



Province of the
EASTERN CAPE
EDUCATION

**NATIONAL
SENIOR CERTIFICATE**

GRADE 12

SEPTEMBER 2015

INFORMATION TECHNOLOGY P2

MARKS: 150

TIME: 3 hours



This question paper consists of 14 pages.

INSTRUCTIONS AND INFORMATION

1. This question paper consists of SIX questions:

SECTION A:	Multiple-choice questions	(10)
SECTION B:	System Technologies	(20)
SECTION C:	Communications and Network Technologies	(30)
SECTION D:	Data and Information Management	(25)
SECTION E:	Solution Development	(25)
SECTION F:	Integrated Scenario	(40)

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**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 Using someone else's Internet connection without paying for it is also called ...
A piggybacking.
B theft.
C stalking.
D piracy. (1)
- 1.2 A computer system designed to gather information from a wide range of sources, analyse it, and present it in summarised or graphical format that aids in decision making is also called ...
A DBMS.
B SQL.
C DSS.
D DMS. (1)
- 1.3 Solid state drives (SSDs) use a special type of ... memory.
A electric
B mechanical
C magnetic
D electronic (1)
- 1.4 A small piece of software that has been designed to fix a specific bug in a program is called a ...
A patch.
B bugger.
C toolkit.
D doc. (1)
- 1.5 Fat clients ...
A run most of their applications from their local hard drives.
B have lower hardware specifications.
C depend almost completely on a server to run applications.
D are powerful computers. (1)

- 1.6 An intranet is a ...
- A network operating system.
 - B network filing system.
 - C private company network.
 - D global network. (1)
- 1.7 Spooling means to ...
- A send an interrupt request to the printer.
 - B send a print file to a file on the hard drive.
 - C swop pages between the virtual memory and the hard drive.
 - D print pages in reverse order. (1)
- 1.8 A value parameter ...
- A has a 'var' in front of it.
 - B receives information that is sent via arguments to the method.
 - C determines the largest value.
 - D is only used in procedures. (1)
- 1.9 Programs that add value and features to your system especially in terms of maintenance and security are called ...
- A drivers.
 - B firewalls.
 - C anti-virus software.
 - D utilities. (1)
- 1.10 RSS ...
- A downloads audio or video files to your device so you can watch them later.
 - B downloads any new content automatically without the user needing to log on to those sites.
 - C collects data and instructions from memory.
 - D prevents you from receiving e-mails. (1)

TOTAL SECTION A: 10

SECTION B: SYSTEM TECHNOLOGIES**QUESTION 2**

- 2.1 Computers are made up of many parts.
- 2.1.1 What is the term used to describe the above type of design? (1)
 - 2.1.2 State TWO reasons why it is easier for computers to be made up of many parts, rather than being one functioning unit. (2)
 - 2.1.3 Where would you connect a new CPU to the motherboard? (1)
- 2.2 The CPU does almost all the work in a computer.
- 2.2.1 List the FOUR steps of the machine cycle. (4)
 - 2.2.2 There are TWO factors of the CPU that can influence the performance of a computer. These factors are speed and the core. Describe each briefly. (4)
 - 2.2.3 The two main categories of processors are 32-bit and 64-bit. Apart from speed performance, name ONE other major difference between 32-bit processors and 64-bit processors. (1)
 - 2.2.4 Most CPUs nowadays have superscalar architecture. What does *superscalar* mean? (2)
 - 2.2.5 When a CPU is described as 'Quad Core', what type of processing technique is used that cannot be used by a single processor? (1)
- 2.3 Software as a service (SaaS) has become more common.
- 2.3.1 Briefly explain the concept of SaaS. (2)
 - 2.3.2 Differentiate between cloud-based apps and downloadable apps as two different forms of SaaS. (2)

TOTAL SECTION B: 20

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

- 3.1 Life without Internet is unimaginable. To enable Internet connection, you need a computer or any other Internet-enabled device, an Internet service provider (ISP), Internet connection and software.
- 3.1.1 Define the term *Internet*. (2)
- 3.1.2 Describe what an ISP is. (2)
- 3.2 There are TWO main methods of connecting to the Internet, namely wired through ADSL and wirelessly using cellular technology.
- 3.2.1 Give TWO advantages of using ADSL as opposed to cellular connection. (2)
- 3.2.2 A modem and a router are associated with Internet connection. Differentiate between these two devices. (2)
- 3.2.3 Does one need to purchase a separate modem and router when setting up a home network? Supply a reason for your answer. (1)
- 3.2.4 WiMax is an upgrade on WiFi. Apart from the increase in speed, how has WiMax improved over WiFi? (1)
- 3.3 When using a search engine such as Google, it happens that the advertisements popping up are always applicable to your likes. How is this possible? (2)
- 3.4 The Web has evolved from 'version' 1.0 to 'version' 2.0 and will evolve fully into Web 3.0.
- 3.4.1 Web 1.0 was characterised by static web pages. What do we mean by the term 'static' in this context? (1)
- 3.4.2 Apart from static web pages, what was the major shift from Web 1.0 to Web 2.0? (1)
- 3.4.3 Web 3.0 is often referred to as the 'semantic web'. The semantic web is a web of the future which will allow computers to conduct automated searches for information. How will web pages need to be modified to facilitate or allow this to evolve? (2)

- 3.5 Today most computer devices are connected to some type of network, from a Personal Area Network (PAN) to Wide Area Networks (WAN).
- 3.5.1 Explain what a *Personal Area Network (PAN)* is by referring to its characteristics. (2)
- 3.5.2 Briefly explain what a *Virtual Private Network (VPN)* is. (3)
- 3.5.3 Instead of using VPN, name ONE other method you can use to get the same result as you would through a VPN. (1)
- 3.5.4 What kind of network would it be if all the computers at your school (computer labs, classes and the office) were connected to one another? (1)
- 3.6 BitTorrent is a peer-to-peer protocol.
- 3.6.1 Give TWO benefits of using BitTorrent. (2)
- 3.6.2 Give TWO risks of using BitTorrent. (2)
- 3.6.3 Define a protocol in a network. (1)
- 3.6.4 Name the protocol that is used for communication over a network or the Internet. (1)
- 3.6.5 What protocol will be used to send files between remote computers that have an Internet connection? (1)

TOTAL SECTION C: 30

SECTION D: DATA AND INFORMATION MANAGEMENT

QUESTION 4

4.1 A database management system (DBMS) is software that allows you to work with electronic databases.

4.1.1 List the TWO categories into which DBMS software falls. (2)

4.1.2 What is a distributed database? (2)

4.1.3 Give an example of where a distributed database becomes necessary. (1)

4.2 Study the extract below which is from a database capturing the data of animals sent to different game parks and answer the questions that follow.

Name_Naam	Scientific_Wetenskaplike	Type_Type	Price_Prys	Birth_Geboorte	Age_Oud	Park	Tel	Email_Epos	Town_Dorp
Dumbo	Africana Loxodonta	Elephant_Olifant	R 23 000.00	2010/11/23	5	Addo	041 111 2323	addo@sanparks.org	Addo
Lion King	Panthera leo	Lion_Leeu	R 17 500.00	1999/02/12	16	Kruger	071 112 4432	kruger@sanparks.org	Nelspruit
Olly	Africana Loxodonta	Elephant_Olifant	R 22 000.00	2002/02/02	13	Kragga Kamma	041 338 4451	Kragga@kamma.co.za	PE
Oom Olifant	Africana Loxodonta	Elephant_Olifant	R 15 000.00	1984/10/09	31	Addo	041 111 2323	addo@sanparks.org	Addo
Pumba	Phacochoerus africanus	Warthog_Vlakvark	R 2 750.00	2009/11/30	6	Addo	041 111 2323	addo@sanparks.org	Addo
Vlakkie	Phacochoerus africanus	Warthog_Vlakvark	R 1 200.00	2003/12/13	12	Shamwari	041 334 1343	Shammies@gmail.com	PE

4.2.1 Which TWO anomalies exist in this table? Motivate your answers. (4)

4.2.2 Which field would you consider as redundant? Motivate your answer. (2)

4.2.3 The table needs to be normalised.

(a) Supply TWO rules for normalisation to the first normal form. (2)

(b) Normalise the table and divide it into THREE tables. All original fields must appear in the tables. You may add more fields if necessary. Clearly indicate the following where possible:
 - Primary key(s)
 - Foreign key(s)
 - Relationship between tables (7)

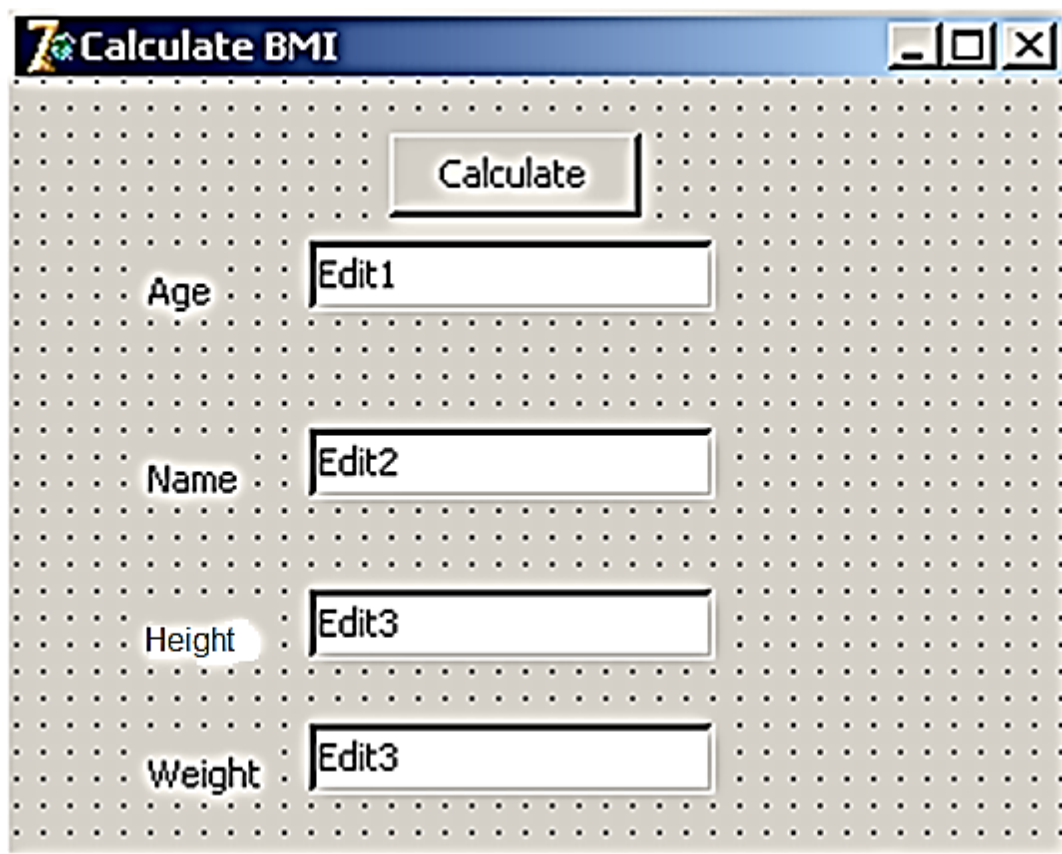
4.2.4 Write an SQL statement to display the Name, Price, Birth date and Park of all the Elephants in the **tblAnimals** table, sorted in alphabetical order by Name. (3)

4.2.5 Dumbo dies. Write an SQL statement to delete Dumbo from the table **tblAnimals**. (2)

TOTAL SECTION D: 25

SECTION E: SOLUTION DEVELOPMENT**QUESTION 5**

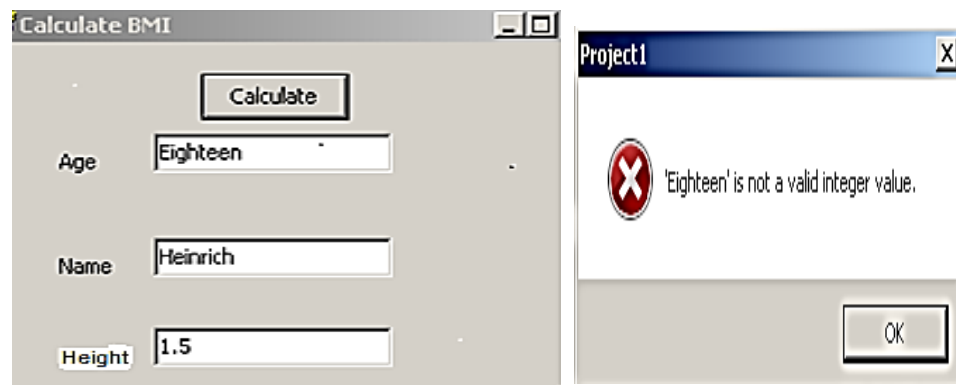
- 5.1 The following is an example of a GUI designed to calculate the BMI of a patient. Study the design and answer the questions that follow.



- 5.1.1 List FOUR ways in which the design layout and user-friendliness can be improved.

(4)

5.1.2 Upon running the program, the following error message occurred.



(a) Why did this error message occur? (1)

(b) List ONE precaution against a message like this that you can take while coding the program. (1)

5.2 Study the algorithm below and answer the questions that follow.

```
Line
1   Number1 ← 7
2   Number2 ← 19
3   If Number1 > Number2 then
4   If Number1 MOD Number2 = 0
5   Then Display
6   Else Display Error
7   If Number2 > Number1 then
8   If Number2 MOD Number1 = 0
9   Then Display
10  Else Display Error
```

5.2.1 What is the purpose of this piece of coding? (2)

5.2.2 Create appropriate messages to be displayed in lines 5 AND 6. (2)

5.2.3 Name the data type used for Number1 and Number2. (1)

5.2.4 If the value of Number2 changes to 0, what kind of error will occur? (1)

- 5.3 You need to create an application that will read the radius of a circle and then display the circumference and area of the circle. The application must make use of a class that will have the radius as attribute and have methods to calculate the circumference and area.
- 5.3.1 Using a parameterised constructor, draw a class diagram to solve the problem mentioned above. (3)
- 5.3.2 What is the purpose of a parameterised constructor? (2)
- 5.3.3 What is the difference between a *private method* and a *public method*? (2)
- 5.3.4 Write a call statement to remove an object from the memory when the program does not need the object any more. (2)
- 5.4 Give an example of an unconditional loop structure. (1)
- 5.5 Examine the following pseudo code and answer the question that follows.

Line

1. Place $\leftarrow$ user input
2. Start loop from Place till NumElements – 1
3. ArrName[loop_value] $\leftarrow$ ArrName[loop_value + 1]
4. NumElements $\leftarrow$ NumElements – 1

Assume the original array is populated as follows:

arrName

Roeltin	Jason	Daniel	Reuben	Quintus	Wian	Jandré
[1]	[2]	[3]	[4]	[5]	[6]	[7]

Assume the input from the user is 3.

Redraw the diagram presenting the **ArrName** in your ANSWER BOOK.
Use the given algorithm and above information to populate the diagram as it will be after the program is executed. (3)

TOTAL SECTION E: 25

SECTION F: INTEGRATED SCENARIO**QUESTION 6**

The executive committee (prefects) of your school wants to set up a small network at school with a few computers. The use of it will be mainly to do their planning, sharing of data and sharing of the printer. Of course they would want Internet connectivity as well.

Joshua, also on the executive committee, is an IT student. He takes the lead in this project.

- 6.1 The layout of the network is the first step. What is the term used to describe the physical layout of a network? (1)
- 6.2 A wireless connection is not possible, so you will have to use cables. The two options are UTP cables or fibre optic cables.
- 6.2.1 State TWO characteristics for each type of cabling mentioned above. (Do NOT refer to the cost.) (4)
- 6.2.2 Which ONE of these two types of cable would you recommend that the executive committee use? (1)
- 6.2.3 Analyse the physical limitations of the different communication media, then list TWO physical limitations that would result in not using WiFi as communication media. (2)
- 6.3 Apart from the medium used to transmit the data, an NIC (network interface controller) is essential to set up a network.
- 6.3.1 Explain what an NIC is by referring to its function. (2)
- 6.3.2 Not all the computers have an NIC. List TWO ways in which this problem can be solved. (2)
- 6.4 Using e-mail for communication between the committee members will be helpful.
- 6.4.1 Unfortunately not all the members of the committee have access to their own e-mail accounts. Distinguish between a web-based e-mail and an ISP-based e-mail. (2)
- 6.4.2 When sending an e-mail through to all the members of the committee, you need to add the e-mail addresses using Cc or Bcc. Evaluate which one will be best. Justify your choice. (2)

- 6.5 One of the biggest threats to a computer room like this is the spread of viruses.
- 6.5.1 Define a *computer virus*. (2)
- 6.5.2 Name the term used to describe any software that is written with negative intentions. (1)
- 6.5.3 Pharming is a huge threat when it comes to using the Internet. Briefly explain what Pharming is. (2)
- 6.5.4 A good anti-virus program can protect your computer against most threats. There are, however, some types of threats that can't be avoided by using anti-virus software. In such cases, a firewall is needed. What is the purpose of a firewall in terms of computing? (2)
- 6.6 One of the complaints that has come to the executive committee's table, is that of cyber bullying. Joshua's IT knowledge is needed. Explain what cyber bullying is. (1)
- 6.7 Learners love social networking and do not always realise how much of an impact social networking can have on them.
- 6.7.1 The life of a social engineer just gets easier by the minute. What is a social engineer? (2)
- 6.7.2 Using social networking can be time consuming. List any THREE practical ways in which you can reduce the number of interruptions in your daily life caused by social networking. (3)
- 6.8 Some of the students are not comfortable with using computers or do not have computers at home, while the other are very comfortable and have been working on computers from a very young age. What is this 'gap' called? (1)
- 6.9 Joshua suggests the use of cloud storage. List TWO disadvantages of *cloud computing*. (2)
- 6.10 There is some confusion between the terms virtualisation and virtual memory. Clear the confusion by defining these two terms. (2)

- 6.11 The treasurer of the executive committee needs to make Internet banking payments.
- 6.11.1 List TWO benefits of using Internet banking. (2)
- 6.11.2 It is important that this person is able to recognise a secure website. List TWO ways to identify a secure website. (2)
- 6.12 Explain how caching increases the processing speed of the processor. (2)

TOTAL SECTION F: 40
GRAND TOTAL: 150