



# education

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Department:  
Education  
**REPUBLIC OF SOUTH AFRICA**

**NATIONAL  
SENIOR CERTIFICATE**

**GRADE 12**

**INFORMATION TECHNOLOGY P2**

**NOVEMBER 2009**

**MEMORANDUM**

**MARKS: 180**

**This memorandum consists of 13 pages.**

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

- |      |          |  |     |
|------|----------|--|-----|
| 1.1  | <b>B</b> | 3G card/adapter  | (1) |
| 1.2  | <b>A</b> | GUI  | (1) |
| 1.3  | <b>D</b> | External hard drive  | (1) |
| 1.4  | <b>C</b> | Bluetooth  | (1) |
| 1.5  | <b>A</b> | More RAM   | (1) |
| 1.6  | <b>C</b> | Pipelining   | (1) |
| 1.7  | <b>A</b> | Ethernet   | (1) |
| 1.8  | <b>D</b> | FSB  | (1) |
| 1.9  | <b>C</b> | can be connected/disconnected even when the computer is on                             | (1) |
| 1.10 | <b>A</b> | needs to be updated regularly in order to ensure protection from newly created viruses | (1) |

**TOTAL SECTION A: 10**

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

- 2.1 2.1.1 Intel✓ & AMD✓ (2)
- 2.1.2 That Computer A (Quad Core) has 4 CPUs✓ on the chip and Computer B (Dual Core) has only 2 CPUs✓ on the chip. (2)
- (a) The CPU creates its own extra ‘ticks’ for every tick of the motherboard / system clock. ✓ Accept any clear explanation of a clock multiplication process. (1)
- (b) Clock multiplication✓ (1)
- (c) E.g. Motherboard 100 MHz x 24✓ = CPU 2.4 GHz✓ (2)
- 2.1.4 Cache is fast memory✓ used to temporarily ✓ hold data / instructions recently fetched from RAM✓ (needed by the CPU)  
**OR**  
Cache is a way of speeding up access to a slow medium✓ by storing parts of its contents temporarily✓ in a faster medium. ✓  
**OR**  
Any description / definition in the candidate’s own words which accurately approximates either of these two definitions. (3)
- 2.1.5 The instruction set is the basic set of instructions that a CPU can recognise ✓and execute.✓ (2)
- 2.1.6 Any TWO✓✓ of the following:  
  
More logic (working) circuits (can do more work)  
More cache – faster performance  
Faster speeds possible  
NOT:  
Reduces heat  
Less power needed (2)
- 2.1.7 Fetch✓– instruction / data fetched from cache / RAM✓  
Decode ✓– instruction decoded into opcode & data✓  
Execute ✓– instruction is executed (when applicable) ✓  
Data transfer✓ – optional – data is transferred to register / RAM✓  
(Accept variations but allocate marks for the basic steps mentioned above. The steps may be named differently.) (8)

- 2.2 2.2.1 Speed. ✓The speed of data transfer between CPU and RAM. ✓ (2)
- 2.2.2 DDR allows data to be transferred twice on a clock tick✓  
– when the voltage rises (when the tick starts) and when the voltage drops✓ (when the tick stops).
- NB: If the learner explains Quad Pumping (i.e. 4 x transferral) then this can be accepted as well. (2)
- 2.3 Computer A✓ – because it has the better graphics card✓.  
(Also accept: It uses Windows, fewer games available on Linux.) (2)
- 2.4 Computer B uses all OSS software✓ – free / no cost ✓ (2)
- 2.5 2.5.1 The computer appears to run multiple programs✓ at once. ✓  
NB: The ‘appears’ is not essential. (2)
- 2.5.2 Multithreading is when a single program✓ is broken up into independent parts✓ that run at the same time✓ (3)
- 2.5.3 A word processor does spell checking whilst you are typing. ✓  
(ANY appropriate explanation that explains 1) single program, 2) multiple independent parts and any valid example.) (1)
- 2.6 2.6.1 (a) VoIP = Voice over Internet Protocol✓ (1)
- (b) It allows the user to make voice and video calls over the Internet. ✓ (1)
- (c) It would save them money✓ as they could communicate with people in their home country at lower costs than normal phone calls. ✓ Allow for video/web conferencing. (2)
- 2.6.2 Mozilla Firefox✓ (1)
- 2.7 2.7.1 It is possible that the drivers for certain devices might not be included in the database of drivers included as part of the operating system because the device might be very old or new ✓ (Any acceptable explanation) (1)
- 2.7.2 A driver translates✓ the general-purpose OS instructions✓ into commands that the hardware understands✓.  
(Any appropriate description along these lines can be accepted.) (3)

- 2.8      2.8.1      Virtual memory is hard disk space✓ that is reserved by the operating system✓ to be used as additional memory. ✓      (3)
- 2.8.2      Thrashing is when the computer has to spend so much time swapping content✓ between RAM and virtual memory that it has little time for any other work. ✓      (2)
- 2.8.3      Buy more RAM! ✓  
                    (Also accept: Run fewer programs at the same time.)      (1)
- 2.9      Spooling is when the print job is stored as a file on disk✓ and sent to the printer bit by bit when the printer is ready for it. ✓      (2)

**TOTAL SECTION B:      54**

**SECTION C: APPLICATIONS AND IMPLICATIONS****QUESTION 3: e-COMMUNICATION**

- 3.1 Spam is unwanted ✓/ unasked-for e-mail✓. (2)
- 3.2 Must be a well-known author✓  
Make use of cross references to verify information✓  
Validate the source – who is publishing the information, who pays for the web page, what is the purpose of the web page✓  
(Accept other valid answers.) (3)
- 3.3 A phishing e-mail looks like a notice from your bank or other institution that tells you that you have to update your details✓. It has a link to a fake website where the thieves capture your data✓ The purpose is to steal your banking details/personal information to be able to steal money from your bank account /steal your identity. ✓ (3)
- 3.4 Speed: People can communicate faster and therefore the turnaround time for work is short; decisions can be made quicker.✓  
  
Convenience: People can be connected to the Internet (and the rest of the world) from almost anywhere – do not have to go to the post office or a specific place✓. Increased efficiency. (2)
- [10]**

**QUESTION 4: SOCIAL AND ETHICAL ISSUES**

- 4.1 No✓, it is unethical because he will copy the software illegally which is breaking the law / stealing / pirating.✓  
NB: Do not accept 'Yes' as an answer at all. (2)
- 4.2 Any TWO✓✓ of  
Obesity through inactivity  
Lack of fitness through inactivity  
RSI (e.g. carpal tunnel syndrome)  
Eye strain which can lead to headaches, double vision, etc.  
Posture problems (backache, rounded shoulders, etc.) (2)
- 4.3 Any TWO of  
Blogs – public diaries – write your opinion on matters of interest such as the results of soccer games and the performance of players  
IRC – web page based on chat rooms – conversation style – interactive  
Facebook – \_\_\_\_\_  
Twitter – \_\_\_\_\_  
Other suitable examples.  
TWO examples: one mark for name and one mark for explanation. (4)
- 4.4 Any TWO✓✓ of
- Give free access to learners for school work
  - Offer computer literacy classes
  - Set up a website where community members can market and sell arts and crafts
  - Any other VALID creative use of computers that can benefit the community. (2)

**TOTAL SECTION C: 20**

**SECTION D: PROGRAMMING AND SOFTWARE DEVELOPMENT**

**QUESTION 5: ALGORITHMS AND PLANNING**

- 5.1 5.1.1 To be valid: Test whether the year of birth is smaller or equal to the current year. If the year of birth is equal to the current year, the month of birth must be less or equal to the current month. If the month is equal to the current month, then the day of birth must be less or equal to the current day✓  
Is the month value within the range of 1 to 12 (inclusive)✓  
Is the birthday less or equal to the maximum number of days of the particular month✓ (3)
- 5.1.2 (a) Any example using the date of birth where the tests listed in QUESTION 5.1.1 will not detect the error.  
Example: the year 76 is entered instead of 77✓ (1)
- (b) Make a printout of the entered data and ask the person to check the data on the printout before capturing the data permanently.✓  
The program must display the captured data on the screen and allow the user to check the data again before submitting the data to be saved permanently.✓ (2)

5.2 5.2.1

Statement number	Date	oneLine	Name	Time	Time <= 12:00	Time <= 18:00	Lunch list	Dinner list
2	12/10/2009							
4		Peter#10:15						
6			Peter					
7				10:15				
8					Yes			
9							Peter	Peter
10						Yes		Peter
4		Sam#14:40						
6			Sam					
7				14:40				
8					No			
10						Yes		
11								Sam
4		Joe#08:00						
6			Joe					
7				08:00				
8					Yes			
10						Yes	Joe	Joe
11								Joe
			✓	✓	✓	✓	✓	✓

(6)



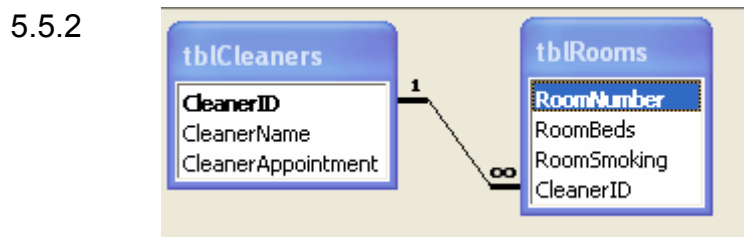
- 5.2.2 Statement 11: ✓ If the time is  $\geq 12:00$  and ✓ time is  $\leq 18:00$  ✓ (3)
- 5.2.3 Logical error: The results given by the program will be incorrect but the program will run. ✓
- Runtime error: Problems such as the file not being available will cause the program to stop executing as soon as it comes across the problem of trying to locate the file and displaying an error message. ✓  
(No marks for mentioning any syntax errors such as no semicolon, etc.) (2)
- 5.3 5.3.1 (a) Instantiates the object. ✓ / sets up the object according to the information received. ✓  
(Or any correct description.) (2)
- (b) Yes, ✓ each class has a default constructor that will be executed if the constructor is not defined by the programmer ✓.  
**OR**  
No, if there are arguments when the object is created, there has to be a user-defined constructor with matching parameters. (2)
- 5.3.2 (a) No ✓ (1)
- (b) If the method is declared as private, it belongs only to the class. Other classes cannot call the method. ✓ ✓  
(Or any other correct explanation.) (2)
- (c)  $fNumDays \leftarrow days$  ✓ or other acceptable statement assigning new information to the private field  $fNumDays$  (2)
- 5.4 5.4.1 Any THREE ✓ ✓ ✓
- Use well-known layouts – such as Windows.  
Group functions and features e.g. put everything that relates to each other, such as file functions, together.  
Use hints and user-friendly captions – user must know where to find required functions.  
Always indicate what to do next.  
Always supply a way to get back to previous options or back to the main screen.
- (Or any other guideline that will improve navigation specifically.)
- (NOT aspects regarding readability, such as colour and font.) (3)

5.4.2 (a) Any TWO ✓✓  
Easier to read and understand smaller sections  
Easier to find and correct errors in smaller sections  
Can use module repeatedly – do not have to retype code  
(or other acceptable answers) (2)

(b) Any TWO ✓✓  
Use a readable structure – indentation, blank lines  
Use descriptive variable names  
(or other acceptable answers) (2)

5.4.3 Any THREE ✓✓✓  
Explain the error in understandable terms to the user  
Indicate how to solve the problem  
Give an indication whether it has been a program error or an error due to something the user did  
Give an indication of whether the error is due to a problem with the software or hardware  
(or other acceptable answers) (3)

5.5 5.5.1 (a) RoomBeds ✓ (1)  
(b) RoomSmoking ✓ (1)  
(c) CleanerAppointment ✓ (1)



(a) 2 correct tables ✓✓ with correct fields in each table ✓✓ (4)  
(b) Primary keys indicated:  
CleanerID in the tblCleaners table ✓  
RoomID in the tblRooms table ✓ (2)  
(c) Foreign key is CleanerID ✓ in the tblRooms table ✓ (2)  
(d) One-to-many relationship correctly indicated ✓ (Many on the tblRooms side) (1)

**TOTAL SECTION D: 48**

**SECTION E: INTEGRATED SCENARIO****QUESTION 6**

- 6.1 6.1.1 (a) ADSL – Cables (1)
- (b) 3G – Cellular technology (1)
- (c) iBurst – Radio technology (1)
- 6.1.2 (a) 3G or iBurst✓ (1)
- (b) ADSL – faster cable option ✓ (1)
- 6.1.3 (a) Any THREE✓✓✓
- TCP – Ensures reliable data transfer  
 IP – Establishes Internet communication  
 FTP – Ensures easy transmission of large files  
 SMTP – Responsible for the delivery of e-mail  
 Telnet – Allows you to log on to a remote computer and then allows you to work on that computer as if you are physically sitting in front of it. (3)
- (b) The message is divided into smaller parts, named packets✓  
 Packets are sent to the destination via different available routes. ✓  
 Packets are re-assembled at the destination before the message is delivered. ✓ (3)
- 6.1.4 (a) A router is used to connect LANs and WANs✓ / connects multiple computers or other routers together / Allows multiple computers to share a single high-speed Internet connection. Chooses the fastest, most effective route for data, reducing the traffic on the network✓.  
 Ensures safe transmission of data ✓ Many routers have a built-in firewall. (3)
- (b) No. ✓ (1)
- (c) A firewall prevents unauthorised programs from accessing your computer via the Internet✓ and stops computers on the network that your computer is part of, from accessing your computer. ✓  
 Learners might talk about blocking ports as well. (2)

- 6.2      6.2.1      Any THREE ✓✓✓  
  
Saving paper, communication costs such as phone calls, no travelling to find Internet facilities or pay for their own Internet facilities  
(or any other sensible answer) (3)
- 6.2.2      Any THREE ✓✓✓  
  
Network administrator, PC technician, web authoring, network security consultant (3)
- 6.3      6.3.1      Client-server network has a more powerful PC that will act as the server. ✓  
The server is never used as a normal user-PC ✓.  
The server supplies resources to the clients. ✓ The clients do not supply resources but only use the resources supplied by the server.  
The server can be used to control the security (access) ✓ and activities that take place on the network. (4)
- 6.3.2      Needs to control access ✓ – many people will be using the computers.  
Can protect information / software better ✓  
(or any other good reason) (2)
- 6.4      6.4.1      (a) Spyware is software that monitors what is on your computer and what you do with it ✓ – e.g. what websites you visit. (1)  
  
(b) You stop it with anti-spyware / anti-virus software. ✓ (1)
- 6.4.2      (a) A Trojan horse can be a program that performs a useful function ✓ such as a screensaver or game or utility but also includes hidden features ✓ such as stealing your data or crashing your computer. (2)  
  
(b) To avoid them don't download or install software ✓ except from sources you trust ✓. (2)
- 6.5      6.5.1      RAID ✓ (1)
- 6.5.2      RAID 1 = Mirroring ✓. (1)

6.6	6.6.1	This is like an online diary✓ where you can share your activities, interests and meet people✓ – and have them interact with you. Used to keep in touch with friends✓ and meet new people. (Be flexible when marking this answer – mentioning of online diary and one other aspect of use will be acceptable.)	(3)
	6.6.2	(a) Identity theft is when someone steals / collects enough information✓ to successfully pretend to be that other person✓.	(2)
		(b) ANY example that shows that people are stealing information to pretend to be another person in an official capacity. Example: Take out loans in your name.	(1)
6.7	6.7.1	Secure Socket Layer✓	(1)
	6.7.2	Any THREE✓✓✓ of  Longer than 8 characters Mixed case Use punctuation Use numbers Don't use ID / phone / car reg / DOB / family names / address Use different passwords in different places.	(3)
	6.7.3	Encryption is scrambling data✓ by following a set of rules✓.	(2)
<b>TOTAL SECTION E:</b>			<b>48</b>
<b>GRAND TOTAL:</b>			<b>180</b>