **OR** ItemType (Any ONE) ✓	1		
4.4.3	SupplierID ✓	1		

4.4.4			
	SUPPLIER ─┤├──────────<─ ORDER **Correct entities drawn in diagram** ✔ **Correct relationship (1 – Many)** ✔ **All details correct in diagram** ✔	3	
4.5	A problem that occurs when deleting one piece of data, results in the simultaneous removal of other unrelated data. ✔ It occurs when the database tables are not structured properly / not normalised ✔	2	
		TOTAL QUESTION 4	**[25]**

QUESTION 5

5.1.1	run-time / logical ✔	1	
5.1.2	Syntax ✔	1	
5.1.3	Logical ✔	1	
5.1.4	Logical ✔	1	4
5.2.1	1 Time ✔✔	2	
5.2.2	Infinite number of times ✔✔	2	4
5.3.1	An algorithm is a point form solution to a problem which contains a set of Steps ✔ Algorithms are Universal because any programmer of any programming language can code the solution using the algorithm. ✔	2	

5.3.2	{any suitable correct solution}
	
	Input sword
	Loop from 1 to length of sword ✔
	    Display sword ✔ ⎤ inside
	    Delete from sword letter at position length of sword ✔✔✔ ⎦ loop
	Or
	Input sword
	Loop from length of word down to 1
	    NewWord ← copy from sWord starting at position 1 to the value of
	                the loop controller
	    Display NewWord
	End loop
		5	7

5.4	Number	Sum	Loop Index	Number Mod Index = 0?	Number = Sum?	Output		
	4	**0**	**1**	**T**		✔		
		1	**2**	**T**		✔		
		3	**3**	**F**		✔		
					F			
					✔	**NOT A PERFECT NUMBER** ✔	5	5

	TOTAL MARKS QUESTION 5 :		**[20]**

QUESTION 6

6.1.1	AI – is the ability of a computer system/program to simulate human decision making processes based on inputs from various sensors ✔ Autonomous driving – the process of a vehicle being able to drive itself with little or no human involvement; ✔ Augmented reality – an interactive experience of the real world where objects are enhanced by computer generated images/information superimposed, using many sensors. ✔	3	
6.1.2	Foursquare is a social networking website and application✔ that provides services based on the users location✔	2	
`6.1.3	GPS✔ technology	1	
6.1.4	Companies may share and/or sell your location data to other companies which you did not allow/want to know your whereabouts✔	1	7
6.2	Any THREE of the following✔✔✔: - Cost/Lack of finances/Profitability - Poorly written/designed systems - Information overload - Lack skills/skilled people - Poor supporting infrastructure - Fear of ICT, etc.	3	3
6.3.1	The world viewed as a small place ✔because of the increased ease and speed of communication and information available✔.	2	
6.3.2	Advantage : (Any one of ✔ You may find the cell phone cheaper online The phone might not be sold in your country You have the latest device before anyone else Disadvantage : Any one of ✔ It may not be covered under a local manufacturer's warranty(grey / // import) You may have to pay customs tax It is costly/time consuming to return/ship if faulty or if it is the wrong item delivered etc.	2	4

6.4.1	This means that employees from India will be contracted/ paid to run/handle (local) complaints from their location abroad(overseas) ✔	1	
6.4.2	Cheaper/Cheap labour✔	1	
6.4.3	Sweet manufacturing✔ This is a repetitive task✔ which is better suited to robots/robotics as opposed to customer complaints which needs more human emotion in response to customer complaints	2	
6.4.4	Any ONE of the following✔ Job losses for human employees when replaced by robots Robots are costly to build/maintain initially Robots can malfunction/breakdown get infected with viruses etc.	1	5
6.5.1	Acceptable Use Policy✔, a set of rules of what you may or may not do✔ on the computers/network✔.	3	
6.5.2	Any TWO of the following✔✔: - May not download anything - May not install anything on the computers - No piracy, - No inserting flash drives etc. etc.	2	5
6.6.1	False✔ Firewalls block unauthorised connections to or from the Internet. ✔	2	
6.6.2	False✔ Even though very few viruses are around, there have been cases ✔	2	4
6.7.1	Loss of quality ✔	1	
6.7.2	JPG is for pictures ✔ Any ONE ✔ of • MPEG-2, • MPEG-4, • 3GP	2	
6.7.3	Lossless compression ✔ Either WinZip ✔, or 7 Zip	2	5
		TOTAL QUESTION 6 :	**[33]**
		GRAND TOTAL:	**150**