education

Department:
Education
PROVINCE OF KWAZULU-NATAL

GREENBURY SECONDAR SCHOOL

INFORMATION TECHNOLOGY P2

GRADE 11

DATE OF EXAM: 21 JUNE 2016

MARKS: 120

EXAMINER(S): AFG/BG/NG/JS [Pinetown]

TIME: 2 ½ hours

MODERATOR(S): AJP/SN [Illembe]

This question paper consists of 10 pages

QUESTION 1 – MULTIPLE CHOICE

1.1   A public wireless network that provides Internet access to mobile computers and handheld devices is referred to as a(n) ...

      A   Cybercafé
      B   Kiosk
      C   Hot Spot
      D   ISP

1.2   Fragmentation occurs when...

      A   you partition your hard drive
      B   the hard drive spins too fast and causes the computer to break into pieces
      C   files are broken up and scattered all over the screen and memory
      D   the file system cannot allocate enough contiguous space to store a file

1.3   Which of the following refers to an encryption technology used to authenticate the identity of the sender of an e-mail message?

      A   Digital certificate
      B   Digital divide
      C   Digital signature
      D   Digital handshake

1.4   Which of the following is **NOT** associated with green computing?
      A   Using Energy Star compliant hardware
      B   The 'Paperless office'
      C   Using refillable toner cartridges
      D   Replacing computer equipment on a four-yearly basis

1.5   Convergence refers to ...

      A   technology that is always on.
      B   technology that does not need to be tethered to wired connections.
      C   functionalities of many devices built into one.
      D   the ability of mobile devices to connect to one another.

1.6   The ... translates an entire program into machine language before execution.

      A   Compiler
      B   Interpreter
      C   Translator
      D   operating system

1.7 Which ONE of the following statements is NOT true?

A An interactive web page might contain code that can be executed.
B Flash-applets might be part of a static web page.
C A static web page can be interactive.
D Facebook is a dynamic website.

1.8 An organisation's private network environment consisting of documents and resources relating to the organisation's business is known as their ...

A Ethernet.
B extranet.
C intranet.
D Internet.

1.9 The BIOS is responsible for ...

(i) primary memory management.
(ii) controlling hardware.
(iii) all logical processing in a computer.
(iv) locating and loading the operating system.

A (i) and (ii)
B (ii) and (iv)
C (iii) and (iv)
D (i) and (iii)

1.10 _____ is a type of control that serves as an 'on/off' or 'toggle' fashion. Selecting it again will clear the option.

A Combo box
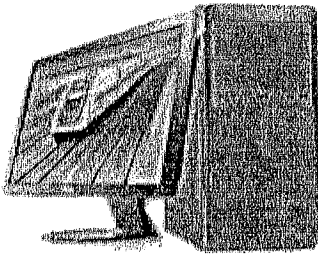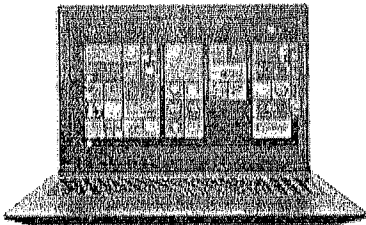B Check box
C Drop down list
D Radio button

10x2 = 20

Scenario:

The Ex-students Society of your school has raised a large sum of money and has offered to upgrade the school library. The funds will be used to computerise the library, employ a full-time librarian and hire technicians as an when required.

Question 2 – Hardware and Software

One of the members of the Ex-students Society provides the adverts below outlining specifications of two different computers. He asks the school to consider acquiring and using these computers in the library.

Advert 1	Advert 2
Phoenix ATX Case 450 Watt PSU H81 DDR3 Motherboard Intel Core i5 4460 3.2Ghz CPU 4GB DDR3 1600Mhz 1TB Hard Drive HDD 24x DVDRW Drive 18.5" LCD Monitor Microsoft Windows 10 R8999.00	4005U 1.7GHZ_processor 4GB RAM 1TB Hard Drive SSD Windows 10 24x CDRW Drive 12-month warranty R8499.00

2.1   When analysing the adverts above, the term modular design was mentioned.

    2.1.1   Explain the term modular design.   (2)

    2.1.2   Give TWO (2) advantages of a modular designed PC.   (2)

2.2   Advert 1 comes with a DVDRW and Advert 2 with a CDRW.

    Differentiate between a DVDRW and CDRW.   (2)

2.3   The ex-students notice that Advert 1 has a HDD hard drive while Advert 2 has a SSD hard drive.

    Discuss the difference between the two hard drives.   (2)

2.4   One of the ex-students has come across the term malware.

    2.4.1   Name and explain THREE general classes of malware.   (6)

2.4.2　Name THREE ways in which you can reduce malware infection.　(3)

2.5　With the increase in load shedding, the ex-students are worried that the devices　(1)
will be damaged if they are not properly shut down.

Name one device that can be used to prevent the damage of these devices.

2.6　Human error often leads to data loss.

2.6.1　List TWO ways in which human error can lead data loss.　(2)

2.6.2　Explain THREE ways in which human error can be reduced.　(3)

2.7　The computers will be connected to the Internet.

State TWO precautions when online.　(2)

　　　　　　　　　　　　　　　　　　　　　　　　　　　Total =　25

Question 3 – Networks (communication technology)

3.1　The computers in the library will be networked. This network will form an integral part of
the library.
　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　(1)
Give a concise definition of a *computer network.*

3.2　A NIC is vital when connecting computers in a network.

3.2.1　Briefly explain the role performed by a NIC in terms of a network.　(1)

3.2.2　How does a NIC for wireless network differ from a NIC for a cabled network?　(2)

3.2.3　The ex-students notice that NIC for the PC's are advertised in 10Mbps/ 100Mbs and
1000Mbps.

Explain what these specifications refer to and why there seem to be three different
specifications for the same item.　(2)

3.3　The ex-students are worried that by implementing a cabled network, the cables lying
around may pose a safety problem.

Besides cabling suggest another way in which the PC's can be linked together?　(1)

3.4　A member of the ex-students society wants some clarity on WiFi and WiMAX

   3.4.1   What do WiFi and WiMax have in common?   (1)

   3.4.2   What are the main two differences between theses technologies?   (2)

3.5   All types of networks have a form of protocol.

   3.5.1   What is a network protocol?   (1)

   3.5.2   Explain what the following protocols are: SMPT, HTTP and VOIP.   (3)

   3.5.3   Differentiate between HTTP and HTTPS.   (2)

   3.5.4   Name the communications protocol used to transfer large files between computers via networks such as the Internet.   (1)

3.6   The ex-students have notice that most cell phones are classified as smartphones.

   3.6.1   Explain the difference between a smartphone and a normal cell phone.   (2)

   3.6.2   Name TWO types of operating systems used by smart phones.   (2)

3.7   The ex-students would like to set up the librarian's phone to receive and send emails.

   Differentiate between "Notifications" and "Push Technology".   (2)

3.8   What is Blogging and Microblogging?   (2)

                                           Total =   25

Question 4   Solution and application development

4.1   The ex-students did some research into the cost of the Intel "i-range" computers and found that they fell into one of three price categories according to the following table:

PRICE RANGE	PROCESSOR
R3000 - R5000	I3
R5001 - R8000	I5
R8001 - R12000	I7

   A programmer created a program in which a budget amount for a single machine can be entered and the program outputs the best processor that can be purchased for that amount. If the budget amount entered is below R3000 a message "you cannot afford an i-processor" is displayed.

   Write a **CASE STATEMENT** algorithm segment that would provide a solution to the above problem.   (5)

4.2   Network consultants will be hired to offer assistance to learners and staff who will use the centre. They will be paid at a rate of R100 per hour payable at the end of the week based on the total number of hours worked from Monday to Friday. The wage is worked out based on the following algorithm:


```
1   input the name of the consultant
2   Pay ← 0
3   Loop for each of the five days
4       Total ← 0
5       Number ← Input the number of hours  worked
6       Total ← Total + Number
7       Pay ← Number * 100
8   End loop
9   Display the name of the consultant, number of hours
    worked and the wage due
```

4.2.1   In line 5 the user is required to enter a number which is saved into the integer variable Number.

a)   The user enters the number -3 (negative three) when prompted to enter the number of hours worked.

What will the impact of this input be on the execution of the program based on this algorithm? Explain your answer.

(2)

b)   The user types in the phrase 'FIVE HOURS' when prompted to enter the number of hours worked.

What type of error (Syntax/Runtime) will occur?

(1)

4.2.2   When the program is executed and the user enters a valid number when prompted to enter the number of hours worked, the payments are calculated and displayed incorrectly. This is the result of TWO logical errors in the given algorithm.

a)   Explain, in general, what a logical error is.

(2)

b)   Explain how to correct EACH of the TWO logical errors in the given algorithm.

In your answer make use of the line numbers to refer to the statements in the algorithm.

(2)

4.3   Calculations based on computer specifications and salaries for employees were an essential part of budget discussion.

Arrays were suggested as a way of storing the data for manipulation programmatically.

In each of the following determine whether an array is necessary or not. Simply write the numbers 4.3.1 to 4.3.3 and **"Yes"** or **"No"** next to each.

4.3.1   A list of salaries is entered.
         The average salary is required.   (1)

4.3.2   A list of prices is entered.
         We need to know how many prices are above R8000.   (1)

4.3.3   A list of salaries is entered.
         We need the number of salaries that are above the average salary.   (1)

4.4   Consider the following GUI that captures a **test mark** and the **test total** from TWO TEdit boxes. The GUI has:

- a button **"Calculate"** which determines the percentage obtained in the test
- a button **"Clear"** which clears the entries in the edit boxes.
- A button **"Close"** which closes/exits the program
- A label to display the percentage determined in the **"Calculate"** button

Test Percentage Calculator

Enter test data

Test Mark

Test Total

Calculate   Clear   Close

4.4.1

TASK	OBJECT	EVENT

Use the GUI to complete the following TOE chart. Write down from **(a)** to **(f)** in your answer sheet and write down the relevant object or event. Where applicable you may create your own variable names for objects.

Input		
Get TestMark	(a)	none
Get TestTotal	edtTestTotal	(b)
Processing and Output		
Calculate the average for the test	(c)	Button click
Display the calculated average	lblOutput	(d)
Clear the input and output controls	(e)	(f)
Close the program	btnExit	Button click

(6)

4.5
```
Line 1   sum ← 0
     2   num ← input an integer
     3   loopCounter ← 1
     4   while loopCounter < num
     5   Begin loop
     6     if num mod loopCounter = 0
     7       then sum ← sum + loopCounter
     8   end  loop
     9   display sum
```

The above algorithm is designed to find the sum of all the even numbers up to an integer value entered by the user. There are two errors in the given algorithm. Rewrite the above algorithm correcting the errors.

Eg. If the value of num is entered as 10 then the output will be 30 obtained as follows 2+4+6+8+10.

(4)

Total = 25

QUESTION 5   INTEGRATED SCENARIO

The librarian has some computer knowledge but require answers to a few questions.

5.1   She knows that one of the essential functions of an operating system is process
       management.

       Explain what process management is in terms of the operating system.   (2)

5.2   Virtualisation is creating an entity that only exists in software.

       Give TWO examples of virtualisation software.   (2)

5.3   The library has received a sponsorship of separated video cards.

       5.3.1   Which expansion slot is a video card plugged into?   (1)

       5.3.2   Discuss the processing benefit a separate video card would have, besides
                producing better quality images (output) that are displayed on your monitor.
                                                                                    (2)

       *The librarian wants to use an electronic system to keep track of stock and the
       borrowing of books by learners. This will require that all the stock and learners
       details need to be captured into a database.*

5.4   Give TWO possible consequences of the library losing its data if the data was not
       backed up.   (2)

5.5   An electronic system is exposed to many threats.

       Explain how a worm can pose a threat to your data.   (2)

5.6   Explain the implications if your computer is infected by spyware.
                                                                    (2)

5.7   State TWO ways in which the librarian can make mistakes that will result in the loss of   (2)
       data.

5.8   List TWO ways in which hardware related issues can lead to a loss of data.   (2)

5.9   Explain the difference between a *full backup* and an *incremental backup*.   (2)

5.10   Data captured into a computer system need to be validated and verified.

       Differentiate between *data validation* and *data verification*.   (2)

5.11   When recording the details of books, two fields [the category (fiction, non-fiction) and
       the subject classification [English, Afrikaans, History, General Knowledge, ..] needs to
       be captured.
                                                                    (2)
       State TWO GUI components that can help reduce the need to type details.

5.12   Give TWO different types of checks that programmers should include in their programs
       when testing data entered by a user.   (2)

Total =   **25**

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GRADE 11

21 JUNE 2016

MEMORANDUM

QUESTION 1

1.1	C	✓✓
1.2	D	✓✓
1.3	C	✓✓
1.4	D	✓✓
1.5	C	✓✓
1.6	A	✓✓
1.7	C	✓✓
1.8	C	✓✓
1.9	B	✓✓
1.10	B	✓✓

QUESTION 2

2.1 When discussing the adverts, the term modular design was mentioned.

2.1.1 What is Modular design
When a computer is designed with separate components✓, which makes upgrading and maintenance easier✓. (2)

2.1.2 Give 2 advantages of a modular designed PC
When the user need to upgrade the PC it would easy as the parts are removable.✓
If components in the PC breaks or malfunctions it would be easy to replace✓
Any other acceptable answer. (2)

2.2 Advert 1 comes with a DVDRW and advert 2 a CDRW. What is the difference between them
A DVDRW can read/write both CD's and DVD's✓ while a CDRW can only read/write to CD's✓ (2)

2.3 The ex-students notice that advert1 has an HDD hard drive while advert 2 has an SSD hard drive. Discuss the difference between the two hard drives.
An HDD hard drive is mechanical, it has moving parts while an SSD has no moving parts and is electronic storage.✓
SSD storage is faster than HDD✓
SSD's are physically smaller than HDD's
SSD's usually have a smaller storage capacity than HDD's
(any 2) (2)

2.4 2.4.1 One of the ex-students has come across the term malware. Give 3 of the general classes of malware and explain each.
Virus✓ – malware that attaches itself to a file or executable program, enabling it to spread between computers.✓
Computer;worm✓ – malware that exploits weaknesses in an application or operating system in order to spread.✓
Trojan✓ – is a program that is disguised with useful or desirable features.✓
Others: spyware and rootkit (accept with explanation) (6)

2.4.2 Name 3ways in which you can reduce malware infection.
Use antivirus✓
Keep antivirus software up-to-date✓
Set firewall up for incoming and outgoing✓ (3)

2.5 With the increase in load shedding, the ex-students are worried that the devices will be damaged if they are not properly shut down. Name one (1)

device that can prevent the damage to these devices.
UPS (uninterrupted power supply)✓

2.6

2.6.1 Give two ways of how human error can lead to loss of data
Accidently deleting files, formatting flash drives, not making regular
backups, entering incorrect data in a program.
Any two acceptable answers✓✓ (2)

2.6.2 Explain 3 ways in which human error can be reduced.
Automate processes by scheduling updates.✓
Set string passwords✓
Implement access rights.✓
Any 3 suitable ways. (3)

2.7 The computers will be connected to the internet, state 2 precautions when
online
Any 2 suitable answers✓✓ (2)

[25]

<u>QUESTION 3</u>

3.1 Networks form an integral part of any network.
Give a concise definition of a *computer network*.
A network is a collection of computers or other computing devices (such as
smart phones) that are connected by some sort of communication media to
facilitate sharing of software and resources. ✓ (1)

3.2 A NIC is vital when connecting computers in a network.

3.2.1 Briefly explain the role performed by a NIC in terms of a network.
A NIC is used to encode/decode ('convert') the data so that the data can be
transmitted over a specific medium. ✓ (1)

3.2.2 How does a NIC for wireless network differ from a NIC for a cabled network?
A NIC in a wired or cabled network will need a port to connect to a cable. ✓
A NIC for a wireless network needs a small antenna that allows it to send and
receive data using radio signals.✓ (2)

3.2.3 The ex-students notice that NIC for the PC's are advertised in 10Mbps/
100Mbs and 1000Mbps.
Explain what these specifications refer to and why there seem to be three
different specifications for the same item.
The Mbps refer to speed ✓ and the reason there are different types of speed
is for the different types of cabling.✓ (2)

3.3 The ex-students are worried that by implementing a cabled network, the
cables lying around may pose a safety problem.
Besides cabling what other way can they link the PC's together? (1)
Wireless connections✓

3.4 A member of the ex-students society wants some clarity on WiFi and WiMAX.

3.4.1 What do WiFi and WiMax have in common? (1)
They both allow wireless devices to communicate with one another✓

3.4.2 What are the main two differences between these technologies?
WiMAX is an upgrade of WiFi technology and it allows wireless devices to (2)

communicate with one another over a wider area than WiFi. ✓
WiMAX is also more secure than WiFi.✓

3.5

3.5.1 All types of networks have some form of protocol.
What is a network protocol?
Set of rules for encoding and decoding data for transmission across a
network. ✓ (1)

3.5.2 Explain what the following protocols are: SMPT, HTTP and VOIP
SMPT: Protocol used for sending mail✓
HTTP: defines how web pages are transferred across the internet✓
VOIP: allows telephone calls over LANS, WANS and internet.✓ (3)

3.5.3 Differentiate between HTTP and HTTPS
Both are used to transfer text, images, video and other data for displaying as
a web page in a web browser.✓ HTTPS includes security and encryption to
protect the information communication process.✓ (2)

3.5.4 Name the communications protocol is used to transfer large files between
computers via networks such as the internet?
FTP (1)

3.6 The ex-students have notice that most cell phones are classified as
smartphones. Explain to them what is a smartphone compared to a normal
phone.
Smartphones are cell phones that include a mobile operating system
designed for a mobile device✓
Smartphones have the ability to install and run third-party software or
apps.✓ (2)

3.7 Smartphones allow for internet connectivity and web browsing.
Name two operating systems that smartphones use.
Android✓ iOS✓
Any 2 suitable answers (2)

3.8 The ex-students would like you set up email on the teachers phones as it
would be easier to communicate.
Differentiate between 'Notifications' and 'push technology'.
Notifications refers to an automated on screen message that informs you
when an email is received✓.
Push Technology is when the server notifies the device that a new message
has arrived and downloads it to the device.✓ (2)

3.9 What is Blogging and Microblogging?
Blogging is when websites are often updated✓ with news and events while
microblogging refers to posting short entries.✓ (2)

QUESTION 4

4.1)

1. Budget ← Enter budget amount ✓
2. Case (budget) of ✓
   - 0..2999   : output "you cannot afford an i-processor" ✓
   - 3000..5000 : output "i-3"
   - 5000..8001 : output "i-5" ✓
   - 8001..12000 : output "i-7" ✓
   - Else output "not applicable" ✓

(5)

4.2.1 (a)The algorithm will accept the data ✓ but in determining the pay will result in a negative wage ✓ which does not make sense. (2)

(b) Runtime ✓ (1)

4.2.2 (a) A logical error occurs when the program compiles successful without errors and also produces output without crashing ✓ , however does not produce the expected/desired result.✓ (2)

(b) Correction for error Line 4:

Move line 4 to any position above the starting point of the loop ✓. (2)

Correction for error Line 7:

Change line 7 to: Pay ✓ Pay + (Number * 100) ⊠

OR

Change line 7 to: Pay Total * 100

Move line 7 to outside the loop, between lines 8 and 9. (2)

4.3.1 No ✓
4.3.2 No ✓
4.3.3 Yes ✓
(3)

4.4.1(a) edtTestMark (or any suitable name) ✓
(b) none ✓
(c) btnCalcAverage (or any suitable name) ✓
(d) button.click ✓
(e) btnClear (or any suitable name) ✓
(f) button.click ✓
(6)

4.5
```
1  sum ← 0
2  num ← input an integer
3  loopCounter ← 1
4  while loopCounter <= ✓✓num
5  Begin loop
6  if num mod loopCounter = 0
7     then if loopCounter mod 2 = 0 ✓✓
          Then sum ← sum + loopCounter
8  loopCounter ← loopCounter + 1 ✓✓
9  end loop
10 display sum
```

Due to there being three errors allocate two marks for either line 7 or 8

Total = 25

QUESTION 5

5.1 Process management is the task of making sure that each process gets enough CPU time and access to memory, storage ✓ and other hardware so that it can work without interfering with, or being interfered with, by other processes. ✓ (2)

5.2 VirtualBox, Parallels, VM Player, etc. ✓ ✓ **(any 2)** (2)

5.3.1 It is plugged into a PCI-E expansion slot on the motherboard. ✓ (1)

5.3.2 Reduces the work load of the CPU, ✓ the computer responds faster when running graphics software like video editing or games. ✓ (2)

5.4 Time consuming/ costly to recapture data. ✓ Loss of stock may occur if no record of books borrowed. ✓ Library will not be functional until the system is working. **(Any 2 suitable responses)** (2)

5.5. A computer worm uses a weakness in an application or operating system to spread and can 'reproduce' itself within the network. ✓ Worms pose a threat to data in that they share your confidential files with others. ✓ (2)

5.6 Spyware such as keyloggers monitor your activities and collect personal information including passwords and account numbers ✓ and report them to other parties to either use this information directly or in order to gain access to your data. ✓

(2)

5.7 (Any TWO valid responses) ✓✓
- Accidentally deleting files or formatting a disk
- Not ensuring that regular backups take place
- Entering incorrect data in a program
- Losing or misplacing portable storage devices
- Allowing other unauthorised users to get access to data
- By not following basic security principles etc.

(2)

5.8 Power problems can result in loss of data
Hardware failure or damage can occur,
Theft of hardware.   (Any 2) ✓✓

(2)

5.9 A full backup is a copy of all your data or files. ✓
Incremental –the backup software only copies over new files and files that have been changed since the last backup. ✓

(2)

5.10 Verification refers to checking that data entered is correct or accurate –by checking against another source. ✓
Data validation is to check that the data entered makes sense –for grade, cannot enter a number over 12. ✓

(2)

5.11 Category – radio button ✓
Check boxes, list boxes and other components where a user makes their choice by 'clicking on' or selecting an item from a set of possible options.
(Any 2) ✓

(2)

5.12.   Data Type, Format, Range and Presence checks (Any 2) ✓✓

(2)

Total = 25