Province of the
EASTERN CAPE
EDUCATION

NATIONAL
SENIOR CERTIFICATE

GRADE 11

NOVEMBER 2018

INFORMATION TECHNOLOGY P2

MARKS: 150

TIME: 3 hours

IINFTE2

This question paper consists of 10 pages.

INSTRUCTIONS AND INFORMATION

1.   This paper consists of SIX sections

       SECTION A: Short questions   (15)
       SECTION B: System Technologies   (24)
       SECTION C: Communication and Network Technologies   (24)
       SECTION D: Data and Information Management   (26)
       SECTION E: Solution Development   (25)
       SECTION F: Integrated Scenario   (36)

2.   Read all the questions carefully.

3.   Answer ALL the questions.

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

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) in the ANSWER BOOK.

1.1.1 Connectors where you plug in the cables that connect your storage devices.

A ZIF.
B SATA.
C DIMM.
D RJ45 (1)

1.1.2 This processing technique allows programs to split CPU time between multiple tasks.

A Pipelining
B Multitasking
C Multithreading
D Multiprocessing (1)

1.1.3 Virtual memory is

A Volatile
B Permanent
C Expensive
D Slow (1)

1.1.4 Social engineering is associated with

(i) Designing social networks
(ii) Maintaining social media records for clients
(iii) Manipulating individuals to give personal information

A (i) and (ii) are correct
B (ii) and (iii) are correct
C Only (ii) is correct
D Only (iii) is correct (1)

1.1.5 Which of the following does not limit ICT?

A Fear
B Government policies
C Well written software
D Profitability (1)

1.1.6   A device that directs data or signal to its intended destination on a network.

A   Hotspot
B   Modem
C   Switch
D   Mouse   (1)

1.1.7   Which one is not part of the machine cycle?

A   Decode
B   Execute
C   Fetch
D   Process   (1)

1.1.8   Which one is a characteristic of quality data in a database?

A   Accuracy
B   Sensitivity
C   Punctuality
D   Readability   (1)

1.1.9   What is the value of 16 MOD 5 DIV 2?

A   0.5
B   0
C   1
D   8   (1)

1.1.10   Which one CANNOT be used in a Boolean expression?

A   X > Y
B   X <> Y
C   X := Y
D   X = Y   (1)

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) in the ANSWER BOOK.

1.2.1   A strategy or technology used to obtain a high ranking placement in the search results page of a search engine.   (1)

1.2.2   A website containing multiple pages, each single file displays exactly the same information every time to the user, just as when it was created.   (1)

1.2.3   The composing, sending and receiving of messages electronically over a network, including the internet.   (1)

1.2.4   Working in decentralised locations whilst using modern communication to 'check in' at a physical office.   (1)

1.2.5   The unnecessary repetition of data.   (1)

TOTAL SECTION A: 15

SECTION B: SYSTEMS TECHNOLOGIES

QUESTION 2

Your computer's performance has not been great and it has been suggested that you do a complete overhaul of the internal components of the computer.

2.1   The motherboard will need to be changed for its newer versions.

      2.1.1   What is a *motherboard*?   (2)

      2.1.2   State the THREE main functions of the motherboard.   (3)

2.2   Your younger brother suggests that you upgrade the BIOS of the older motherboard in order for the motherboard to be faster and more powerful.

      2.2.1   What is the BIOS?   (1)

      2.2.2   List the FOUR main tasks of the BIOS.   (4)

      2.2.3   Where is the BIOS stored?   (1)

      2.2.4   Explain to your brother why you will not implement his suggestion. (1)

2.3   You will also need to upgrade your operating system, and you are being encouraged to look for an operating system that will run processes and threads efficiently. It should be capable of multithreading and multiprocessing.

      2.3.1   What is an operating system?   (1)

      2.3.2   Differentiate between a *process* and a *thread*.   (2)

      2.3.3   Explain what multiprocessing is and provide an example where multiprocessing is used.   (3)

      2.3.4   If the computer has one physical processor, would multithreading be able to take place? Support your answer.   (2)

2.4   You would like to use a high level programming language which has a compiler integrated within it.

      2.4.1   What is a high level programming language?   (1)

      2.4.2   State the main functions of a compiler.   (2)

      2.4.3   Programming languages which have compilers are usually called compiled programming languages. Give ONE example of a compiled programming language.   (1)

TOTAL SECTION B: 24

SECTION C: COMMUNICATION AND NETWORK TECHNOLOGIES

QUESTION 3

You have decided to place 3G/LTE connectivity instead of ADSL connectivity in your living room. A wireless router will be used to connect all your mobile devices and computers to the Internet.

3.1   3G/LTE connectivity is becoming popular in many homes.

    3.1.1   What is 3G/LTE?   (1)

    3.1.2   What medium of data transmission is used in 3G/LTE?   (1)

    3.1.3   Give TWO advantages that 3G/LTE will have over an ADSL connection.   (2)

3.2   All the devices including the Satellite TV decoder, gaming console, mobile phones and tablets in the household will be connected together in this setting by a multipurpose LTE router/modem.

    3.2.1   What is the term used to describe this kind of network?   (1)

    3.2.2   Give TWO advantages and TWO disadvantages of having a network.   (4)

    3.2.3   What are the FOUR main functions of the multipurpose router/modem in this network?   (4)

    3.2.4   Identify the topology that is employed in this environment.   (1)

    3.2.5   Give TWO reasons why you would choose the topology chosen in 3.2.4 over other topologies.   (2)

3.3   One of the reasons to connect the devices to the Internet is watching online television programs. You can either stream or download the programs. Differentiate between streaming and downloading.   (2)

3.4   The majority of the devices connected to networks are mobile devices, and the number of devices seems to be increasing.

    3.4.1   List the THREE main reasons that has driven this growth.   (3)

    3.4.2   Most mobile devices are always on hence the need to save battery power. Advise THREE ways in which battery life can be maximised.   (3)

TOTAL SECTION C: 24

SECTION D: DATA AND INFORMATION MANAGEMENT

QUESTION 4

You have been appointed as a Database Analyst for the planned database of your brother's Primary School. More than 1000 learners attend the school, you have to make a number of presentations to the school management, teachers and governing body.

4.1   One of the governing body members has suggested that you plan for a distributed DBMS instead of a server DBMS.

    4.1.1   What is a DBMS?   (1)

    4.1.2   List THREE activities that a DBMS allows you to do.   (3)

    4.1.3   Explain the main differences between a distributed database and a server database.   (2)

    4.1.4   Explain how a client software application relates to its server DBMS and the underlying database.   (2)

    4.1.5   Give TWO reasons when it becomes necessary for an organisation to have a distributed database.   (2)

4.2   The information retrieved will depend on the quality of data that was entered into the database.

    4.2.1   List THREE characteristics of quality data.   (3)

    4.2.2   Describe TWO methods that can be used to validate the data.   (4)

4.3   A Database Administrator will have to be appointed. List TWO tasks of a database administrator.   (2)

4.4   There are many tables in the database. The primary keys, composite keys and foreign keys need to be identified in order for them to be linked.

    4.4.1   What is a primary key?   (1)

    4.4.2   Differentiate between a foreign key and a composite key.   (2)

    4.4.3   What is the name given to a database where tables are linked together?   (1)

4.5   Whilst analysing the database you have identified two entities namely REGISTER CLASS and LEARNER. You notice that a register class can have many learners and that a learner can only be in one register class. Illustrate this relationship using an ER - diagram.   (3)

TOTAL SECTION D: 26

SECTION E: SOLUTION DEVELOPMENT

QUESTION 5

An application has to be designed to work with the DBMS.

5.1   An *array* containing the names of the leaners will have to be used.

    5.1.1   Define the term *array*.   (1)

    5.1.2   Explain why it would be necessary to use an array instead of other variable types?   (1)

    5.1.3   Elements in the array may need to be arranged in alphabetical order. Name one sorting algorithm that can be used to achieve this.   (1)

    5.1.4   Write down the pseudocode that will be followed in the algorithm that you have mentioned in Question 5.1.3 above.   (4)

5.2   When writing your code for your programs discuss THREE of the basic guidelines to consider.   (3)

5.3   Differentiate between a *variable with class scope* and a *variable with method scope* within a program.   (4)

5.4   When designing your programs, loops and decision making structures can improve programming time if used correctly.

    5.4.1   When is it appropriate to use a loop structure?   (1)

    5.4.2   Describe TWO types of loop structures commonly used in programming.   (4)

    5.4.3   Given the following code, identify THREE lines with errors and write the correct statements. You can add a new line if necessary.

```
1.    Case  iAge in
2.      1..12   : Inc(iChildren);
3.      13..19  : Inc(iteenagers);
4.      20..60  : Inc(iAdults);
5.      61..120: begin
6.      Inc(iAdults) AND Inc(iSeniors);
7.      end;
8.      else Showmessage('Please check age');
9.      end; //end case
```
   (6)

TOTAL SECTION E: 25

SECTION F: INTEGRATED SCENARIO

QUESTION 6

Safety, documentation and the international twinning issues have to be considered and discussed at the school governing body meeting.

6.1 The safety of the data in the school can be threatened, therefore taking away the trust that the parents have in the school management. Malware, human issues and software issues may damage the school's data.

    6.1.1 Describe TWO types of malware that can damage data on a computer. (4)

    6.1.2 List THREE common human errors that contribute to loss of data. (3)

    6.1.3 Explain the GIGO concept which also contributes to messy data. (1)

    6.1.4 Suggest THREE physical measures that can be taken by the school to protect the data on the computers. (3)

    6.1.5 Social networking poses a threat to data. Describe TWO ways in which social networking can become a threat to data. (2)

6.2 The school management team, working together with the network manager and the database administrator, will have to draft AUP documents for end users. The network manager has to specifically set policies, restrictions and firewalls.

    6.2.1 Why is it necessary to set policies, restrictions and firewalls? (1)

    6.2.2 Describe each of the following clearly stating what they are and how they are implemented.

        (a) Policies (1)
        (b) Restrictions (1)
        (c) Firewalls (1)

    6.2.3 What are AUP documents? (1)

    6.2.4 List FOUR aspects that should be included in an AUP document. (4)

    6.2.5 Suggest what should be done for an AUP to work effectively at the school. (2)

6.3   The Dance Society at the school needs to share a video of their dancing competition amongst each other. They are suggesting that you compress the file for better quality.

      6.3.1   Mention the main disadvantage of media compression.   (1)

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

      6.3.3   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)

6.4   The school has recently been twinned to a school in Europe. It has been suggested that since the schools have the same curriculum, some of the lessons will have to be shared with teachers in Europe.

      6.4.1   For this to be effective and successful, list THREE factors that should be considered by both schools.   (3)

      6.4.2   The project has been successful and teachers' jobs have now been made much easier. Identify and explain how TWO other jobs that have been improved by ICT.   (4)

TOTAL SECTION F: **36**

GRAND TOTAL: **150**