Province of the
EASTERN CAPE
EDUCATION

NATIONAL SENIOR CERTIFICATE

GRADE 12

SEPTEMBER 2013

INFORMATION TECHNOLOGY P2

MARKS: **180**

TIME: **3 hours**

INFDM2

This question paper consists of 12 pages.

INSTRUCTIONS AND INFORMATION

1. This question paper consists of FIVE sections which are subdivided as follows:

SECTION A:	Multiple-choice questions and matching the columns	(10)
SECTION B:	Hardware and software	(54)
SECTION C:	Applications and implications	(23)
SECTION D:	Programming and software development	(29)
SECTION E:	Integrated scenario	(54)

2. Answer ALL the questions.

3. Read ALL the questions carefully.

4. The mark allocation generally gives an indication of the number of facts/reasons required.

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

6. Write neatly and legibly.

SECTION A: MULTIPLE-CHOICE QUESTIONS AND MATCHING THE COLUMNS

QUESTION 1

Various options are provided as possible answers to the following questions. Choose the answer and write only the letter (A–D) next to the question number (1.1–1.10) in the answer book.

1.1 A recommended way to connect a cellphone to other devices (such as hands-free kits, other cellphones, etc.) is ...

A infrared.
B a USB cable.
C 802.11g wireless.
D Bluetooth. (1)

1.2 The connection on the motherboard between the CPU and RAM is known as the ...

A CLI.
B PCI.
C USB.
D FSB. (1)

1.3 The North Bridge is ...

A a set of capacitors which reduce current drawn by the motherboard.
B a chipset on the motherboard connecting to faster motherboard components.
C a form of Dynamic RAM.
D a link between the CPU and keyboard. (1)

1.4 What does the following code, when executed, do?

```
Var
sString1, sString2, sString3, sString4: string;
Begin
  sString1 := edtText1.text;
  sString2 := edtText2.text;
  sString3 := edtText3.text;
  sString4 := edtText4.text;
  edtText1.text := 'sString4';
  edtText2.text := 'sString3';
  edtText3.text := 'sString2';
  edtText4.text := 'sString1';
end;
```

A The code swops digits and words around.
B The code does nothing. There is a syntax error.
C The code swops the text in the edits around.
D The code puts the text 'sString4' into edtText1, 'sString3' into edtText2, etc. (1)

1.5 A search engine ...

A is automatically loaded when you activate an internet browser.
B can be used to send and receive e-mails.
C is software which enables the user to find websites pertaining to a research topic.
D is browser software which locates all existing URL's which fit a given description on the internet. (1)

1.6 The preferred method of physically carrying large amounts of data around for daily use, is using a(n) ...

A floppy disk.
B magnetic tape.
C external hard drive.
D DVD-ROM. (1)

1.7 Memory, compared to storage, is ...

A faster and smaller.
B slower and larger.
C faster and larger.
D no different as they are the same thing. (1)

1.8 An example of a smartphone:

A A handset which can receive e-mails.
B When Skype is used on a network PC.
C A cellphone which has internet connectivity and provides a GUI.
D One which keeps track of all incoming and outgoing calls. (1)

1.9 A firewire port is ...

A slower than a USB1 port.
B normally used to connect a printer to a PC.
C best suited to video communications.
D normally used to connect the BIOS to the CPU. (1)

1.10 A PDA is a (an) ...

A handheld device with an operating system and applications useful to a mobile office worker.
B early cellphone.
C very powerful computer.
D type of database software. (1)

1.11 Match COLUMN A with the correct answer in COLUMN B. Write down only the question number and the matching letter in COLUMN B in your answer book.

COLUMN A		COLUMN B	
1.11.1	NTFS	A	Update regularly
1.11.2	Anti-virus software	B	Graphical interface to an application
1.11.3	HSDPA	C	Value to the company besides physical assets
1.11.4	DLL	D	Asymmetric Digital Subscriber Line
1.11.5	Multitasking	E	Dynamic Link Library
1.11.6	ADSL	F	Asynchronous Digital Subscriber Line
1.11.7	Security threat	G	Windows file system
1.11.8	SQL	H	Processing type
1.11.9	GUI	I	Driver Link Library
1.11.10	Intellectual property	J	High speed cellular internet connection method
		K	Spyware
		L	Databases

(10 x 1) (10)

TOTAL SECTION A: 20

SCENARIO

You are employed in a large sweet and chocolate factory. As outreach, your IT team offers its services to local schools and NGOs.

SECTION B: HARDWARE AND SOFTWARE

QUESTION 2

2.1 You are helping an NGO set up their office PCs and they need some information.

2.1.1 The manager of the NGO has heard of hardware and software and asks you for an explanation of these terms. Describe hardware and software and give TWO examples of each. (6)

You suggest to the NGO manager that the Ubuntu Linux operating system be loaded on all the machines because of its stability and its multitasking abilities.

2.1.2 What is an operating system? (3)

2.1.3 Besides its stability, name another advantage of the Ubuntu Linux operating system. (1)

2.1.4 Explain the term *multitasking*. (2)

2.1.5 Explain what *multithreading* is. (3)

2.1.6 Give a practical example of multithreading taking place when using a computer. (1)

You suggest the setting up of a Wi-Fi hotspot in the NGO's boardroom.

2.1.7 What is *Wi-Fi*? (2)

2.1.8 Give FOUR advantages and FOUR disadvantages of Wi-Fi. (8)

One of the staff at the NGO suggests the machines have Firewire ports to connect flash drives.

2.1.9 Critically comment on the above statement. (3)

A statement has been made that Windows and Linux both support Plug-and-Play and therefore additional hardware will not need drivers.

2.1.10 Explain why this statement is incorrect. (3)

2.1.11 Explain the term *Plug-and-Play*. (3)

2.1.12 In the context above, explain what a driver does. (3)

2.2 After discussing various issues relating to hardware and the network, you start chatting about software necessary at the NGO.

2.2.1 Name the TWO broad categories of software. (2)

2.3 Every computer on the network requires an operating system. You have decided on Ubuntu Linux. The NGO's network administrator is comfortable in this environment.

2.3.1 Name THREE specific functions that a network operating system must perform. (3)

2.3.2 One concern is privacy of documents on the network. Discuss TWO duties of the network administrator regarding security. (2)

2.3.3 List THREE other duties of the network administrator. (3)

2.4 The NGO requires doing internet banking in the organisation. One of the staff suggests this is a bad idea because of the security risks of these transactions.

2.4.1 Comment critically on this statement by referring to ONE type of possible risk. (4)

2.4.2 Describe TWO ways the bank can improve security for the customer. (2)

TOTAL SECTION B: 54

SECTION C: APPLICATIONS AND IMPLICATIONS

QUESTION 3

3.1 At one of the schools you support, you are asked to do some training. You give the learners a project to complete. You explain that learners must be aware of computer ethics when they use the internet to do research for their projects.

3.1.1 What is computer ethics? (2)

3.1.2 Discuss TWO examples of unethical internet behaviour. (2)

3.2 Technology is used extensively at schools. They are, however, very aware of what is termed "the Digital Divide".

What is the "*Digital Divide*"? Explain your answer. (2)

3.3 One of the staff at the school gets quotes to replace some ageing machines in the lab. The seller offers to reduce the price of the five machines by R5 000 if she can supply the machines without disks. Do you think she should accept this offer? Substantiate your answer. (3)

3.4 The school wants to use computers for buying over the internet and paying accounts. List THREE advantages for the school and THREE advantages for businesses, of this approach. (6)

3.5 Explain the following terms:

3.5.1 *Spam* (2)

3.5.2 *Phishing* (3)

3.5.3 *Hacker* (3)

TOTAL SECTION C: 23

SECTION D: PROGRAMMING AND SOFTWARE DEVELOPMENT

QUESTION 4

Part of your job at the sweets factory is to design software around databases. This is a field you are passionate about and have lots of experience. The work involves designing databases and writing Object Oriented Code to manipulate the data. You also have to manipulate data between different systems which requires text files to transfer the data.

4.1 You have to write a program to read data from a CSV file, rearrange the data in a different order and write it back to a new CSV file for import into *Access*.

4.1.1 Expand the acronym *CSV*. (1)

4.1.2 What kind of loop would you use to read the data from the text file? Explain your choice. (3)

4.1.3 If you needed to sort the data, what type of data structure would you need to read the data into? (2)

4.2 A friend at work has a B&B and is trying to write a program which will help him with the catering of lunch and dinner for guests who request these meals. Lunch is at 13:00 while dinner is at 19:00. The closing times for bookings, is an hour before the meal.

Your friend has designed the following algorithm.

1. Open the file
2. Read the first line and assign to Date
3. Repeat until end of file
4. Read the next line
5. Extract the name and time
6. If the time < = 12:00 then
7. Add name to lunch list
8. If the time < = 18:00 then
9. Add name to dinner list
10. End of loop
11. Close the file

The input file has the following format

28/04/2013
Jim,09:25
Jane,09:26
Suzanne,12:02
Sipho,14:47
Naledi,17:04

The above data implies the first two names for lunch and the latter three for dinner.

4.2.1 The algorithm results in a logical error. Identify the statement that causes the error and rewrite the statement in order to correct the error. (4)

4.2.2 What is the difference between a logical error and a syntax error? (4)

4.2.3 What is the error called where the result is too large for the data type to hold? (1)

4.3 In terms of Object Oriented Programming, describe the following terms:

4.3.1 *Data abstraction* (4)

4.3.2 *Encapsulation* (2)

4.4 SQL is used to manipulate data and tables in a database.

4.4.1 Expand the acronym *SQL*. (1)

4.4.2 Write SQL code to display all fields in the table SWEETS. You only want the CHOCOLATE sweets shown. The field differentiating the sweet type is "SWEET-TYPE". (3)

4.4.3 Write down the general format of the UPDATE command in SQL. (4)

TOTAL SECTION D: 29

SECTION E: INTEGRATED SCENARIO

QUESTION 5

Your internal network is going through a review. Changes are going to be made to how the networking currently works, software deployment and security. This is all to enable travelling workers the opportunity to have access to their documents and systems while away. The local offices require to be connected to the central factory and the central factory is required to be connected to all its branches throughout the country.

5.1 The first priority is to define the configuration for the local network. You decide on UTP to connect PC's and Wi-Max to connect some buildings.

5.1.1 What does *UTP* stand for? (1)

5.1.2 What is the maximum recommended length between nodes for a UTP cable? (1)

5.1.3 Describe *Wi-Max*. (2)

5.1.4 What would Wi-Max be useful for in this scenario? (1)

5.1.5 What would be an alternative to wireless to connect buildings if the distance between them is, say, 500 m? Substantiate your answer. (2)

5.1.6 One of the disadvantages of Wi-Max is that it can be used without permission if the network is not secure. Briefly explain how this can happen. (2)

5.2 Modern networks use the TCP/IP suite of protocols almost exclusively. It has been decided TCP/IP will be used on the sweets factory's network in a star topology.

5.2.1 What is a *protocol*? (2)

5.2.2 TCP/IP is considered to be a suite of protocols. Name and describe THREE protocols in this suite. (6)

5.2.3 What is meant by a "*network topology*"? (1)

5.2.4 Draw ONE network topology and label the parts. (3)

5.3 You have decided on the server's network configuration to employ in the new setup.

5.3.1 Name the TWO server configurations which one can use in a network. (2)

5.3.2 Which ONE would you suggest be used? Give a reason for your choice. (2)

5.4 You are going to employ a hardware RAID in the server.

5.4.1 With which hardware subsystem does RAID work? (1)

5.4.2 You decide to use RAID level 1. Describe this configuration. (3)

5.5 The processor you select for the server is a very powerful XEON processor with multiple cores.

5.5.1 Name the FIVE components into which a CPU is divided. (5)

5.5.2 Describe THREE of the components named in QUESTION 5.5.1. (3)

5.5.3 The CPU operates in a four step cycle, known as the Machine Cycle. Name these FOUR steps. (4)

5.5.4 Describe the term *multiprocessing.* (2)

5.6 You have to set up a link into the internet. A firewall has also been configured.

5.6.1 What is the function of a firewall? (3)

5.6.2 How does a firewall achieve this? Refer to the concept of 'Ports' in your answer. (2)

5.7 Part of your security plan is to include an effective anti-virus strategy.

5.7.1 Describe a computer virus in your own words. (3)

5.7.2 State THREE ways viruses can be passed on between computers. (3)

TOTAL SECTION E: 54
GRAND TOTAL: 180