education

Department: Education

PROVINCE OF KWAZULU-NATAL

INFORMATION TECHNOLOGY

PAPER 2

JUNE EXAMINATION 2016

GRADE 10

MARKS: 100

TIME: 2 HOURS

This question paper consists of 10 pages including the cover page.

INSTRUCTIONS AND INFORMATION

1. This question paper consists of FIVE sections:

SECTION A:	Multiple-choice Questions	(10)
SECTION B:	System Technologies	(30)
SECTION C:	Social Implications	(15)
SECTION D:	Data and Information Management	(25)
SECTION E:	Solution Development	(20)

2. Answer ALL the questions.

3. Read ALL the questions carefully.

4. Start EACH question on a NEW page.

5. Leave a line after each answer.

6. The mark allocation generally gives an indication of the number of facts required in your answer.

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

8. Write neatly and legibly.

Please turn over

SECTION A : MULTIPLE CHOICE QUESTIONS

QUESTION 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 (1.1–1.10) in the ANSWER BOOK.

1.1   Which one of the following is NOT an example of an operating system?

A   Windows
B   Linux
C   Microsoft Office
D   Android

1.2   Types of computers sorted according to highest processing power to lowest processing power.

A   Server, laptop, tablet, Smartphone
B   Notebook, laptop, tablet, desktop
C   Desktop, server, laptop, smartphone
D   Smartphone, tablet, laptop, server

1.3   Which of the following is NOT an advantage of using computers?

A   Are fast and accurate.
B   Quickly becomes out-dated.
C   Are multi-purpose.
D   Performs repetitive tasks

1.4   A device that is considered to be both an Input device AND Output device.

A   Touchpad
B   Projector
C   Touch Screen
D   Game controller

1.5   A file extension for a video file is ...

A   docx
B   gif
C   mp3
D   mp4

1.6   A control that allows the user space to enter information

A   Spinner
B   Edit box
C   Label
D   Button

1.7   Allows you to connect to the Internet using the cellular telephone network.

A   ADSL modem
B   Dial-up
C   3G modem

Please turn over

D   Switch

1.8   The contrast ratio is

     A   The ratio between the colour in a colour printer
     B   The ratio of the darkest black and the brightest white the monitor can produce.
     C   The ratio of an image
     D   The measurement of the size of the screen to the size of the laptop.

1.9   Used to navigate between folders you have already opened.

     A   Toolbar
     B   Search Box
     C   Address bar
     D   Back and Forward buttons

1.10 The hexadecimal number $2F3_{16}$ is equivalent to

     A 755_{10}
     B 752_{10}
     C 752_{2}
     D 307_{10}

Total for Section A: **10**

SECTION B : SYSTEMS TECHNOLOGY

> **Scenario**
>
> Ichigo Secondary School has encountered a lot of break-ins during the course of this year. One of the major rooms that the break-ins occurred recently was the computer room. Due to this break-in, the local municipality has decided to do an audit so that they can see how best to help the school.

QUESTION 2

The learners were interviewed about what had been stolen from the computer room and they came up with the following list:

Quantity	Item
50 GB	RAM
5	CRT Monitor
12	LCD Monitor
3	Towers
1	3-in-1 Laser Printer
1	Data Projector

2.1   The towers that were stolen have a number of components inside it and the individuals that are doing the audit need some clarity on certain components.

    2.1.1   What is the *motherboard*? (1)

    2.1.2   Besides the motherboard there is another very important component in the computer called the CPU.

        a) Explain the purpose of the CPU. (1)

        b) Name ONE manufacturer of a CPU. (1)

        c) Why does the CPU need a cooling fan? (1)

    2.1.3   RAM plays a very important role in a computing device.

        a) How does RAM assist the CPU? (1)

        b) The audit team is considering getting computers with bigger RAM.

           Is this a good idea? Motivate your answer by making reference to what happens when RAM is increased. (2)

        c) Name TWO disadvantages of RAM. (2)

2.2   Motivate TWO reasons why the CRT monitors should be replaced by LCD Monitors. (2)

2.3   Explain to the auditors why having a data projector is necessary in the classroom. (1)

2.4   The school principal has purchased a new printer for the room.

2.4.1   Explain what "3-in-1" means in reference to printers. (1)

2.4.2   Briefly explain how a laser printer works? (1)

2.4.3   Name ONE other printer you have studied. (1)

2.4.4   The new printer is not working with the existing computers. An error message: **"driver not found"** is displayed. The principal does not understand what this means.

        a) State the purpose of a device driver. (1)

        b) Explain to the principal how this problem can be solved. (1)

2.5   Besides having hardware issues in the school, software is also a concern, especially now that computers are needed for the mid-year examinations.

One of the most important software that is needed is an operating system.

2.5.1   What is an operating system? (1)

2.5.2   Name TWO roles of the operating system. (2)

2.5.3   Explain how an embedded operating system differs from a standalone operating system. (2)

2.6   The school is going to invest in new computers. The IT learners have requested that the principal considers computers that have a good amount of memory and storage.

2.6.1   Differentiate between *memory* and *storage*. (2)

2.6.2   List TWO advantages of using a flash drive. (2)

2.7   The principal has recently bought a 2.5" driver portable hard drive.

2.7.1   Name the port that the above mentioned device can be plugged into. (1)

2.7.2   List TWO advantages of using a 2.5" drivers portable hard drive? (2)

2.8   What is the main reason for *synchronising* your phone and your computer? (1)

Total for Section B: **30**

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SECTION C : SOCIAL IMPLICATIONS

QUESTION 3

3.1   Due to the lack of computer equipment and budgetary constraints in the school, there has been many software issues that have been dealt with incorrectly.

    3.1.1   Every software that one installs on a computer has a EULA.

        a) What does the abbreviation EULA stand for?   (1)

        b) Explain what *EULA* is.   (2)

    3.1.2   The principal of the school has heard of copyright and copyleft but does not know what they are.

    Explain the difference between *copyright* and *copyleft* to him.   (2)

    3.1.3   The principal has been buying one license for certain software and installing it on multiple computers. It was brought to his attention that he is committing piracy.

        a) Explain the term *piracy*.   (1)

        b) List TWO other ways in which one can commit piracy.   (2)

3.2   Explain the term *digital divide*.   (1)

3.3   Ichigo Secondary is considered to be a green school because of their love for the environment and their practice of green computing.

    3.3.1   List TWO tips on how to practice green computing.   (2)

    3.3.2   Define the term *ergonomics*.   (1)

    3.3.3   Name THREE health practices that one can engage in when using computers.   (3)

Total for Section C: **15**

SECTION D: DATA AND INFORMATION MANAGEMENT

QUESTION 4

4.1   Data plays a very important role when it comes to computing.

      4.1.1   Differentiate between *data* and *information*.   (2)

      4.1.2   One way of storing data is using a variable that can hold a value of a specific data type.

            a)   How many binary digits does a byte consist of?   (1)

            b)   Name TWO types of primitive data types.   (2)

            c)   Name and explain the TWO categories that results in unreliable data, which are caused by trying to allocate data that cannot fit into that variable.   (4)

4.2   One of the ways in which you can search for a document is by remembering its path. An example of a path is

$$D:\backslash Documents \backslash SchoolFees \backslash 2016 \backslash 10A.xlsx$$

Using the path above answer the questions that follow:

      4.2.1   Name the drive.   (1)

      4.2.2   Name ONE folder.   (1)

      4.2.3   The name of the file is **10A**.

            a)   What file type is 10A considered to be? Explain how you came to that conclusion.   (2)

            b)   A file type should be saved in a format that can be read by more than one type of programs.

               Name TWO advantages of saving a file in a format that can be read by other types of programs.   (2)

4.3   Number systems play a very important role in computing. Convert the following accordingly.

      4.3.1 10011101_2 to   decimal.   (3)

      4.3.2 101.101_2 to   base 10.   (3)

      4.3.3 6532_{10} to   binary.   (4)

                                   Total for Section D: 25

SECTION E : SOLUTION DEVELOPMENT

QUESTION 5

5.1   Line
        1. Input num
        2. count ← 0
        3. repeat num
        4.   if num mod count = 0
        5.   sum ← sum + num
        6. change count by 1
        7. Display sum

The above pseudo code is an incorrect pseudo code calculating the sum of all the factors of a number that was input by the user. Using the pseudo code, answer the questions that follow.

5.1.1 Name ONE variable.   (1)

5.1.2 What is the function *mod* used for?   (1)

5.1.3 Is the loop in the pseudo code above a *conditional* or *unconditional* loop?
       Justify your answer.   (2)

5.1.4 There are currently TWO errors in the pseudo code.

       Identify the line numbers and explain these TWO errors.   (4)

5.2 The principal of the school has decided to create a password for each of the 20 teachers in the school. He has asked for your assistance, as a programmer, to write the pseudo code that will generate these passwords for each teacher.

The principal will enter the names, date of birth (yyyy/mm/dd) and contact number for each teacher. The password that you generate must be stored in a list called **passwordList**.

The password is generated as follows:
- First 2 letters of the teachers name followed by,
- The age of the teacher (use 2016 as the current year), then
- the '@' and finally
- a random number between 5 and 10

Sample Input

Name: Ashlin
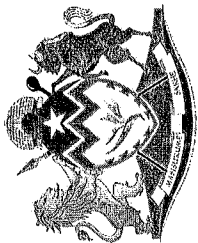Date of Birth: 1990/16/12
Random Number: 6

Sample of code

Code: As26@6

(12)

Total for Section E: 20
GRAND TOTAL: 100

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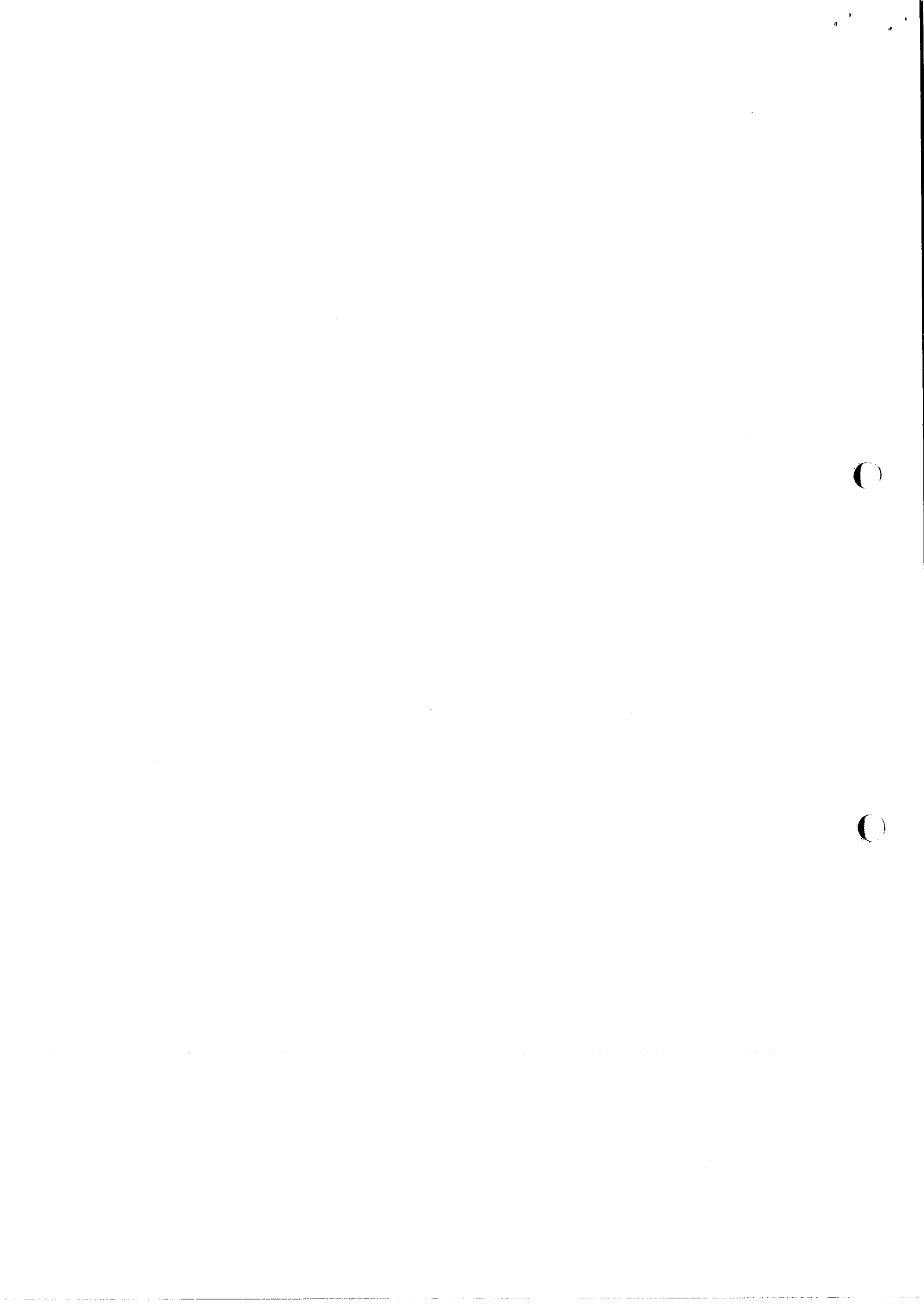PAPER 2 – MEMORANDUM

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SECTION A : MULTIPLE CHOICE QUESTIONS

QUESTION 1

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

SECTION B : SYSTEMS TECHNOLOGY

QUESTION 2

2.1

2.1.1   It is a large piece of circuitry with slots and connectors for different components and peripherals to connect to it. ✓ **(1)**

2.1.2

a) It is the part of the computer that does all the work or processing. ✓ **(1)**

b) Intel OR AMD ✓ **(1)**

c) The CPU gets very hot when the computer is on and overheating can damage the CPU therefore it needs a cooling fan. ✓ **(1)**

2.1.3

a) It helps with the fast transfer of data so that the CPU can process the data and information. ✓ **(1)**

b) Yes ✓
Increasing RAM will result in increasing the speed of the computer. ✓

(Do not give marks for Answer only, must have a correct reason supporting their answer)

c) RAM is
- Volatile ✓
- Expensive ✓   (any other relevant answer) **(2)**

2.2
- It is smaller
- Lighter
- More energy efficient
- Cheaper to replace
- Aesthetically pleasing to look at

✓✓   (Any 2 advantages from above) **(2)**

2.3   Due to the classes being so big it is the best way to project images on a big screen so that everyone in the class can see and get the information. ✓ **(1)**

2.4.1   Printer is an example of a MFD(Multi-function device) which has the ability of doing 3 functions; Scanning, copying and Printing. ✓ **(1)**

2.4.2   It melts toner onto paper in order to print an image. ✓ **(1)**

2.4.3   Inkjet or dot-matrix ✓ **(1)**

2.4.4   a) Device drivers are essential pieces of software that allows an operating system to communicate with and control a hardware device. ✓ **(1)**

b)
- download the drives from the Internet
- reload the driver that came with the printer
- go to a computer shop and purchase the software.

✓ (ONE of the above response) **(1)**

2.5

2.5.1   It is system software which controls all activities that take place in a computer. ✓ **(1)**
(No marks will be allocated for giving examples only)

2.5.2
- Provides an interface
- Process and task management
- Memory management
- Input/output management
- Disk management

✓✓ (TWO of the above 5 response) **(2)**

2.5.3   Embedded operating systems differ in that they are stored on internal memory ✓ chips so they are not loaded from disk as in a standalone operating system. ✓ **(2)**

2.6

2.6.1   Memory is a where the computer stores data temporarily ✓ whereas storage is more permanent. ✓ **(2)**

2.6.2
- Electronic rather than mechanical
- Much faster than optical or magnetic storage
- Less likely to get damaged as compared to hard drives
- Smaller and lighter to carry around. (portable)

✓✓ (ANY TWO relevant answers) **(2)**

2.7

2.7.1   USB **OR** Firewire **OR** Thunderbolt ✓ **(1)**

2.7.2
- Need less power ✓
- Can run on the power that is supplied by the cable. ✓ **(2)**

(Accept any other variations.)

2.8   To allow current, relevant and up-to-date data to be accessible on more than one computing device so that one is able to use it anywhere. ✓ **(1)**

Total for Section B: 30

3.1

3.1.1

a) End User License Agreement ✓ (1)

b) It is a license that you purchase to use software ✓ to install on only one computer / device only ✓ (2)

3.1.2 Copyright is designed to protect intellectual property from distribution ✓ whereas Copyleft allows people to use and distribute work whilst still allowing the creator some control. ✓ (2)

3.1.3

a) Is the act of stealing intellectual property – illegal distribution and use✓ (1)

b)
- Installing and using software that is not free without paying for it
- Sharing software with friends/family when not permitted to do so
- Selling illegal copies of media or software
- Large scale copying and selling of illegal counterfeit copies of media

✓✓ *(ANY TWO relevant response)* (2)

3.2 The gap between people that have access to computers and technology and know how to use it and people that don't. ✓ (1)

3.3

3.3.1
- Switch off computers and devices you are not using
- Try and avoid senseless wasting of paper – edit/correct work on screen before printing
- Repair or upgrade hardware
- Don't throw away ink and toner cartridges.
- Refilling and reusing ink and toner cartridges

✓✓ *(Any TWO from above)* (2)

3.3.2 The study and design of workplace for comfort and safety of people in work environments. ✓ (1)

3.3.3
- Sit correctly
- Make sure lighting and ventilation is adequate
- Your mouse and keyboard must be on the same level
- Take regular breaks
- The monitor should be positioned at the correct level so you don't strain your neck.

✓✓✓ *(any THREE relevant response)* (3)

Total for Section C: 15

4.1

4.1.1 Data is raw unprocessed facts ✓ whereas information is the result of the processing of data and is useful and meaningful. ✓ (2)

4.1.2

a) 8 ✓ (1)

b) Integer or whole number
Real or decimal or floating point
String or text

✓✓ *(any TWO from above)* (2)

c) Truncation and Overflow ✓ - when some text is lost or truncated and where there is a misinterpretation of bytes. ✓

Loss of accuracy ✓ - does not give the accurate information ✓ (4)

4.2

4.2.1 D drive ✓ (1)

4.2.2 Documents OR SchoolFees OR 2016 ✓ (1)

4.2.3

a) Spreadsheet ✓
It has a file extension "xlsx" which means it was created and can be opened in Microsoft Excel. ✓ (2)

b)
- Share data by using a common format that both programs can read and interpret
- Allows users who are using a different operating system to access the data
- Allow users who are using older versions of a program to access the data

✓✓ *(any TWO from above)* (2)

4.3

4.3.1
$$= ((1\times2^7)+(0\times2^6)+(0\times2^5)+(1\times2^4)+(1\times2^3)+(1\times2^2)+(0\times2^1)+(1\times2^0)\ \checkmark$$
$$=128 + 0 + 0 + 16 + 8 + 4 + 0 + 1\ \checkmark$$
$$= 157_{10}\ \checkmark$$
(3)

4.3.2
$$= (1 \times 2^2) + (0 \times 2^1) + (1 \times 2^0) + (1 \times 2^{-1}) + (0 \times 2^{-2}) + (1 \times 2^{-3})\ \checkmark$$
$$= 4 + 0 + 1 + \tfrac{1}{2} + \tfrac{1}{4} + \tfrac{1}{8}\ \checkmark$$
$$= 5.875_{10}\ \checkmark$$
(3)

4.3.3

B	6532	R

(3)

2	3266	0
2	1633	0
2	816	1
2	408	0
2	204	0
2	102	0
2	51	0
2	25	1
2	12	1
2	6	0
2	3	0
2	1	1
2	0	1

= 110011000100100$_2$ ✓

SECTION E : SOLUTION DEVELOPMENT

QUESTION 5

5.1

5.1.1   num
         count
         sum

     ✓ ONE from above   (1)

5.1.2   It is used to determine the remainder after one number has been divided by another. ✓   (1)

5.1.3   Unconditional ✓
     We know how many times the loop must run so there is no condition. ✓   (2)

5.1.4   Line 1 count ← 0 ✓
       the count should be set to 1 because you cannot divide by 0 ✓

     Line 5 sum ← sum + num ✓
       need to add sum to count not the number. ✓   (4)

Total for Section D: (4)   25

5.2 Start

1. repeat 20 ✓
2. Input name
3. Input dob
4. Input contact
5. first ← letter 1 of name + letter 2 of name ✓✓
6. year ← letter 1 of dob + letter 2 of dob + letter 3 of dob + letter 4 of dob ✓✓✓
7. age ← 2016 – year ✓
8. random ← pick random from 5 to 10 ✓
9. code ← first + age + '@' + random ✓✓
10. add code to passswordList ✓

Stop

<p style="text-align:center"><u>OR</u></p>

Start

1. repeat 20 ✓
2. Input name
3. Input dob
4. Input contact
5. first ← letter 1 of name + letter 2 of name ✓✓
6. c ← 1
7. repeat 4 ✓
8.   year ← join letter c of dob to year ✓
    change c by 1 ✓
9. age ← 2016 – year ✓
10. random ← pick random from 5 to 10 ✓
11. code ← first + age + '@' + random ✓✓
12. add code to passswordList ✓

Stop

(12)

Total for Section E: 20

GRAND TOTAL: 100