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 *Any TWO* ✓✓
- 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 *Any ONE* ✓
- 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 *Any TWO relevant advantages* ✓✓
- 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✓
- 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 ParetID 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/extendibility. (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 ✓

(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 need not 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