**MEMORANDUM**

# **INFORMATION TECHNOLOGY P2**

# **NOVEMBER 2016**

# **UMLAZI DISTRICT/CLUSTER PAPER**

# NATIONAL

# SENIOR CERTIFICATE

# **GRADE 10**

MARKS: 150 Examiner: L. Roopnundh/P.Rampersad

# TIME: 2 hours Moderator: P.Rampersad/ L. Roopnundh

**This question paper consists of 13 pages**

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| **SECTION A**  **QUESTION 1: MULTIPLE CHOICE** | | |
| 1.1 | C✔ |  |
| 1.2 | C✔ |  |
| 1.3 | A✔ |  |
| 1.4 | C✔ |  |
| 1.5 | C✔ |  |
| 1.6 | B✔ |  |
| 1.7 | D✔ |  |
| 1.8 | B✔ |  |
| 1.9 | B✔ |  |
| 1.10 | D✔ | **[10]** |

**QUESTION 2 – MATCHING**

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| **QUESTION 3: TRUE/FALSE** | | |
| (The statements are corrected where applicable) | | |
| 3.1 | **HTTPS** means a secured website – True**✔** |  |
| 3.2 | A **inkjet printer✔** works by spraying drops of ink onto the paper - False |  |
| 3.3 | In **Scratch programming** a list may contain values of different data types.- True**✔** |  |
| 3.4 | **Information** **✔**is meaningful and used to make decisions to situations.- False |  |
| 3.5 | A **mouse** is an example of an input device. - True**✔** | **[5]** |

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| **SECTION B**  **SCENARIO**:  The MTN South Africa Foundation handed out several computer labs to schools to promote ICT. The equipment included a server, three notebooks, a multifunction printer, 24 tablets, one data projector, security systems, an interactive whiteboard, and a modem that supports Wi-Fi and can also serve as a switch, as well as 3G/4G connectivity. | |  |
| **QUESTION 4: SYSTEM TECHNOLOGIES** | |  |
| 4.1.1 | Ubuntu**✔** | (1) |
| 4.1.2 | State TWO advantages of using open source software. (Any TWO) **✔✔**   - No cost / low cost (usually free).  - Access to source code.  - Freedom to adapt and change the software to suit your own needs.  - Access to a community of users / support. | (2) |
| 4.1.3 | Intel**✔** | (1) |
| 4.1.4 | Briefly describe the role of the CPU in a computer. (Any TWO)  The processor or Central Processing Unit (CPU) is the part of the computer that executes the instructions (the software) **✔**, processes the data **✔**and manages and controls all the other parts of the computer**✔**. | (2) |
| 4.1.5 | What is the typical role of a server?  Servers are used to supply services to connected computers**✔** and users on the network. **✔** | (2) |
| 4.1.6 | 1. Name TWO examples of consumer tablets. (Any TWO) **✔✔**  iPad, Galaxy Tab, Playbook, Xoom and HPTouchpad. 2. Briefly describe what consumer tablets are typically used for.  They are designed to be controlled through touch screen interfaces **✔**and are mainly used as e-book readers and for browsing the Net. **✔** | (2)  (2) |
| 4.1.7 | The acronym ICT stands for Information Communication Technology. Briefly describe what each of these terms refer to.  Information:Manipulated or processed data**✔** Communication:The process of transferring data/information from one place to another**✔** Technology:Systems technologies (hardware and software), **✔** May also refer to Communications technologies (networks and communication devices),  Internet technologies (Internet, World Wide Web and e-communication) | (3) |
| 4.1.8 | Explain what interactive whiteboards are and state why they are used in rooms where teaching takes place.   An interactive whiteboard is a large interactive board which uses a data projector linked to a computer to display the screen on the whiteboard. **✔** The whole setup works like a giant touch screen device. **✔** They are ideal for teachers to present content from electronic sources that they have created themselves, and from the Internet. **✔** | (3) |
| 4.1.9 | State TWO benefits of purchasing and using a multi-function printer.  They occupy less space**✔** and can be cheaper than purchasing separate equipment for each function. **✔** | (2) |
|  |  | **[20]** |

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| **QUESTION 5: COMMUNICATION AND NETWORK TECHNOLOGIES-NETWORKS** | | |  |
| 5.1 | | The devices in the donated computer lab are connected together to form a LAN as well as a WLAN. The server is connected to the Wi-Fi modem with a UTP cable. The notebooks, printer and tablets are setup to connect to the Wi-Fi modem wirelessly. |  |
| 5.1.1 | | What do each of the following acronyms represent?   1. LAN Local Area Network**✔** 2. WLAN Wireless Local Area Network**✔** | (1) (1) |
| 5.1.2 | | What do you think is the main benefit of implementing a WLAN?  It is convenient, as no cables**✔** need to be installed. It also allows a great deal of mobility**✔** and portability. **✔** | (3) |
| 5.1.3 | | What is the main function of a switch in a network?  It is a hardware device used to connect computers on a network so that communication can occur. **✔** | (1) |
| 5.1.4 | | Briefly discuss THREE reasons for having a network. (Any THREE) **✔✔✔**  - Fast, efficient communication - Sharing of hardware resources - Centralization of data - Transfer of files - Leisure - Increased control and security - Flexible access | (3) |
| 5.1.5 | | Three main roles are associated with computers in a network. These roles are client, server and peer.   1. State TWO advantages of a client/server network (Any TWO) **✔✔**  - The rest of the computers in the network do not have to have a large disk   capacity, and can have less powerful processors. - Faster performance. - Security is far more sophisticated 2. State TWO advantages of a peer to peer network. (Any TWO) **✔✔**  - No server is necessary. - Software is cheaper, as it is often built into many operating systems, for   example, Windows 10. - Can be installed by a person with reasonably low technical skills. - Since there is no server, the machines can run as stand-alone should a   network fault occur. - Does not need a dedicated network administrator. | (2)       (2) |
| 5.1.6 | | State TWO ways in which a user of a computer can determine if ones computer is connected to a network. (Any TWO) **✔✔**  - Presence of extra (logical) drives, such as U, V and T, etc.  - Presence of other computers in My Network Places. - Presence of network cabling. - Access to devices such as printers not directly attached to the computer. - Indicator showing network activity in the system tray etc. | (2) |
| 5.1.7 | | There are several drawback to using UTP cabling in a network. Explain what each of the following is and state how each affects data communication.   1. Attenuation – Refers to loss of signal strength over distance. **✔** The length of the cable affects the amount of attenuation**✔** 2. Eavesdropping – Since a cable is susceptible to EMI, it becomes possible for someone to detect a signal on the cable without piercing the cable**✔** and can gain access to the data**✔** 3. Crosstalk – The magnetic fields in two wires that are close to one another can interfere with transmission and create crosstalk. **✔** This can result in loss or corruption of data. **✔** | (6) |
| 5.1.8 | | Briefly explain what network security is.  Refers to policies put in place to ensure the security of a network**✔** by preventing unauthorised access and misuse of the computer network**✔** | (2) |
|  | |  | **[23]** |
| **QUESTION 6: COMMUNICATION AND NETWORK TECHNOLOGIES-** **INTERNET & WWW** | | |  |
| 6.1 | | It is expected that both teachers and learners will use the donated computer lab to find resources for effective teaching and learning on the Internet. Basic skills on the use of the Internet would be of great advantage. |  |
| 6.1.1 | | The Internet is a worldwide computer network. How is each computer that is connected to this network identified?  Every computer that is connected to the Internet or in a network must have its own unique Internet Protocol (IP) address. **✔** An IP address consists of 4 sets of digits separated by dots. A typical IP address looks something like: 192.168.103.150. | (1) |
| 6.1.2 | | Briefly explain what an ISP is and give ONE example of an ISP.   ISP – Internet Service Provider. An ISP is a company that has a permanent, fast connection to the Internet. This company sells Internet access to individuals or organisations at a monthly cost. **✔** The monthly cost depends on the type of access that the user chooses. (ANY example) **✔** Examples of South African ISPs: MWEB, TelkomSA, MTN and Internet Solutions | (2) |
| 6.1.3 | | Briefly explain the difference between WWW and the Internet.  The World Wide Web (also called the Web or W3) is actually one of the services that runs on the Internet. **✔**The Internet, also called the Net, is a worldwide computer network, consisting of computers and networks that are linked using telephone lines, undersea cables, satellite or microwave for the purpose of communication**✔** and sharing resources. | (2) |
| 6.1.4 | | Some URL’s begin with the prefix ftp:// instead of HTTP. What is the fttp protocol used for?  File Transfer Protocol is the protocol that can be used to transfer files quickly and easily between two computers that are connected to the Internet. **✔** The file gets uploaded to the FTP server and gets downloaded from a FTP server. **✔** | (2) |
| 6.1.5 | | Briefly explain the following concepts:   1. RSS feed  uses a family of standard web feed formats to publish frequently updated information: blog entries, news headlines, audio, video. **✔** One way to receive these feeds is to click on the RSS logo on a website with such a feed. This will subscribe you to the feed and will be added to the RSS tab of your web browser. You can check regularly to see if new information is available, and read the full article by clicking a link in the feed. 2. 3G  Is a recent generation of mobile (cellular) phone technology**✔** 3. Bandwidth  Data transfer rate, refers to the total amount of data that can be carried from one point to another in a given time period**✔** 4. Hyperlink  A built-in connection to another related web page, and is indicated as text underlined in blue, or by a graphic with a blue outline **✔** 5. Search engine  A program that is used to search for documents located on the Internet by using keywords or phrases entered by the user when looking for information**✔** | (5) |
|  | |  | **[12]** |
| **QUESTION 7:** **DATA AND INFORMATION MANAGEMENT - NUMBER CONVERSIONS / THEORY** | | |  |
| 7.1 | | Truncation, overflow and loss of accuracy are types of errors that take place that prevent accurate representation of data. Briefly explain each of these types of errors by referring to suitable examples.  (Accept any valid explanation) **Truncation and overflow**  Imagine we had a text or string variable that could store a maximum of 5 characters and we assigned the value ‘Addendum’ to the variable.   |  |  |  |  |  | | --- | --- | --- | --- | --- | | A | d | d | e | n |   In this case some of the text will be ‘lost’ or **‘truncated’**. **✔✔**When an integer number is ‘misrepresented’ due to an insufficient number of bytes being available, wê refer to it as overflow. **✔✔**  **Loss of accuracy**  Decimal or real numbers are normally stored in two parts, namely a ‘number’ part and an ‘exponent’ part.  3.1415462973812 x 1012  If there wasn’t enough bytes to store the ‘number’ part, certain numbers would get left out, which would mean that the decimal part of the number would be ‘rounded off’, and not entirely accurate. For example, a number such as 1.33250876 could be stored as 1.3325. **✔✔** | (6) |
| 7.2 | | Computers work with binary and hexadecimal number systems. Perform the following calculations and show all working. |  |
| 7.2.1 | | |  |  |  | | --- | --- | --- | | 2 | 352 | **✔✔✔** | | 2 | 176 | Rem 0 | | 2 | 88 | Rem 0 | | 2 | 44 | Rem 0 | | 2 | 22 | Rem 0 | | 2 | 11 | Rem 0 | | 2 | 5 | Rem 1 | | 2 | 2 | Rem 1 | | 2 | 1 | Rem 0 | | 2 | 0 | Rem 1 |   Convert the decimal number 35210 to binary.                     35210 = 1011000002 | (3) |
| 7.2.2 | | Convert the binary number 10110112  to decimal.  10110112 = 1 \* 26 + 0 \* 25 + 1 \* 24 + 1 \* 23 + 0 \* 22 + 1 \* 21 +1 \* 20 **✔✔**  = 64 + 0 + 16 + 8 + 0 + 2 + 1 **✔**   = 91 | (3) |
| 7.2.3 | | Convert the hexadecimal number 6DB16 to decimal  6DB16 = 6 \*162 + 13\*161 +11\*160**✔✔**  =1536 + 208 + 11**✔**  =1755 | (3) |
|  | |  | **[15]** |
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| **QUESTION 8:** **SOLUTION DEVELOPMENT** | | |  |
| 8.1 | Study the flowchart below and answer the questions that follow: | |  |
| |  | | --- | | Begin  1  Num 🡨 0  Value 🡨 100    2  Read X        3 F  X > 0        T    X < 100  4 5  Num 🡨 Num + 1  4  F  T  6  Value 🡨 Value - X        T 7  Value > 0      F  8  Print Num; Value    End | | | | |

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| 8.1.1 | Give the number of the box, from the flowchart, that is responsible for:   1. Controlling the loop - 7**✔** 2. Checking if the input value is positive or not - 3**✔** 3. Performing the initialisations - 1**✔** 4. Performing the increment of a counter variable - 5**✔** | (1) (1) (1) (1) |
| 8.1.2 | Assume that the following numbers were input in box 2 of the flowchart:  **15 ; 102 ; 12 ; 246 ; -10 ; 17 ; 16 ; 58**  Use the following headings, as well as the input values above, to construct and complete a trace table for the flowchart   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **Box no** | **Num** | **Value** | **X** | **X > 0** | **X < 100** | **Value > 0** | **Output** | |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | Box | Num | Value | X | X>0 | X<100 | Value>0 | Output | | 1 | 0 | 100 |  |  |  |  |  | | 2 |  |  | 15 |  |  |  |  | | 3 |  |  |  | T |  |  |  | | 4 |  |  |  |  | T |  |  | | 6 |  | 85 |  |  |  |  |  | | 7 |  |  |  |  |  | T |  | | 2 |  |  | 102 |  |  |  |  | | 3 |  |  |  | T |  |  |  | | 4 |  |  |  |  | F |  |  | | 5 | 1 |  |  |  |  |  |  | | 7 |  |  |  |  |  | T |  | | 2 |  |  | 12 |  |  |  |  | | 3 |  |  |  | T | T |  |  | | 6 |  | 73 |  |  |  |  |  | | 7 |  |  |  |  |  | T |  | | 2 |  |  | 246 |  |  |  |  | | 3 |  |  |  | T |  |  |  | | 4 |  |  |  |  | F |  |  | | 5 | 2 |  |  |  |  |  |  | | 7 |  |  |  |  |  | T |  | | 2 |  |  | -10 |  |  |  |  | | 3 |  |  |  | F |  |  |  | | 7 |  |  |  |  |  | T |  | | 2 |  |  | 17 |  |  |  |  | | 3 |  |  |  | T |  |  |  | | 4 |  |  |  |  | T |  |  | | 6 |  | 56 |  |  |  |  |  | | 7 |  |  |  |  |  | T |  | | 2 |  |  | 16 |  |  |  |  | | 3 |  |  |  | T |  |  |  | | 4 |  |  |  |  | T |  |  | | 6 |  | 40 |  |  |  | T |  | | 2 |  |  | 58 |  |  |  |  | | 3 |  |  |  | T |  |  |  | | 4 |  |  |  |  | T |  |  | | 6 |  | -18 |  |  |  |  |  | | 7 |  |  |  |  |  | F |  | | 8 |  |  |  |  |  |  | 2,-18 | |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  | |  | **✔** | **✔** | **✔✔** | **✔✔** | **✔✔** | **✔✔** |  | | (8) |
| 8.1.3 | Give the final output(s) that will be produced by the flowchart. 2, -18 **✔** | (1) |
| 8.1.4 | Which of the following alternatives accurately describes the function of the counter variable in the flowchart? (Write A, B, C or D) - D**✔**  A: The counter is responsible for determining the number of positive  numbers  B: The counter is responsible for determining the number of two digit  numbers input  C: The counter is responsible for determining the number of three digit  numbers input  D: The counter is responsible for determining the number of input values  that are greater than 99 | (1) |
| 8.1.5 | What will be the effect on the flowchart if all the numbers input were negative?  There would be an infinite loop**✔** | (1) |
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| 8.1.6 | The following Scratch program represents the complete flowchart: |  |
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| 8.6.1.1 | Rewrite ONLY the corresponding if statements, including the nested if statement, in Delphi. Assume that all the variables are declared correctly.   If (X>0) then**✔**  begin  if (X<100) then**✔**  **begin**  value := value – X**✔**  else  num := num + 1; **✔  end; ✔(correct begin end)**  end; | (5) |
|  |  | **[20]** |

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| **QUESTION 9:** **INTEGRATED QUESTION - SOCIAL, ETHICAL, LEGAL ISSUES, GREEN COMPUTING, HEALTH ISSUES, EMAIL, SAFE INTERNET USE** | | | [ |
| Educators and learners need to be aware of legal issues relating to the use of computers and software. In addition computer users must be aware of the effect of computers on one’s health and the environment. There is also a need to be aware of the threats associated with the use of the Internet and emails. | | | |
| 9.1 | | A learner at school asks a computer teacher if she could borrow a copy of Microsoft Office to install the software on her desktop at home.   1. Explain why copying software like Microsoft Office is illegal by making reference to the concepts of *intellectual property* and *copyright*.   Intellectual property is anything created by the mind. **✔** Copyright law protects intellectual property by creating legal limits on who can copy, sell and use this type of work. **✔** 2. Why is it that the illegal copying of software seems to be more acceptable in some countries than in others.  Different countries can have different copyright laws and the level of policing and detection of these practices might be a lower priority in some countries. Some countries are also better equipped in terms of law enforcement agencies to stamp out these practices. **✔** | (2)         (1) |
| 9.2 | | When installing freeware that is downloaded reference to the agreement to install mentions the terms *copyleft licence* and *Creative commons*. Briefly explain what is meant by:   1. Copyleft Copyleft-style copyright licenses that allow you to use parts of, copy and distribute work for non-profit purposes. **✔** 2. Creative Commons   Creative Commons is a non-profit organisation who have implemented more flexible licenses for the creators of content to control how their intellectual property is licensed and shared. **✔✔** | (1)     (2) |
| 9.3 | | Expand the acronym EULA and briefly explain what it is.   End User License Agreement**✔** EULA is a licence agreement between the software company and the user, specifying the conditions under which the user can install and use the software. **✔** | (2) |
| 9.4 | | Keyboards and mouses may be described as ergonomically designed to reduce RSI and CTS. Briefly explain the terms:   1. Ergonomics  Ergonomics refers to the study of how people (users) interact with objects (such as computer hardware) in order to maximise the ease of use and reduce the risk of injuries and other health-related problems. **✔** 2. RSI  A class of injuries (to tendons etc) caused by repetitive actions**✔** 3. CTS  Caused by inflammation of the tendons in the wrist, causing pressure on the nerves in the wrist, resulting in pain and sometimes weakness in parts of the hand**✔** | (1)    (1)      (1) |
| 9.5 | | What is meant by the term *green computing*?  Green computing refers to intiiaves to design, use and disposal of technology in an environmentally or eco-friendly way**✔** | (1) |
| 9.6 | | The paperless office has not made a significant impact on the rapid destruction of forests to make paper.   1. What is meant by the *paperless office*? The ‘paperless office’ refers to a concept of all documents in an office being stored, transmitted and processed electronically, instead of using hard copies**✔** 2. Give TWO reasons why the use of hard copies has not decreased. (Any TWO) **✔✔** Small portable devices with high-quality displays and long battery lives have only arrived recently to start to reduce the need for paper.   Not everyone can afford the portable technology needed to reduce their dependence on paper.  A hard copy can be the cheapest and easiest way to get copies of a finished product to the people who need to receive it.  Hard copies of documents are often needed for legal purposes. It’s not practical to use anything but paper for posters, etc. | (1)             (2) |
| 9.7 | | It is necessary to make users of computers and the Internet aware of potential dangers. Briefly explain the following:   1. Trojans – A destructive program disguised as a useful application. You are tricked into opening it as it seems to be legimitate software, so you open and run it**✔** 2. Phishing – Attempts to con the user into giving out personal confidential details by posing as a legitimate organisation, often a bank, usually via e-mail**✔** 3. Pharming – A situation where the user’s computer is infiltrated so that they are taken to another (fake) website even if they type in the correct URL(address) for the site**✔** 4. Email spoofing – is the changing of an email header so that the origin of the e-mail appears to be from a different source**✔** 5. Spyware – is software that tries to monitor and track the way you use your computer. It is installed on users computers without their knowledge. **✔** | (1)  (1)     (1)  (1)   (1) |
| 9.8 | | Learners may show interest in chat rooms. Give THREE suggestions to ensure ones safety in chat rooms.  Any THREE suggestions**✔✔✔**   * You always need to be aware that the person with whom you are communicating may not be who they say they are. * Never be tempted to give out any personal details such as your name, address or telephone numbers to people you meet online. * Do not make arrangements to meet someone you meet online. If someone wants to meet you in person, inform an adult and do not make any arrangements to meet them. * If someone makes you feel uncomfortable by asking personal questions or using bad language, then discontinue the ‘conversation’ immediately and tell your parents. * Don’t be tempted to use your real name in chat rooms. Rather use a nickname or alias that does not show your gender or age. * Never accept file transfers from strangers. Some chat programs allow users to exchange files. These files can potentially contain viruses or other harmful items. If possible, turn off this feature in your chat software. * Be suspicious of someone who is just too ‘perfect’. The details of what you like and enjoy are available for everyone to see. It is therefore very easy for someone to take that information and fake being your ‘soul mate’ to gain your trust. (This is how paedophiles work.) | (3) |
| 9.9 | | Communicating through emails require the use of common-sense guidelines.   1. Define the term netiquette Netiquette (Internet + Etiquette) is the name given to the use of good manners and showing respect for other users when using the Internet. **✔** 2. State THREE netiquette rules to observe in connection with emails. **✔✔✔** Use of capital letters, which means she is shouting. It contains spelling mistakes. It contains personal information | (1)  (3) |
| 9.10 | | Spam is a problem associated with e-communication.   1. Briefly explain what *spam* is. Spam is the electronic equivalent of ‘junk mail’. **✔** 2. State THREE ways in which you can try to prevent spam. Any THREE ways**✔✔✔**  * Check if your ISP can help. Many service providers filter out as much of the spam as possible. * Be careful of who you give your personal details and e-mail address to. Many websites and even some organisations ‘sell’ lists of contact details. * Investigate the capabilities of your e-mail program. Most programs have the ability to set up rules to filter out spam and automatically send it to a so-called Junk or Spam folder. These rules can be based on words appearing in the content of the e-mail or if e-mail comes from a particular sender. * Most anti-virus programs have anti-spam software included. Specialised anti-spam software also exists. * Never respond to spam (this merely confirms a valid e-mail address). | (1)  (3) |
| 9.11 | | Computer viruses are a constant threat to computers.   1. State TWO ways in which a computer may be infected with a virus. Any TWO ways**✔✔**   infected attachments sent with e-mail messages infected downloaded files from the Internet  infected files stored on portable media such as a flash drive.   1. Why is it necessary to update anti-virus software?  As new viruses come out daily, virus definitions need to be updated often and can be downloaded from the Internet for the anti-virus software you have installed. **✔** 2. Give an example of an anti-virus software package Any ONE**✔** McAfee, AVG, Kaspersky, Norton, Bit Defender. | (2)          (1)    (1) |
|  | |  | **[35]** |
|  | **MARKS: 150** | |  |