



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

**NATIONAL
SENIOR CERTIFICATE**

GRADE 12

INFORMATION TECHNOLOGY P2

NOVEMBER 2010

MEMORANDUM

MARKS: 180

This memorandum consists of 15 pages.

SECTION A: MULTIPLE-CHOICE QUESTIONS**QUESTION 1**

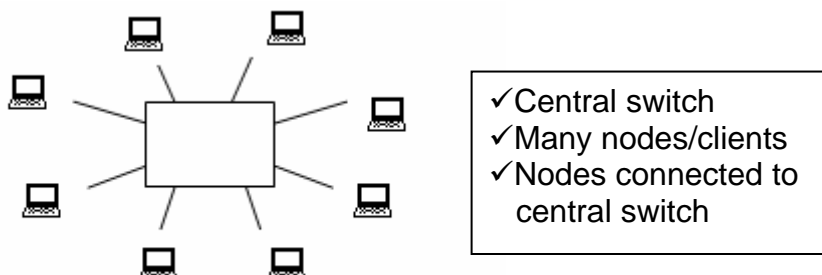
- 1.1 Which of the following does NOT break the copyright law? **B✓** (1)
(Downloading music made available by podcasters from the internet)
- 1.2 Open-source software is ... **B✓** (1)
(software for which the source code is freely available)
- 1.3 A digital ... is a secure digital identity that certifies the identity of the holder on the Internet. **A or C✓** (1)
(certificate) or (signature)
- 1.4 The most popular LAN-communication standard used today is ... **D✓** (1)
(Ethernet)
- 1.5 Which one of the following is the ODD ONE OUT? **A or C or D✓** (1)
(Norton Antivirus) of (Linux) of (MS – DOS)
- 1.6 People with the same interests who want to chat online will make use of **C✓** (1)
(IRC)
- 1.7 ... is high speed memory used for the temporary storage of data or instructions likely to be needed next by the processor. **B✓** (1)
(Cache memory)
- 1.8 Which one of the following statements is NOT associated with green computing? **D✓** (1)
(Companies should replace their computers regularly.)
- 1.9 A ... port is a high speed port most suited to connecting digital and video cameras **B✓** (FireWire) (1)
- 1.10 A technique used by intruders to make their network or internet transmission appear legitimate to a victim is referred to as **B✓** (spoofing) (1)

TOTAL SECTION A: 10

SECTION B: HARDWARE AND SOFTWARE**QUESTION 2**

- 2.1 2.1.1 She would be required to install the **drivers** for the new software ✓✓ OR (2)
The hard drive could be formatted using NTFS which has security implications which means access is restricted.
- 2.1.2 (a) When the hard drive is partitioned, it would appear as if there is more than one hard drive. ✓✓ (2)
OR When one physical hard drive is 'divided' into several logical drives.
- (b) Any TWO: ✓✓ (2)
- Different operating systems can be installed
 - Better security can be maintained
 - Better for backup procedures if the data is on one partition and the programs on another.
 - The second partition is less prone to be infected by a virus
- 2.1.3 Plug and Play ✓ (1)
- 2.1.4 Hot swappable ✓ or Hot pluggable (1)
- 2.1.5 Any TWO: ✓✓ (2)
- Processor or CPU
 - RAM or memory
 - Hard drive
 - Graphics card
- 2.1.6 Heat Sink: Any ONE: ✓ (2)
- Directs the heat away from the processor (or similar description)
 - Absorbs and ventilates heat produced by the processor
 - Increases the surface area for heat exchange
- Fan: blows the hot air out of the box ✓
- 2.1.7 Any THREE: ✓✓✓ (3)
- More compact, less bulky / smaller / take up less space
 - Quality of the display is much better / better resolution / sharper images
 - Produces less heat
 - Reduces power consumption
 - Easily accessible / more available than CRT screens, support (maintenance services) is more available
 - Area of visibility is smaller (images only visible when in front of the screen) / information on screen more private
 - Flicker-free images / no refreshing required

- 2.2 2.2.1 (a) Any THREE: ✓✓✓ (Explanations were required) (3)
- Sharing of hardware
 - Sharing of software
 - Saves time (reason **must** be provided e.g. faster to install software on all the computers / faster distribution of information)
 - Centralisation of data
 - Cost effective (reason **must** be provided – other reason than already mentioned e.g. sharing an Internet connection)
 - Improves communication
 - Entertainment (provide an example e.g. playing LAN games)
 - Making of backups is easier
 - Improves control in terms of rights and privileges / software installed / access
- Or an explanation of any other valid advantage of a having a network
- b) Any TWO: ✓✓ (2)
- Need a technician to maintain the network / not easy to maintain / need a specialist to be responsible for maintaining the network
 - Requires a network-oriented operating system / requires network software
 - Cost **with** a valid reason.
 - The network is down when the server is down.
- OR other correct answers – not repeating any previous answers
- (c) Any TWO: (regarding preventing unauthorised access) ✓ ✓ (2)
- Setup of users' rights and privileges to establish privacy and security for users
 - Monitor suspicious activities on the network
 - Managing accounts or delete accounts or creates accounts
Set up passwords on accounts
 - Controlling Internet access
- NB** – Do not allocate marks when answers repeat the content of previous answers.
- 2.2.2 (a) Labels are optional. If provided the labels must be correct. (3)



- (b) UTP cables ✓/Unshielded twisted pair/Twisted pair/CAT 5 or (3)
CAT 5e (accept from CAT 3)
ANY TWO ✓✓
Cheaper
Easy to set up
High speed over short distances
OR
Fibre Optic Cables ✓
Any TWO: ✓✓
Less susceptible to EMI
High speed data transfer
Less susceptible to attenuation
- (c) Any TWO: ✓✓ (2)
- Connects several devices in a network.
 - Transmits signals/Amplifies and transmits signals
 - Can detect errors and isolate the error so that the network can still be functional
 - Can send data to the required destination on the network or chooses the correct / best path to follow OR Intelligent pathing OR controls / reduces traffic OR manages the bandwidth
 - Amplifies signals
- (d) (i) The name of a popular wireless networking technology (2)
that uses radio waves to provide wireless high-speed Internet and network connections
✓ wireless / radio waves
✓ connect two or more devices / network / communicate
- (ii) Any TWO: ✓✓ (2)
- Speed/bandwidth can be affected with many users
 - Security/uncontrolled access
 - WiFi is most suited for mobile devices, schools have
 - standard computer equipment that is fixed in the room
- (iii) Any TWO: ✓✓ (2)
- WiFi cards
 - (Wireless) router
 - Wireless Access point
 - Antenna
- 2.3 2.3.1 DRAM – slower than DDR2 ✓✓ (2)
OR
DDR2 – allows transfer of data twice as fast per tick of the system clock as DRAM

- 2.3.2 (a) Pipelining – occurs when the CPU is able to read and execute new instructions ✓ from memory/ which are loaded ✓ before the instruction that is busy being processed is completed. ✓ (3)
- (b) Superscalar – Any ONE: ✓ (1)
- Having more than one pipeline
 - Processor can execute more than one instruction per clock signal.
- (c) Hyperthreading – allows the operating system to view a single processor ✓ as having TWO processors. ✓ (2)
- OR
One CPU can mimic the power of two processors.
NB. No marks for explaining multithreading.
- (d) Any TWO facts: ✓✓ (2)
- RAID – stands for Redundant Array of Inexpensive / Independant Disks
 - RAID is a number of disks grouped together by a special controller and treated as one big disk.
 - It can be used to improve data reliability as it duplicates or spreads data across the disks
 - The use of the word "backup" may be accepted if used in the context of "restoring data or information".
- NOTE: Also accept more technical facts if the facts are correct
- (e) Clock multiplication: Allows the CPU to run at faster speeds ✓ than the supporting motherboard. ✓ (2)
- OR For every tick of the system clock, the CPU processes more than one instruction / at a faster rate
OR The CPU's own clock ticks faster than that of the motherboard / generates at least 10 ticks for every tick of the system clock
OR Multiplying the ticks of the system clock with a factor to determine the processing speed of the CPU.
- 2.3.3 Any ONE: ✓ (1)
Symbian OS / Android / WebOS / Linux
- 2.3.4 (a) File compression utility – makes the size of the file smaller ✓ e.g. when a file is too big to fit on a storage device such as a flash disk. ✓ (2)
OR any other sensible and correct example.
- (b) File conversion utility – changes the format of a file ✓ e.g. when a Windows Audio file must be converted to a MP3 file to be able to play the music on your computer ✓ (2)
OR any other sensible and correct example.

- 2.3.5 A 32-bit operating system uses 32-bit architecture/registers/ computer words✓ and a 64-bit operating system uses 64-bit architecture/registers/computer words✓ (2)
OR 64-bit OS can address more memory than 32-bit OS
- 2.4 2.4.1 (a) a device that is used to capture video and still images. ✓ (1)
OR a device that is used to capture video images.
OR uploads an image onto the Internet.
- (b) ANY ONE ✓ (1)
Skype / NetMeeting / Windows Media Player / Cam Studio / DumDum
OR any other recognized software that will make use of a web cam.
- 2.4.2 Any ONE: ✓ (1)
Microphone / Modem / Speakers / Network Card / HeadSet

TOTAL SECTION B: 58

SECTION C: APPLICATIONS AND IMPLICATIONS

QUESTION 3: e-COMMUNICATION

3.1 3.1.1 Podcasting is a method of distributing recorded audio ✓ in a format ✓ (usually an MP3 file) suitable for devices such as iPods. These audio files are published as audio files on the Internet and can be downloaded to a computer or portable media player. (2)

3.1.2 Any TWO: ✓✓ (2)

- Published on the Internet which will reach more potential clients.
- Can advertise the company in a fun way.
- Cost-effective way of advertising.
- Can be used for educational purposes.
- Information can be added to ensure client satisfaction.

3.2 (4)

IM	E- Mail
Instant/live/ Synchronous ✓	Does not have to be live/ ASynchronous ✓
Does not allow for attachments ✓	An attachment is allowed ✓
Initiated by mutual consent	Not necessarily mutual consent
Users must have the same IM service	Does not have to have the same service
The size of messages are limited	The size of messages are not ot limited

3.3 3.3.1 These spaces/sites have been specially designed for viewing on mobile devices ✓ /hand held devices such as cellphones. (1)

3.3.2 Any ONE: ✓ (1)

The site is accessible to a larger group of people
A computer is not required.
Access from a mobile device

[10]

QUESTION 4: SOCIAL AND ETHICAL ISSUES

4.1 Any ONE software package suitable for the business world ✓ (2)

- E-mail
- Word Processor
- Spreadsheet
- Web Browser

Appropriate motivation for package selected related to a working environment. ✓

- 4.2 Any TWO: ✓✓ (2)
- Learners can take apart computers and learn about hardware
 - Teachers can set up a display of computer parts and use those for instruction purposes
 - Internet Access
 - Running tutorial software
 - Computer Literacy
- OR ANY other reason relating to education
- 4.3 Any TWO: ✓✓ (2)
- Old computers run old software – no support.
 - Learners will be trained in old software packages not being use.
 - Cannot source replacement hardware easily.
 - Computers will be slow and frustrate learners.
 - Drivers may not be available.
 - Funds may be required for upgrading purposes.
 - More expensive to maintain than new computers.
 - Does not support green computing as these computers may contain harmful substances.
 - Difficult to dispose off old computers
- 4.4 Any TWO: ✓✓ (2)
- Network Administrator
 - Computer Trainer/Teacher
 - IT Technician / Specialist
 - Project Manager
- 4.5 Yes/No✓ NOTE: Award 0 for a Yes/No answer with no justification (2)
Justification✓
- Yes
Email is a bulk email and clients might not have requested to receive emails about outreach projects
- OR
- No
The project is a worthy cause and is not used to make a profit for the company

[10]**TOTAL SECTION C: 20**

SECTION D: PROGRAMMING AND SOFTWARE DEVELOPMENT**QUESTION 5: ALGORITHMS AND PLANNING**

- 5.1 5.1.1 A primary key is a field which has a unique value for each record in the table OR uniquely identifies a record in the table ✓ (1)
- 5.1.2 CustomerID✓ (1)
- 5.1.3 It is a used to link the TWO tables ✓✓OR used to create a relationship between the two tables (2)
- 5.1.4 Any ONE: ✓✓ (2)
- Numbers will not allow for the leading zeros
 - The size of most numbers is not sufficient to store the full telephone number
 - The format of all text cannot be converted to a number format
- 5.2 5.2.1 Any TWO: ✓✓ (2)
- Less duplication of data (e.g. repeating technician details)
 - Prevents update anomalies (e.g. if a technician's details are changing the change only happens in one place)
 - Prevents delete anomalies (e.g. all related data will be deleted when a record is deleted)
 - Easier to query database
- 5.2.2 Apply negative marking (subtract 1 mark for each incorrect answer up to a maximum of 3 marks) (3)
- (a) 1
- (b) 2
- (c) 2
- (d) 1
- (e) 2
- (f) 1
- (g) 3
- 5.3 5.3.1 (a) TRUE✓ or YES (5)
- (b) FALSE ✓ or NO
- (c) FALSE ✓ or NO
- (d) FALSE✓ or NO
- (e) TRUE✓ or YES
- 5.3.2 IF RATING \geq 7 **AND** ✓FULLTIME = NO THEN (1)
- NOTE: Learners only had to replace the OR-operator with an AND-operator but if the conditions were changed, the entire statement must test for the conditions correctly

- 5.4 5.4.1 Int/Integer/Byte/ShortInt/Long/LongInt/Word (1)
- 5.4.2 (a) LOOP UNTIL COUNTER = 12✓✓ (2)
OR
LOOP UNTIL COUNTER > 12-1
OR
LOOP UNTIL COUNTER > 11
OR
LOOP WHILE COUNTER <= 11
OR
LOOP WHILE COUNTER < 11
OR
LOOP WHILE COUNTER >=12
OR
LOOP FROM 6 TO 11
- (b) An error which interrupts the executing of a program✓ OR (1)
Terminates the running of the program.
- 5.4.3 (a) Logical error✓ (1)
- (b) The value of counter would be incorrect in Line 9✓✓ (2)
OR
LINE 9 should be
AVERAGE_JOBS ← TOTAL_JOBS / 6
NOTE: COUNTER to be divided by 2 OR (COUNTER - 6)
- (c) LINE 9 should be (2)
AVERAGE_JOBS ← TOTAL_JOBS / 6 ✓✓
NOTE: COUNTER to be divided by 2 OR (COUNTER - 6)
- An incorrect answer from 5.4.2(a) must be followed through for Question 5.4.3 (c).
- 5.5 5.5.1 Website C✓ (1)
- 5.5.2 (a) Normal: 28/02/2010✓ (or similar data well within the (1)
acceptable range of data for the application)
- (b) Erroneous: 246734 or some Text✓ (or similar data that is (1)
clearly not within the acceptable range of data for the
application)
- (c) Extreme: 31/12/5943✓ (or similar data that will test extreme (1)
values)
- 5.5.3 Invalid – Value not in a required range – can usually be validated (2)
using programming code e.g. select 30 as days but month as 2 –
not allowed ✓
- Incorrect – data is allowed and meets the requirements for being
valid, but the data is not correct e.g. The date to be entered is 30
March but the user enters the date 20 March ✓

- 5.5.4 Any ONE: ✓ (1)
- Provide a label / tooltip text with the format
 - Use Input mask / Use a masked edit box
 - Provide an example of the format / contextual help
- 5.5.5 Website C: Could take user too long to find the correct date✓ (1)
OR
Programmer would need to constantly change the range of years as time goes on.
- 5.5.6 Any THREE: ✓✓✓ (Regarding the construction of the error message. NOT where it has to be displayed or how long etc.) (3)
- Clearly specify why the error occurred
 - Give a clear description of the error.
 - Indicate where/when the error has occurred.
 - Include a solution to the problem.
 - Make the error message easy to read and understand.
 - Do not use technical terms/abbreviations.
- 5.6 5.6.1 Public means the entity can be accessed from outside the class ✓ (2)
and private only from within the class/unit where the class is defined✓
- 5.6.2 (a) default constructor✓ (1)
(b) parameterised constructor✓ (1)
- 5.6.3 (a) Any ONE of the get methods✓ (1)
(b) setRating✓ (1)
- 5.6.4 To provide code which describes the values of the object attributes✓ used for display/output purposes✓ (2)
OR
Combines fields into a single string
- Delphi Candidates only:*
Function used to convert numbers to a string value
- 5.6.5 + getName():String✓✓ (2)
OR any descriptive variable that describes the technician
with the correct data type

TOTAL SECTION D: 47

SECTION E: INTEGRATED SCENARIO**QUESTION 6**

- 6.1 6.1.1 Any TWO: ✓✓ (2)
- RFID tags have memory chips that can store information and communicate/radio signals used with a computer system.
 - Can be embedded in glass, labels or cards.
 - No direct contact required.
 - Not transmitting all the time.
 - Does not need a power source.
- 6.1.2 Any TWO: ✓✓ (2)
- Identify/Tracking times of runners in a marathon,
 - tracking location of soldiers,
 - tracking airline baggage or stolen goods,
 - tracking of library books,
 - tracking payment as vehicles pass through booths at toll gate systems,
 - access control to areas,
 - track goods being manufactured.
- 6.1.3 Any TWO: ✓✓ (2)
- Scanners, bar code readers, magnetic-strip readers, magnetic-ink character recognition readers.
- 6.2 6.2.1 Radio waves ✓ (1)
- 6.2.2 WAN OR MAN ✓ (1)
- 6.2.3 Any THREE: ✓✓✓ (Or any other correct guideline) (3)
- Enough bandwidth so that the connection is fast enough
 - Affordable
 - Host website at no additional cost
 - Provide several types of connections
 - Is there a limit on the volume of data that you are allowed to download
 - Is the connection reliable – not offline most of the time
 - Good reputation
 - Provide protection against viruses and spam.
- 6.3 6.3.1 Type of system software / program ✓ that allows a user to perform maintenance-type tasks ✓ usually related to managing a computer ✓, its devices or its programs (3)
- 6.3.2 Any ONE ✓✓ (2)
- A firewall helps protect your computer by preventing unauthorized access to the network from the Internet or another network.
 - Prevents ports from being illegally used
 - Prevents programs from illegally communicating with the computer.

- 6.3.3 (a) A computer virus is a potentially damaging computer program ✓ that affects or infects a computer negatively ✓ by altering the way the computer works without the user's knowledge or permission ✓ OR copies itself. (3)
- (b) Any THREE: ✓✓✓ (3)
- Screen displays unusual messages
 - Unusual sounds play
 - Available memory is less than expected
 - Existing programs and files disappear
 - Files become disrupted
 - Programs or files do not work properly
 - Unknown programs or files appear mysteriously
 - System properties change mysteriously
 - Operating system runs much slower than usual
 - Warning from your anti virus program
- 6.4 Any THREE: ✓✓✓ (3)
- Make backups of data regularly
 - Make use of an UPS to give you time to save data in the event of a power failure
 - Save your work regularly while you work
 - Make backup on another device such as a CD or DVD (not your laptop) and keep it somewhere safe
 - RAID
 - Updated your anti virus program regularly
- Any other hint that make sense.
- 6.5 6.5.1 (a) Any TWO: ✓✓ Intel, AMD, Motorola, IBM, Transmeta (2)
- (b) Basic set of instructions that the CPU/computer ✓ can recognize and execute. ✓ (2)
- (c) Consists of four cores/processors ✓ combined on one chip ✓ (2)
- 6.5.2 (a) North bridge ✓ (1)
- (b) Transfers data and instructions between the CPU and RAM ✓ (1)
OR
Connects the CPU and RAM
- 6.5.3 (a) Reorganises the files ✓ so that file segments are placed together/in continuous clusters on the hard drive ✓ (2)
- (b) Can support more than 2 peripheral devices ✓ (2)
Fast data transfer rates ✓

- 6.6 6.6.1 Any TWO: ✓✓ (2)
- Longer passwords are better than shorter passwords
 - Do not choose obvious passwords such as your surname
 - Use a variety of different characters
 - Use a variety of uppercase and lowercase letters
- 6.6.2 (a) Biometrics✓ (1)
- (b) Any TWO: ✓✓ (2)
 Face, handprint, eye, voice, DNA
- 6.6.3 (a) A set of rules governing communications✓between two or (2)
 more computers/nodes/points✓
- (b) Encryption✓ (1)

TOTAL SECTION E: 45
GRAND TOTAL: 180