



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 12

INFORMATION TECHNOLOGY P2

EXEMPLAR 2014

MEMORANDUM

MARKS: 150

This memorandum consists of 12 pages.

SECTION A: MULTIPLE-CHOICE QUESTIONS

QUESTION 1

- | | | |
|------|-----|-----|
| 1.1 | D ✓ | (1) |
| 1.2 | C ✓ | (1) |
| 1.3 | D ✓ | (1) |
| 1.4 | C ✓ | (1) |
| 1.5 | C ✓ | (1) |
| 1.6 | A ✓ | (1) |
| 1.7 | B ✓ | (1) |
| 1.8 | B ✓ | (1) |
| 1.9 | B ✓ | (1) |
| 1.10 | A ✓ | (1) |

TOTAL SECTION A: 10

SECTION B: SYSTEM TECHNOLOGIES

QUESTION 2

- | | | | |
|-----|-------|--|-----|
| 2.1 | 2.1.1 | <p><i>Any TWO ✓✓</i></p> <ul style="list-style-type: none"> • Provide connectors to allow other circuits (CPU, RAM, etc.) to connect to it. • Ensure that all components of the computer can communicate with one another. • Distribute power to the parts that connect to it. | (2) |
| | 2.1.2 | Bus ✓ | (1) |
| | 2.1.3 | Certain motherboards have modular components built on ✓ to the motherboard such as a graphics card or sound card. | (1) |
| | 2.1.4 | Manages data flow between components. ✓ | (1) |
| 2.2 | 2.2.1 | Software stored on ROM chips. ✓ | (1) |
| | 2.2.2 | <p><i>Any ONE ✓</i></p> <ul style="list-style-type: none"> • Additional functionality or features are added • A bug or problem has been corrected • Support for newer hardware that was not previously available | (1) |
| 2.3 | 2.3.1 | Virtualisation is a host operating system ✓ that can allow additional operating systems to run as separate virtual machines. ✓ The virtual machines appear as standalone computers. | (2) |
| | 2.3.2 | <p><i>Any TWO relevant advantages ✓✓</i></p> <ul style="list-style-type: none"> • Able to run different operating systems or different versions of operating systems on the same machine • Having a backup system identical to your current system. • Protection of data by running applications in separate virtual machines • Saving on hardware cost by not having to buy separate machines for each system/application | (2) |

- 2.4 2.4.1 Improves throughput by completing multiple parts of instructions simultaneously. ✓ Each stage processes a part of the instruction cycle in parallel with the other stages. ✓
- OR**
- A method of processing that allows several instructions✓ to be processed at the same time✓ by more effectively using processing stages.
- OR**
- A processing method that allows the next instruction to be loaded from memory✓ before the previous instructions have been fully completed.✓ (2)
- 2.4.2 Hyperthreading ✓ (1)
- 2.5 2.5.1 *Any ONE* ✓
- No need for powerful server hardware
 - No need to manage software or data locally
 - Updates to the software occur automatically (1)
- 2.5.2 *Any ONE correct example* ✓
- Google Apps/Gmail
 - Microsoft Office 365
 - Any other correct example (1)
- 2.6 2.6.1 Plug and play ✓ (1)
- 2.6.2 The device is automatically identified by the operating system✓ and the necessary driver is installed from a library of available drivers✓. (2)
- 2.7 2.7.1 *Any TWO* ✓✓
- No physical keyboard so typing is more difficult
 - Less powerful hardware
 - Smaller screen size (2)
- 2.7 2.7.2 (a) Mobile/Tablet ✓ – device will need to be carried around/ device must be able to be used for long periods of time with its own power source✓ (2)
- (b) Computer/Laptop/Desktop ✓ – need for a larger screen/need a full-size keyboard for entering large amounts of data✓ (2)

TOTAL SECTION B: 25

SECTION C: COMMUNICATION TECHNOLOGIES AND NETWORK TECHNOLOGIES

QUESTION 3

- 3.1 3.1.1 *Any TWO ✓✓*
- Centralisation of data
 - Sharing of hardware
 - Sharing of software
- (2)
- 3.1.2 • Reliable because if one client goes down the network still operates✓
- 3.1.2 • Central device directs traffic from sender to receiver without having to broadcast to all other devices on the network ✓
- (2)
- 3.1.3 Bus/Ring ✓
- (1)
- 3.2 3.2.1 Network service provider/ISP ✓
- (1)
- 3.2.2 *Any TWO relevant advantages ✓✓*
- No signal loss due to locations
 - Possible to have a guaranteed bandwidth
 - Data cost is generally lower
- (2)
- 3.3 3.3.1 Their connection speed is decreased/slower✓ because the bandwidth of the access point is shared among all connected clients. ✓
- (2)
- 3.3.2 WiMAX ✓
- (1)
- 3.3.3 *Any TWO relevant impacts ✓✓*
- People are permanently in contact
 - Meet/interact with more people
 - Exposed to more diverse ideas/cultures/view points
 - *Any other motivated impact*
- (2)
- 3.4 3.4.1 SMTP ✓
- (1)
- 3.4.2 HTTP/HTTPS ✓
- (1)
- 3.5 GPS tracking makes it possible to track our location by tracking the mobile devices that we use✓. This makes it possible to:
- Locate people/friends in your vicinity ✓
 - Point out services/places near you✓
 - Make service interactive based on tracking, etc.
- (3)

- 3.6 3.6.1 *Any TWO reasons ✓✓*
- Employees that are working remotely may need to access to software or data.
 - An employee unable to physically be at the organisation is still able to work. (2)
- 3.6.2 *Any ONE ✓*
- Remote desktop access
 - A dedicated line (1)
- 3.7 3.7.1 Voice over Internet Protocol ✓ (1)
- 3.7.2 VoIP uses data which is more cost-effective than a traditional phone call which is billed by the service provider for the amount of time that the call takes. ✓ (1)
- 3.8 3.8.1 The website address will begin with HTTPS. ✓
The browser will display a lock symbol in the address bar. ✓ (2)
- 3.8.2 The public key is sent to the user's browser and is then used to encode✓ the generated session key. The private key is the only key that can decode✓ the message and is retained on the secure server✓ and never transmitted across the network (3)
- TOTAL SECTION C: 28**

SECTION D: DATA AND INFORMATION MANAGEMENT

QUESTION 4

- 4.1 4.1.1 Data integrity refers to the data reliability in terms of keeping it in its original unchanged form. ✓ Data validity means that data matches a set of rules that apply to it. ✓ (2)
- 4.1.2 Any ONE ✓
- Date: Between 2011/01/01 AND 2011/03/31
 - Checking format against a required standard like DD/MM/YYYY
 - Any other valid example (1)
- 4.2 4.2.1 Any TWO ways ✓✓
- Track buying trends of customers
 - Determine which products are most popular
 - Determine which times are the best sale periods (2)
- 4.2.2 Any ONE ✓
- The server will have a very large amount of secondary storage.
 - The server will have a more powerful processor (1)
- 4.3 4.3.1 To Uniquely identify ✓ each record in a table. ✓ (2)
- 4.3.2 ParentID – tblOrders ✓ (Table MUST be included) (1)
- 4.3.3 Select the fields from the tblParents and tblOrders table by joining the ParentID fields in both tables ✓ and checking where they are the same. Then display only the orders for the relevant parent by matching a field in the tblParents table. ✓
- OR**
- Link the two tables on the ParentID fields in both tables✓, now retrieve all the orders from the tblOrders where the two ParentID fields are the same✓. (2)
- 4.3.4 (a) MIN ✓ (1)
- (b) SELECT ✓ FirstName, Surname ✓FROM tblParents ✓ (3)
- (c) SELECT COUNT(*)✓✓FROM tblOrders ✓
- OR** Count any field name (3)
- (d) INSERT ✓ INTO ✓ tblParents (FirstName, Surname, DateOfBirth) ✓ VALUES ✓ ('John', 'Smith', #20/10/1975) ✓ (5)

TOTAL SECTION D: 23

SECTION E: SOLUTION DEVELOPMENT

QUESTION 5

- 5.1 5.1.1 Any TWO design requirements ✓✓
- Help and documentation should be available
 - Consistent design across all forms
 - Form should have a logical layout
 - Correct format for input should be indicated (2)
- 5.1.2 Any TWO properties
- The message should clearly specify the error✓
 - The message should give advice on action to take as a result of the error – how to solve the error✓
 - The message should be polite/friendly/respectful. (2)
- 5.1.3 Any TWO types ✓✓
- Normal data
 - Extreme data
 - Abnormal data (2)
- 5.2 5.2.1 Any ONE advantage ✓
- Code is easier to modify and maintain/modularity.
 - Code can easily be reused in other programs/extendability. (1)
- 5.2.2 Encapsulation allows the hiding of the internal representation ✓ of an object as not to be visible/available from outside of the object's definition. ✓ (2)

5.3

	Total	LoopCounter
1	0	0
2	5	1 ✓
3	13	2 ✓
4	17	3 ✓

- 5.4 5.4.1 Parameter ✓ (1)
- 5.4.2 To return a representation of an object ✓ including all the attribute values of the object, as a single string. ✓

OR

Combining all the attribute values of the object to be returned as a single string (2)

- 5.4.3 The constructor instantiates an object ✓ and provide the object with the specific attribute value (IDnumber). ✓ (2)

5.4.4 To protect the attributes from being directly manipulated ✓from outside the object. ✓ Mutator and accessor methods are used to change the values of attributes. (2)

5.5 5.5.1 Wage = HoursWorked x 40 ✓
else ✓
Wage = HoursWorked x 30 ✓

OR

Wage = HoursWorked x 40 ✓
IF WorkerCode First Character = T ✓
Wage = HoursWorked x 30 ✓ (3)

5.5.2 In line 8 ✓ the loop should start at 1 and not 0 ✓ (2)

TOTAL SECTION E: 24

SECTION F: INTEGRATED SCENARIO

QUESTION 6

- 6.1 6.1.1 2 GB RAM ✓ will not be sufficient because the server needs sufficient primary memory to process multiple applications ✓ on the server without relying on virtual memory.

OR

The RAM is too small ✓ and will decrease processing speed due to excessive use of virtual memory ✓ (2)

- 6.1.2 (a) RAID 1 creates a mirror of data ✓ for redundancy while RAID 5 stripes data across multiple drives with parity for redundancy. ✓
OR RAID 1 duplicates all data onto a second disk ✓, while RAID 5 uses multiple disks (3 or more) and spreads data over disks ✓ with parity added for redundancy (2)

(b) RAID 1 ✓ (1)

(c) With only 2 drives RAID 5 is not possible. ✓ (1)

- 6.1.3 (a) Dividing a hard disk into multiple logical partitions ✓ that are then used as independent drives ✓. (2)

(b) *Any ONE* ✓
 • A partition can be formatted without affecting other data.
 • Different operating systems can be installed on different drives.
 • Data can be retained on one drive while software is reinstalled on the other. (1)

- 6.1.4 (a) Recently used instructions and instructions that are most likely to be needed next are stored in high speed cache memory ✓ to alleviate the bottleneck of retrieving data and instructions from slower RAM memory. ✓ (2)

(b) Web page files are stored on the hard disk ✓ so that they do not need to be retrieved through the Internet connection each time they are needed which increases the speed ✓ at which visited web pages can be viewed. (2)

- 6.2 Security can be centrally managed. ✓
 Data and applications can be centralised on a server. ✓ (2)

- 6.3 6.3.1 Unsolicited email ✓ sent with the intention of trying to convince the receiver to purchase a product or visit a website. (1)
- 6.3.2 *Any TWO ways ✓✓*
- Ask the ISP to filter spam e-mail.
 - Make use of spam filter software.
 - Increase spam settings on e-mail client program. (2)
- 6.3.3 Spyware is software that installs itself on a system without the user's knowledge✓ and then aids in gathering information about a person or organisation that is then sent✓ to somebody else. (2)
- 6.3.4 *Any TWO ✓✓*
- An infected attachment via e-mail.
 - Visiting an infected website.
 - Using unsafe software – normally in freeware/shareware/pirated software (2)
- 6.4 6.4.1 All users can interact via audio and video from remote locations. ✓ (1)
- 6.4.2 Audio and video data transfer is bandwidth and data intensive ✓ and this will be very expensive as cellular data is very costly. ✓ (2)
- 6.5 6.5.1 A troll is a person who sows discord on the Internet by starting arguments or upsetting people for no reason but their own pleasure. ✓ (1)
- 6.5.2 Post regular positive comments and exciting information. ✓ Remove and ban negative users and comments. ✓ (2)
- 6.6 6.6.1 The devices are not in the control of the organisation and so they can bring in foreign data and programs which could contain malware. ✓ These devices are also not bound to a system policy and so users could remove data from the organisation without permission. ✓ (2)
- 6.6.2 *Any TWO ✓✓*
- Put effective policies in place to which all employees are bound.
 - Ensure that devices match the security requirements for the organisation.
 - Ensure that operating systems and anti-virus programs on employee devices are up to date
 - Require malware scanning of devices before use on the network (2)

- 6.7 6.7.1 A method of gaining access to an organisation's data by inserting additional SQL code ✓ into website forms, in order to steal or damage data. (1)
- 6.7.2 SQL code should not be passed directly to the database. ✓ Only values should be passed directly. Input should be properly validated before being passed to the database. ✓ (2)
- 6.8 6.8.1 Information overload/finding what you are looking for in all the information available ✓ (1)
- 6.8.2 *Any TWO of the following* ✓✓
- Cross-check with other websites.
 - Check that the information is from a well-known, dependable institution/site.
 - Check that the information is up to date.
 - Check that the information is based on scientific research and is not just an opinion.
 - Check whether the author is reputable. (2)
- 6.8.3 Participants might end up simply using a global common viewpoint, instead of arguing their own principles and beliefs. ✓✓
- OR**
- Participants may be exposed to and adopt political and social views that are not necessarily seen as been acceptable in their own country. ✓✓
- OR**
- Any other valid and motivated answer.* ✓✓ (2)

TOTAL SECTION E: 40
GRAND TOTAL: 150