basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

**NATIONAL
SENIOR CERTIFICATE**

GRADE 12

INFORMATION TECHNOLOGY P2

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MEMORANDUM

MARKS: 150

This memorandum consists of 13 pages.

SECTION A: SHORT QUESTIONS

QUESTION 1

1.1.1 Internet Service Provider ✓ (1)

1.1.2 Green computing ✓ (1)

1.1.3 Normalisation ✓ (1)

1.1.4 Firmware ✓ (1)

1.1.5 FTP – file transfer protocol ✓ (1)

1.1.6 Compiler ✓ (1)

1.1.7 Artificial Intelligence ✓ (1)

1.1.8 System clock ✓ (1)

1.1.9 Push technology ✓ (1)

1.1.10 Foreign/Secondary key ✓ (1)

1.2.1 B ✓ (1)

1.2.2 D ✓ (1)

1.2.3 B ✓ (1)

1.2.4 D ✓ (1)

1.2.5 A ✓ (1)

TOTAL SECTION A: 15

SECTION B: SYSTEM TECHNOLOGIES

QUESTION 2

2.1   2.1.1   ROM – stores the BIOS which is needed to start up the computer ✓   (1)

       2.1.2   RAM – all data and instructions have to be loaded in RAM before the CPU can work with them ✓   (1)

2.2   *Any ONE advantage of a touch screen monitor:* ✓
- Can be used as an alternative input device
- Can use gestures (touch) to control the computer, e.g. easy to zoom in and out/to scroll up and down OR Easy to use, with acceptable example
- Used as input and output (save space)

NOTE: Do not accept 'save space' or 'easy to use' without a suitable example.   (1)

2.3   *Any ONE disadvantage for using HDD in laptop:*✓
- More susceptible to damage because of moving parts
- Physical dimensions are larger
- Uses more electrical power – huge drain on battery power
- It is slower than an SSD

NOTE: Do not accept only 'slower'. The speed should be compared to that of SSD.   (1)

2.4   2.4.1   *Any TWO memory management functions of operating system:* ✓✓
The operating system:
- ensures that the same area of memory is not used by programs at the same time so that data/instructions are not corrupted.
- allocates memory to programs as required
- makes memory available that is no longer being used.   (2)

       2.4.2   *Any TWO other functions of operating system (except memory management)* ✓✓
- Provides GUI
- Process and task management/manages the CPU
- Input/output management
- Disk management
- Security   (2)

2.5   *Any ONE reason why new portable drives are preferred over CDs/DVDs:* ✓
- Ultra-notebooks to be slim and light in weight
- Faster data transfer rates than CD/DVD
- Larger storage capacities

Any other valid reason   (1)

2.6   To be able to plug in a cable to allow the computer to connect to the network✓   (1)

2.7   *Any ONE effect a separate graphics processor has on laptop*: ✓
- Speed up the processing by allowing the CPU to spend time on its own tasks and not on the graphics
- Makes laptop more suitable for gaming
- Could lead to faster battery drain   (1)

2.8   2.8.1   Send an (hardware) interrupt ✓   (1)

       2.8.2   The operating system detects the device ✓ and automatically loads the drivers. ✓
                OR
                The device makes itself known to the operating system, which then automatically configures the device for use.   (2)

2.9   2.9.1   *Purpose of cache memory:*
                Concepts:
                - temporary storage ✓
                - to prevent the slowing down of processing ✓
                Any ONE:
                - to temporary store data and instructions that are most likely to be needed next by the processor
                - to make data and instructions available from a faster medium to the CPU, rather than fetching from the slower RAM
                - to prevent the slower RAM (process of fetching from RAM) from slowing down the processing speed of the CPU.   (2)

       2.9.2   *Disk caching: Concepts:*
                - built-in RAM used for storing data ✓
                - fast access to recently used files ✓
                Any ONE of:
                - Every hard drive has a certain amount of RAM cache built into it and it's used to cache data that has recently been read from disk.
                - A small amount of high speed memory build into every hard drive, used to cache data read from the (slower) disk and thereby speeding up subsequent calls for the same files/data.   (2)

2.10   2.10.1   Utility software are programs/applications ✓ that perform routine maintenance and administration tasks in a computer system. ✓   (2)

       2.10.2   Defragmenter ✓   (1)

2.11   *Virtual memory*:

       Concepts:
- Reserved area on HDD used as RAM ✓
- Parts of program not being used are moved to virtual memory (HDD) ✓
- Easily fetched again when needed ✓

OR
- When the RAM is full, the operating system will use a reserved part of the hard drive as RAM.
- Only the main part of the program is loaded into RAM and the parts not presently being used are stored on the hard disk.
- As parts of a program are needed they are loaded from the reserved section on the HDD into RAM.   (3)

TOTAL SECTION B: 24

SECTION C: COMMUNICATION AND NETWORK TECHNOLOGIES

QUESTION 3

3.1   3.1.1   Provide users with access to files stored on it ✓ (1)

       3.1.2(a)   The physical layout/connection of the computers in a network. ✓ (1)

       3.1.2(b)   *Any TWO* ✓✓
- Easy to add nodes
- Easy to troubleshoot
- Failure of a device will not influence the rest of the network as all computers are individually connected to a central hub/switch (2)

       3.1.2(c)   Switch ✓ (1)

       3.1.3   *Any ONE* ✓
The NIC:
- allow communication with other computers over the network
- encode/decode the data so that it can be sent/received (1)

       3.1.4   (a) An IP address is a numerical address that uniquely identifies a computer on a network/Internet. (1)

                 (b) If two computers have the same IP address, a conflict will occur and the network operating system will be unable to connect those two computers to the network. (1)

3.2   3.2.1   Refers to the limited amount of data that can be downloaded per month using the ADSL line. ✓ (1)

       3.2.2   Refers to the data transfer rate – the total amount of data that can be carried from one point to another in a given time period ✓ (1)

3.3   3.3.1   Low bandwidth with many users connected to one access point ✓ which results in poor access speed. ✓ (2)

       3.3.2   Cost for data will be much more expensive ✓ (1)

3.4   3.4.1   *Any TWO advantages of online storage:* ✓✓
- Saves hard disk space
- Access to data anywhere/anytime
- Can access data from multiple devices
- Limited free storage space
- Can share files with others (2)

	3.4.2	Data synchronisation ✓	(1)
3.5	3.5.1	A set of rules for encoding and decoding for transmission across a network.✓	(1)
	3.5.2	• POP3 refers to the most common protocol used for downloading e-mail ✓ from POP3 servers via the Internet • SMTP refers to the most common protocol used for sending ✓ e-mail from SMTP servers via the Internet	(2)
	3.5.3	*Any TWO* ✓✓ • A fast Internet connection is required • Call quality may be poor with a slow Internet connection • Data cap could be used up quickly/expensive if using video	(2)
3.6	3.6.1	Antivirus ✓	(1)
	3.6.2	Firewall✓	(1)
	3.6.3	UPS ✓	(1)
	3.6.4	Encryption ✓	(1)

TOTAL SECTION C: 25

SECTION D: DATA AND INFORMATION MANAGEMENT

QUESTION 4

4.1　　4.1.1　　Currency/Double ✓ (1)

4.1.2　　Concepts: One department ✓ can have many types of items.✓
Specific example: department D12(Afrikaans department) has
desktop computers and printers (2)

4.1.3 (a)　SELECT * FROM tblStockItems ORDER BY ItemName
✓SELECT *
✓FROM tblStockItems
✓ORDER BY ItemName (3)

4.1.3 (b)　UPDATE tblStockItems SET ItemQuantity = ItemQuantity + 1,
WHERE DepartmentID = 'D12' AND ItemName = 'Printer HP
F370M '
✓ UPDATE tblStockItems
✓ SET ItemQuantity = ItemQuantity +1,
✓ DepartmentID = 'D12 AND
✓ ItemName = 'Printer HP F370M'　(Or ItemID = 'C5') (4)

4.1.3 (c)　SELECT DepName, Sum(ItemQuantity * ItemCost) AS TotalValue
FROM tblStockItems, tblDepartment
WHERE　　tblStockItems.　DepartmentID=　　tblDepartment.
DepartmentID GROUP BY DepName
✓ SELECT DepName,
✓ Sum(ItemQuantity * ItemCost)
✓ AS TotalValue
✓ FROM tblStockItems, tblDepartment✓WHERE
 tblStockItems.DepartmentID = tblDepartment.DepartmentID
✓ GROUP BY DepName (6)

4.1.4　　SELECT ItemName, ItemQuantity FROM tblStockItems
WHERE ItemName LIKE ✓ %Laptop% (2)

4.2   4.2.1   Database management system ✓   (1)

       4.2.2   Any TWO ✓✓
                • Create
                • Edit
                • Add
                • Delete
                • Query
                • Process   (2)

4.3   4.3.1   Any TWO ✓✓
                • Slow access due to high network traffic because of the high
                  volume of data
                • High data charges due to large amounts of data being
                  communicated
                • Risk of entire system coming to a standstill if single server fails.   (2)

       4.3.2   • Duplication
                • Partitioning   (2)

       4.3.3   Dependant transactions are grouped ✓ and the complete
                transaction is only processed if all individual transactions were
                successful ✓   (2)

                                                    TOTAL SECTION D: 27

SECTION E: SOLUTION DEVELOPMENT

QUESTION 5

5.1   Loop row from 1 to 4 ✓
           Loop col from 1 to 4 ✓
           arrStock[row,5 ✓] ← arrStock[row,5] ✓ + arrStock[row,col] ✓
       OR
       Loop row from 0 to 3 ✓
           Loop col from 0 to 3 ✓
           arrStock[row,4 ✓] ← arrStock[row,4] ✓ + arrStock[row,col] ✓
       OR
       Loop row 1 → 4 ✓
          total ← 0 ✓
          Loop col 1 → 4✓
              total ← total + arrStock[row,col] ✓
          arrStock[row,5] ← total ✓   (5)

5.2   5.2.1(a)   Syntax ✓   (1)

          5.2.1(b)   Logical ✓   (1)

          5.2.1(c)   Runtime ✓   (1)

          5.2.2   *Any TWO* ✓✓
- The number of arguments (actual parameters) must match the number of (formal) parameters
- The type of arguments (actual parameters) must match the type of (formal) parameters
- The order of the arguments (actual parameters) must match the order of the (formal) parameters   (2)

5.3   5.3.1   Open the text file **StockDetails** for reading
                 Counter ← 0
                 Loop until the end of the **StockDetails** text file
                    Read one line of text ✓
                    Test if the line contains the word **Tablet** ✓
                       Increment Counter ✓
                       Copy text up to ';' and store in room number array✓
                       Copy text after #; and store in quantity array✓
                 End loop
                 Close text file ✓   (6)

          5.3.2   The path was incorrectly specified ✓
                 OR
                 The text file was not available in the working folder   (1)

5.4   **JAVA solution**

number of values	j	loop counter	k	j modulus 2 = 0?	arrNumbers [loop counter]	
4	1	0	1		5	✓
				No		✓
	2	1	4		8	✓
				Yes	2	✓
	3	2	9		13	✓
				No		
	4	3	16		20	✓
				Yes	4	✓
5						✓

DELPHI solution

number of values	j	loop counter	k	j modulus 2 = 0?	arrNumbers [loop counter]	
4	1	1	1		5	✓
				No		✓
	2	2	4		8	✓
				Yes	2	✓
	3	3	9		13	✓
				No		
	4	4	16		20	✓
				Yes	4	✓
5						✓

(8)

TOTAL SECTION E: 25

SECTION F: INTEGRATED SCENARIO

QUESTION 6

6.1   6.1.1   *Any TWO* ✓✓
- Biometrics
- Passwords and usernames
- Security cards with microchips   (2)

6.1.2(a)   To decrease the size of the video file for faster file transfer ✓ and to reduce the amount of storage space needed ✓   (2)

6.1.2(b)   Losing some of the insignificant detail of the file ✓   (1)

6.1.3(a)   An audit trail is a record showing tracked information✓   (1)

6.1.3(b)   *Any TWO* ✓✓
- Stock item
- Date of issuing and returning items
- Person receiving and returning item

Any other acceptable valid example   (2)

6.2   6.2.1   Encryption is when data is converted into an unreadable format ✓ by using a set of rules ✓or an algorithm.   (2)

6.2.2   Public key is used to encrypt a message ✓ and the private key is used to decrypt the message ✓
The private key is retained by one site while the public key is passed across the network to the party who wants to establish a secure connection ✓   (3)

6.3   6.3.1   VPN ✓
Remote desktop ✓   (2)

6.3.2   An intranet is a private network that offers restricted access to members of an organisation; this can be used for the school staff members. ✓

An extranet is used when users from outside an organisation like the security company are allowed access to information using passwords and user names. ✓   (2)

6.4   *Any TWO* ✓✓
- Change the brightness settings of the display
- Close unnecessary apps running in the background
- Turn off Bluetooth/Wi-Fi
- Turn off GPS/Turn off location based apps   (2)

6.5   6.5.1   RFID uses radio waves ✓ to identify objects/tags over a distance ✓   (2)

       6.5.2   *Any TWO* ✓✓
- Tag can be read even when hidden from view
- Can read more than one tag at a time
- No physical handling of items required
- Accurate data recording   (2)

6.6   6.6.1   Radio wave connection ✓ that is able to transfer data over short distances ✓   (2)

       6.6.2   *Any ONE* ✓
- Easy to set up
- Most mobile devices has built in Bluetooth facilities
- No need to transfer data over long distances   (1)

6.7   6.7.1   A service available on the Internet ✓   (1)

       6.7.2   Do not provide the service yourself ✓ but pay someone else to do it. ✓   (2)

       6.7.3   *Any TWO* ✓✓
- No need to purchase software for the server as it is part of the service
- Do not need to employ skilled people to administer the server
- Save on hardware – do not have to purchase dedicated computer   (2)

       6.7.4   Virtualisation ✓   (1)

       6.7.5   *Database administrator*
Any TWO ✓✓
- Security
- Backup and restoration plans and policies
- Monitoring the performance of the database
- General maintenance of the database   (2)

TOTAL SECTION E: 34
GRAND TOTAL: 150