basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 12

INFORMATION TECHNOLOGY P2

NOVEMBER 2017

MARKING GUIDELINES

MARKS: 150

These marking guidelines consist of 16 pages.

SECTION A: SHORT QUESTIONS

QUESTION 1

1.1	1.1.1	A✓	(1)
	1.1.2	D ✓	(1)
	1.1.3	A ✓	(1)
	1.1.4	C✓	(1)
	1.1.5	B ✓	(1)
1.2	1.2.1	Hotspot ✓	(1)
	1.2.2	Hot swappable/pluggable ✓	(1)
	1.2.3	Computer worm ✓	(1)
	1.2.4	Botnet/Bots/Zombie PC's ✓	(1)
	1.2.5	Wiki ✓	(1)
	1.2.6	Firewall ✓	(1)
	1.2.7	(Update/delete) anomaly ✓ or redundancy	(1)
	1.2.8	Push ✓ technology/notification	(1)
	1.2.9	Rootkit ✓	(1)
	1.2.10	Overflow ✓	(1)

TOTAL SECTION A: 15

SECTION B: SYSTEMS TECHNOLOGIES

QUESTION 2

2.1 2.1.1 Windows ✓ (1)

2.1.2 *Any THREE functions of an operating system*: ✓✓✓
- Supply an interface/GUI/UI
- Manage all the processes and tasks/apps/software
- Manage the computer memory/RAM
- Manage the input and output to and from the computer system
- Manage all disk drives/hardware (3)

2.1.3(a) *Multitask processing:*
The computer appears to run multiple programs ✓ at the same time/simultaneously by sharing processing time of the CPU ✓ between processes/tasks

Concepts:
- *Any indication of multiple programs/applications*
- *Sharing of CPU time between programs* (2)

2.1.3(b) *Multithreading:*
When a single program is broken up into independent parts/threads✓ that run at the same time ✓.

Concepts:
- *Program/application is split into parts/threads*
- *Independent processing* (2)

2.2 4/multiple processor cores ✓ on one CPU chip (1)

2.3 Any TWO ✓✓
- The amount of RAM that can be addressed by the operating system (32 bit and 64 bit operating system) is limited
- The number of RAM slots on the motherboard is limited
- The cost of RAM – expensive
- RAM stores current instructions being processed
- The hard drive is storage of all data/software (2)

2.4 2.4.1 *Any ONE* ✓
- Allows connection/access to the Internet/different networks
- Explanation of routing (1)

2.4.2 LTE/Wi-Fi ✓ (1)

2.5 A graphics card generates images ✓ faster using the GPU (graphics processor unit).
The use of a separate video card will allow the CPU to focus on carrying out program instructions ✓ thus reducing the load on the CPU.

Concepts:
- *Generation of images/graphics card has own processor*
- *Taking load away from CPU/GPU is faster at generating images* (2)

2.6 Cache memory is high speed memory that stores data and instructions ✓ most likely to be needed next by the CPU, preventing the CPU from having to load it from the slower RAM ✓

Concepts: *Any TWO*
- *Cache is high speed memory*
- *CPU does not have to fetch data and instructions from slower RAM*
- *Stores data and instructions most likely to be needed next by the CPU*

1 mark only: Caching is preventing a slow process from slowing down a faster process (2)

2.7 2.7.1 The operating system detects the new device ✓and installs the drivers automatically ✓

OR

The flash drive makes itself known to the operating system and then the operating system configures the drivers for use

Concepts:
- *Operating system detects new device*
- *Installation of device drivers/automated configuration* (2)

2.7.2 By sending a hardware interrupt signal (IRQ) ✓ (1)

2.8 Allows the user to access the latest version of the files ✓
on different devices. ✓
OR
Changes in files are automatically updated between devices

NOTE:
Do not accept: add or access from anywhere/online/backup (2)

2.9 Indexing the files means that the operating system has an index that includes the text inside the files as well as the file names. ✓
It allows you to search for words or phrases that you can remember that might be inside the document instead of just for a file name. ✓

Concepts:
- *Storing additional information about the files/content of files*
- *Faster/easier location of files* (2)

2.10 2.10.1 *Any ONE* ✓

- SSD
- ROM
- EEPROM
- Hard drive (HDD) (1)

2.10.2 *Any TWO* ✓✓

- Smaller display areas
- Input constraints/limited number of input devices
- Limitation in hardware/processing capabilities
- Limited memory
- Limited storage space on mobile devices
- Extending battery life/limiting power usage
- Availability of facilities such as GPS/Accelerometer, etc.
- Compatibility between devices
- The amount of data that the application will use (2)

TOTAL SECTION B: 27

SECTION C: COMMUNICATION AND NETWORK TECHNOLOGIES

QUESTION 3

3.1 3.1.1 *Any ONE* ✓
- UTP/STP (CAT 5/CAT 6)
- fibre optic cables

Also accept: co-axial cables (1)

3.1.2 Star ✓ (1)

3.1.3 (a) TCP/IP (IPv4/IPv6) /ınternet protocol ✓ (1)

3.1.3 (b) http/https ✓ (1)

3.2 The user can log on over a public network ✓ like the Internet with the same, if not better, benefits of privacy and security ✓ of a LAN.

Concepts:
- *Secure log on/secure connection*
- *From remote location/over Internet/public network* (2)

3.3 3.3.1 Invisible ✓ data capturing (1)

3.3.2 Any ONE real life example of data capturing ✓and explanation ✓

- Buying with credit card or using a loyalty card – type of products you buy/information on your lifestyle
- Completing forms – extra information that is not always relevant to form/form does not only go to intended recipient
- Via the Net – sites you visit or bookmark/comments on social networks/content of e-mails
- Using e-tags – travel habits/locations visited
- Telecommunication system – who you call/where you are – predict lifestyle etc.

Or any other valid example that leaves an electronic trail

NOTE:
Do not accept any indication of theft of personal information (2)

3.3.3 Purpose of targeted marketing/supplied information. ✓ (1)

3.4 *Any THREE:* ✓✓✓

- JavaScript/Browser side scripting
- Server side instructions/scripting/code
- SQL stored procedures
- AJAX
- Applescript
- HTML4/HTML5
- PHP
- jQuery
- Python
- Ruby

Or any acceptable verifiable scripting language (3)

3.5 3.5.1 *Cookie:*
A text file ✓ stored on your local computer that is used to save user settings/preferences ✓ for a website. (2)

3.5.2 *Any ONE effect of deleting a cookie*: ✓

- Loss of interactivity
- The next time you open that webpage only default settings are available
- Website/page loads more slowly (1)

3.6 *Any TWO disadvantages of using VoIP:* ✓✓

- Need an Internet connection
- Both users need the same software
- Need to purchase credits to call phones not on the Internet
- Poor call quality (when using a slow connection)
- Data cap can be reached quickly/uses data (2)

3.7 *Any ONE* ✓

- Allows one to locate the position of devices/people
- Navigation capabilities
- Global position system
- Geotagging

Or any other acceptable positioning example (1)

3.8 3.8.1 DRM (*Digital Rights Management*) refers to any software which uses some form of encryption ✓ and manages access ✓ to the content of electronic media

Concepts:
- *Software using encryption/prevents copying*
- *Manages access/rights to electronic content/media* (2)

3.8.2 *Any ONE area of application of DRM software* ✓

- Digital books
- Movies/music
- Computer games/software/apps (1)

TOTAL SECTION C: 22

SECTION D: DATA AND INFORMATION MANAGEMENT

QUESTION 4

4.1 4.1.1 *Any ONE reason why ID field may not be integer data type:* ✓
- Leading 0's will not be saved
- Size of ID numbers will exceed integer capacity/storage size of an integer/number of bytes (1)

4.1.2 *Any ONE reason why no other field can be the primary key:*✓
- All the other fields can contain duplicate values
- Only **JobCardNumber** will contain unique values (1)

4.1.3 Since the **DateStarted** and **DateCompleted** fields are available ✓, the **NumDaysTaken** field can be calculated (1)

4.1.4(a) ID ✓ (1)

4.1.4(b) tblJobCards ✓ (1)

4.2 *Any ONE explanation of verifying information*: ✓

- Ensuring that information corresponds to original information at the source
- Ensuring that one can prove that data is correct/confirming correctness (1)

4.3
- Extract only the first character of the gender entered ✓
- Change the character to uppercase ✓

Also accept: code/algorithm. (2)

4.4 4.4.1 SELECT OrderNum, Description, OrderDate ✓
FROM tblEquipment ✓
WHERE Delivered = false ✓
AND year(OrderDate) = 2016 ✓

Alternative statements:
- AND OrderDate like "2016%"
- AND Year(OrderDate) like "2016%"
- AND OrderDate between #2016/01/01# and #2016/12/31#
- AND MID(Str(OrderDate),1,4) = "2016"
- AND OrderDate > = #2016/01/01# AND OrderDate = < #2016/12/31#
- AND OrderDate > #2016/01/01# AND OrderDate < #2016/12/31#

NOTE:
AND should be marked with the second condition (4)

4.4.2 UPDATE tblEquipment ✓
SET Delivered = true ✓
WHERE Description = "Broom" ✓

Alternative:
WHERE Description like "Broom%" (3)

4.4.3 SELECT Teacher, ✓
count(*) as numOrders ✓
FROM tblClassroom, tblEquipment ✓
WHERE
tblClassroom.RoomNumber = tblEquipment.RoomNumber ✓
GROUP BY Teacher ✓

OR

SELECT Teacher, count(*) as numOrders FROM tblClassroom INNER JOIN tblEquipment ON tblClassroom.RoomNumber = tblEquipment.RoomNumber GROUP BY Teacher

NOTE:
- Can use LEFT JOIN or INNER JOIN
- Make use of aliases
- Count any field (5)

TOTAL SECTION D: 20

SECTION E: SOLUTION DEVELOPMENT

QUESTION 5

5.1 5.1.1 *Any TWO advantages of modular programming:* ✓✓
- Easier to debug/fewer bugs
- Reuse of code/Avoids duplication of code
- Can be used by other classes/units/programs
- Allows library programs to be inserted thereby saving time.
- Different programmers can work on specific modules based on their expertise
- Collaboration/many programmers can work on same progam
- Shorter algorithms makes the module easier to trace and understand (2)

5.1.2 A *private* function is only accessible from within ✓ the class / unit /form
A *public* function is accessible from outside ✓ the class/project /form (2)

5.2 5.2.1 True ✓ (1)

5.2.2 False ✓✓ (2)

5.3 Loop from 1 to length of word ✓
reverseWord (✓ addition) ← word[loop] ✓+ reverseWord; (✓order)
OR
Loop from length of word down to 1
reverseWord ← reverseWord + word[loop]

Concepts:
- Loop through word
- Extract character (logic of code must be correct)
- Add onto new word
- Order of addition (4)

5.4 5.4.1 iSum := iSum ✓+ arrLightBulbs ✓ [loop ✓, loop ✓];

Also accept:
4 marks - iSum := iSum + arrLightBulbs[r, r];
3 marks – if any other letter is use for both index values
e.g. iSum := iSum + arrLightBulbs[x,x]

If hard coded – max 2 marks (4)

5.4.2(a) Syntax ✓ (1)

5.4.2(b) Logical ✓ (1)

5.4.2(c) Syntax ✓ (1)

5.4.3 *Reset*: (any ONE) ✓
- Opens an existing text file for reading
- Moves the file pointer to the first record

Rewrite: (any ONE) ✓
- Creates a new text file
- It clears the content of the existing file

Do not accept: Writing to file (2)

5.5 5.5.1(a) Any ONE: ✓

- Object cannot create/instantiate itself
- Object does not exist
- Need to use class name with create

Do not accept:
- Not allocated to a variable
- Rewriting of code (1)

5.5.1(b) Incorrect order of arguments/parameters ✓ (1)

5.5.1(c) Any ONE ✓

- Incorrect data type/type mismatch – string and integer
- There should not be inverted commas around the number (1)

5.5.2(a) Mutator ✓

Also accept: Auxiliary (1)

5.5.2(b) Auxiliary ✓ (1)

TOTAL SECTION E: 25

SECTION F: INTEGRATED SCENARIO

QUESTION 6

6.1 *Any TWO* ✓✓
- IT technician
- Network engineer
- Network architect
- Network administrator
- Network analyst

Do not accept:
- Programmer
- Any job related to database/database administrator (2)

6.2 6.2.1(a) *Biometrics*:
The use of personal characteristics ✓ to authenticate the identity of a person

Also accept: Use parts of the body for access control (1)

6.2.1(b) *Any ONE suitable example of biometrics in this scenario:* ✓
- Retina/eye
- Fingerprint
- Voice recognition
- Facial recognition
- Palm readers (1)

6.2.2 *Any TWO* ✓✓
- RFID cards can be read from a distance that can trigger the unlocking of the room even when not required
- Cards do not validate the identity of the user
- Cards can be stolen/lost
- Cards can be cloned
- Inconvenience of carrying cards around
- Cost of manufacturing cards (2)

6.3 6.3.1 *Virtual memory:*
Hard drive space/storage ✓ reserved by the operating system to be used as RAM/memory ✓

Also accept for 2 marks: Hard drive space to be used when the RAM is full (2)

6.3.2 Operating system ✓ (1)

6.3.3 *Any ONE way to limit the use of virtual memory:* ✓
- Add more RAM
- Do not open too many applications/Close applications not in use (1)

6.4 *Lossless* – no data is lost ✓
Lossy – some insignificant data is lost ✓ (2)

6.5 6.5.1 *Protocol:*
A set of rules ✓ for transmission of data across a network/encoding and decoding data for transmission. ✓ (2)

6.5.2 (Sending) e-mail ✓ (1)

6.6 6.6.1 *Distributed database:*
Parts of a database ✓ are spread over multiple servers in different locations ✓

Concepts:
- Splitting database
- Multiple locations (2)

6.6.2 *Any TWO advantages of distributed database:* ✓✓

- 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 still be used
- Lower cost of communication as less data is being communicated (2)

6.7 6.7.1 *Any ONE : Web 1.0:* ✓✓

- Mainly static web pages
- Each user sees the same content every time/no interactivity.

Also accept for 1 mark: Few content creators, many users (2)

6.7.2(a) *The Semantic Web:*

Has the ability to interpret information ✓ like humans and provide useful content tailored to user needs/personalization. ✓ (2)

6.7.2(b) The Internet of Things ✓ (1)

6.8 6.8.1 Online seminar ✓ (1)

6.8.2 *Any ONE* ✓

- Comfort of own office/home
- Saving on travel costs/time
- Expand knowledge base

OR any other acceptable answer (1)

6.9 6.9.1 *SaaS:* Software as a Service ✓ (1)

6.9.2 *Any ONE - Cloud applications:* ✓✓

- Software where most of the processing is done in the cloud/the processing is done by servers which are accessible via the Internet
- The interface is created on the web servers/on local computers using apps or interface is accessed through a web browser

Concepts: Any TWO
- Local user interface
- Software/applications run on servers on the web
- Servers/service are accessible via Internet (2)

6.9.3 *Any TWO disadvantages associated with using online services:*✓✓

- Software is not owned and a regular fee needs to be paid.
- Cost of data used when everything is transferred from the cloud can be high.
- When Internet is down, software cannot be accessed.
- When the service is down, software cannot be accessed.
- Exposure to security issues when documents are stored in cloud.
- Too many users can slow down the service. (2)

6.10 RSS is a web or news feed/automatic ✓provision to users of updated content✓ and/or notifications of new content from websites (2)

6.11 6.11.1 *Any TWO responsible uses of social networking sites* ✓✓

- Limit time on web/Turn off notifications when doing important work/Switch off mobile device at specific times
- Try to remove yourself from FOMO
- Refrain from insulting other people/Bullying
- Be aware that all posts are public
- Be aware that the Internet never forgets information/cannot delete information from the Internet
- Do not share personal information e.g. ID number or bank account numbers
- Do not befriend strangers

OR any suitable answer (2)

6.11.2 *Any TWO reasons why cybercrime is prevalent:* ✓✓

- Low risk of physical danger to criminal/not physically present when crime is committed
- Difficult to detect a crime
- Difficult to trace who committed the crime
- Increase use of Internet
- Increased number of online financial transactions
- People's general ignorance and carelessness (2)

6.11.3 Piggybacking ✓ (1)

6.12 6.12.1 A machine that have a certain amount of autonomous flight capabilities, while still being controlled by a human.✓

OR any similar explanation

Accept: control of flying object (1)

6.12.2 *Any TWO benefits of 3D printing* ✓✓

- No other complicated machinery needed for manufacturing
- Parts can be computer designed and directly printed
- Easy to change design and print again
- Parts that fail can easily be printed again
- No waiting period for ordered parts
- More cost effective for small numbers

OR any other acceptable answers (2)

TOTAL SECTION E: 41
GRAND TOTAL: 150