



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

SENIOR CERTIFICATE EXAMINATION

INFORMATION TECHNOLOGY P2

2015

MEMORANDUM

MARKS: 150

This memorandum consists of 14 pages.

SECTION A: SHORT QUESTIONS

QUESTION 1

- | | | |
|------|-----|-----|
| 1.1 | C ✓ | (1) |
| 1.2 | E ✓ | (1) |
| 1.3 | H ✓ | (1) |
| 1.4 | N ✓ | (1) |
| 1.5 | F ✓ | (1) |
| 1.6 | A ✓ | (1) |
| 1.7 | M ✓ | (1) |
| 1.8 | G ✓ | (1) |
| 1.9 | B ✓ | (1) |
| 1.10 | K ✓ | (1) |

TOTAL SECTION A: 10

SECTION B: SYSTEM TECHNOLOGIES**QUESTION 2**

- 2.1 2.1.1 *Any TWO ✓✓*
- Provides an interface
 - Manages processes and tasks
 - Manages memory
 - Manages input and output
 - Manages secondary memory/storage (2)
- 2.1.2 *Any ONE ✓*
- Fix software bugs
 - Add in features
 - Improve security
 - Improve performance (1)
- 2.1.3 The operating system reserves an area on the hard drive which is then used as virtual RAM/memory. ✓
Pages are swapped between physical RAM and the hard drive as needed. ✓ /Content not being used is moved from RAM to virtual memory/HD.
Concepts:
Space on hard drive – 1 mark
Explanation of process – 1 mark (2)
- 2.1.4 The RAM is limited by the amount of memory which the operating system ✓ can address ✓ /or make use of
OR
A 32-bit operating system can only address 4 GB of RAM, anything more requires a 64-bit operating system (2)
- 2.1.5 *Any TWO ✓✓*
- Portability/Do not have to carry around extra devices
 - All essential components are integrated in one casing/compact
 - Battery power available in case of power failure (2)
- 2.1.6 *Any ONE ✓*
- Can interface with computer/tablet/smartphone
 - Remote control of other devices
 - Receive notifications/accessing material on other devices
 - Monitoring health (1)
- 2.2 2.2.1 *Any ONE ✓*
- Bluetooth is wireless connection and Ethernet is a cabled network
 - Ethernet has a faster data transfer speed
 - Ethernet has a longer range (1)
- 2.2.2 500 GB ✓ (1)

- 2.2.3 (a) Solid State Drive/disk ✓ (1)
- (b) Any TWO ✓✓
- No movable parts/Robust
 - Faster access speed
 - Energy saving
 - Lighter in weight
 - Smaller dimensions (2)
- 2.2.4 Any ONE ✓
- Finger print scanner
 - Iris scanner
 - Voice activation
 - Facial recognition (1)
- 2.3 2.3.1 (a) There are currently 698 active/multiple threads running. (1)
- (b) One program is broken up into independent processes ✓ which can be executed simultaneously ✓ (2)
- 2.3.2 To compensate for the loss of efficiency when a faster medium ✓ needs to communicate with a slower medium ✓
OR
Any suitable explanation (2)
- 2.3.3 Explanation: Each task to be executed is allocated a time slice of the CPU ✓
OR
Any suitable example (1)
- 2.4 2.4.1 Any ONE ✓
- USB
 - FireWire
 - Thunderbolt
 - eSATA (1)
- 2.4.2
- Uses multiple disks ✓
 - Then mirrors/copies OR distributes the data across the disks ✓ (2)

TOTAL SECTION B: 25

SECTION C: COMMUNICATION TECHNOLOGIES AND NETWORK TECHNOLOGIES**QUESTION 3**

- 3.1 3.1.1 *Any TWO ✓✓*
- High bandwidth
 - More reliable/consistent transfer speeds
 - Improved security
- (2)
- 3.1.2 *Any TWO ✓✓*
- Susceptible to EMI
 - Crosstalk
 - Distance limitations/attenuation
- (2)
- 3.1.3 (a) Star topology ✓
- (1)
- 3.1.3 (b) *Any TWO ✓✓*
- Easy to troubleshoot
 - Easy to remove one dysfunctional computer and replace it/If one computer does not work, the network is not affected
 - Easy to extend/add more computers
 - Dedicated connection for each device
- (2)
- 3.1.4 *Any ONE ✓*
- Provides access to the files/storage
 - Manages access to resources like network printers
 - Manages security/rights on the network/logon server
- (1)
- 3.2 3.2.1 *Any ONE ✓*
- Connects computer to cabled network/Controls flow of data between computer and cabling system
 - Prepares data to be sent over the cable to another computer
 - Receives incoming data and translates it into understandable data
 - Broadcasts MAC address to receive unique information
- (1)
- 3.2.2 *Any ONE ✓*
- Switch directs traffic between devices connected on the network
 - Connects all devices to a central location so that communication can take place
- (1)
- 3.3 3.3.1 Router ✓ (Also accept modem)
- (1)
- 3.3.2 *Any ONE of ✓✓*
- Many users share the same connection/large amounts of data needs to be transferred over one connection
OR
High speed data transfer will limit time lost waiting for data to be downloaded
- (2)

- 3.4 3.4.1 Any TWO of ✓✓
- Creates/deletes/manages user accounts
 - Updates software
 - Administers network security
- Do not accept: Makes backups (2)
- 3.4.2 Data is stored on servers/computers ✓ on the Internet/in cloud ✓ (2)
- 3.4.3 Any TWO ✓✓
- Synchronising data files across devices
 - Less hardware requirements
 - Access your files anywhere
 - Limited free online storage
 - Backup is automatically off-site (2)
- 3.4.4 Data is changed ✓ into a format so that it is unrecognisable to others✓/so that it cannot be read (2)
- 3.5 3.5.1 Any TWO ✓✓
- The password is too short and should be at least 8 characters
 - Should use a mixture of uppercase and lower case
 - Should include special characters
 - Should not use predictable content like initials and employee numbers (2)
- 3.5.2
- Administrators have full control over the system/can install software and hardware drivers, create and modify user accounts, change all passwords, have full access to all files.
 - Standard users are permitted to log on, make changes to their account, work with files for which they have permission, change their password. Cannot make system changes.
- Concepts:
Software management ✓
Management of user accounts/rights ✓ (2)
- TOTAL SECTION C: 25**

SECTION D: DATA AND INFORMATION MANAGEMENT

QUESTION 4

4.1 4.1.1 Any ONE ✓

- Insert
- Update
- Delete

(1)

4.1.2 Concepts

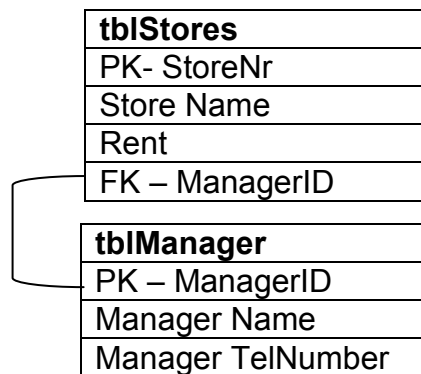
- Create more tables ✓
- Specify key fields in each table ✓
- Joined in a correct relationship on the ManagerID field ✓

Alternative 1

Using the given database: The store managers, store names, contact numbers and department fields all have repeating data. Create separate tables (e.g. one for stores and one for managers), each with their own primary key and link these tables in a relationship using the ManagerID.

Alternative 2

Use a diagram to show the bulleted concepts above



(3)

- 4.2 4.2.1 (a) SELECT ExtensionNum, ManagerName FROM tblDepartments
ORDER BY ExtensionNum
✓ SELECT ExtensionNum, ManagerName
✓ FROM tblDepartments
✓ ORDER BY ExtensionNum (3)
- 4.2.1 (b) SELECT Surname, Name, (Salary*1.085) AS NewSalary FROM
tblEmployees WHERE DepID = "T1"
✓ SELECT Surname, Name
✓ Salary*1.085 - Calculation of new salary
✓ AS NewSalary
✓ FROM tblEmployees
✓ WHERE DepID = "T1" (5)
- 4.2.1 (c) SELECT Surname, Name FROM tblEmployees, tblDepartments
WHERE (tblEmployees.DepID = tblDepartments.DepID) and
(ManagerName = "J Zwane") and (Salary > 3000)
✓ SELECT Surname, Name (Accept if salary also displayed)
✓ FROM tblEmployees, tblDepartments
✓ WHERE tblEmployees.DepID = tblDepartments.DepID
(Also accept inner join/left join)
✓ AND ManagerName = "J Zwane"
✓ AND Salary > 3000 (6)
- 4.2.2 UPDATE tblEmployees SET DepID = 'T2' where EmpID = "B124"
✓ UPDATE table instead of SELECT
✓ where clause – EmpID ="B124" (2)
- 4.3 4.3.1 A distributed database is a system where parts of the database are
spread across servers ✓ in different locations. ✓ (2)
- 4.3.2 Any TWO ✓✓
 - To avoid slow network traffic because of high volumes of data
 - To avoid high costs for transferring large amounts of data
 - To avoid the risk of entire business shutting down if there are problems with a centralised database
 - Not all processes/individual trade need to be synchronised on a continuous basis
(2)
- 4.4 4.4.1 An audit trail keeps track of who/what made changes ✓ to the
database and when the changes were made. ✓ (2)
- 4.4.2 Any ONE ✓
 - The performance of the database is slowed down.
 - Large amounts of data needs to be stored
(1)

TOTAL SECTION D: 27

SECTION E: SOLUTION DEVELOPMENT

QUESTION 5

5.1 5.1.1 Private attributes are protected against unintentional modification ✓
OR
Prevents access to private attributes by other class (1)

5.1.2 (a) Any TWO ✓✓
 • Check that all characters are digits
 • Check the length of the strings (telephone number must be 10 digits and ID must be 13 digits)
 • One specific check that can be tied to the format of the telephone number
 • One specific check that can be tied to the format of the identity number (2)

5.1.2 (b) Although the data entered will be valid according to the checks, the specific telephone number or identity number may not be that person’s telephone number or identity number ✓ (1)

5.2 5.2.1

K	M	L	L=K?	M=1?	Output
15					
	7				
		14			
			No		
	6				
				No	
		12			
			No		
	5				
				No	
		15			
			Yes		
					5 is the largest factor of 15

Allocate 1 mark for each correct set of statements as indicated by the brackets(}) ✓✓✓✓✓ (5)

- 5.2.2 Mark allocation
- ✓ input
 - ✓ loop structure/ replace all
 - ✓ checking 'e' or 'E'
 - ✓ replacing 'e' or 'E' with asterisk (*)
 - ✓ otherwise keep original character
 - ✓ display both words

Example of pseudo code

Enter the word

Loop/repeat from 1 to length of word

If the character at loop counter position = 'e' or 'E' then

modword \leftarrow modword + '*'

Otherwise

modword \leftarrow modword + character at loop counter position

Display word and modword

(6)

- 5.2.3 Mark allocation
- ✓ initialise a variable to keep highest value
 - ✓ outer loop
 - ✓ initialise booked seats counter
 - ✓ inner loop
 - ✓ if seat is not blank/booked
 - ✓ increment booked seats counter
 - ✓ if seats booked are more than highest value
 - ✓ store row number
 - ✓ change highest value to seats booked in this row
(Last two statements can be in any order)

Example of pseudo code

highest \leftarrow 0

loop/repeat row from 1 to 20 (number of rows)

seats booked \leftarrow 0

loop/repeat seat from 1 to 30 (number of seats per row)

if array[row,seat] \neq " " then

increment number of seats booked

if seats > high then

rownumber \leftarrow row

highest \leftarrow number of seats booked

(Last two statements can be in any order)

Penalise if not nested/indented correctly

(9)

TOTAL SECTION E: 24

SECTION F: INTEGRATED SCENARIO**QUESTION 6**

- 6.1 6.1.1 Radio waves/Microwaves ✓ (1)
- 6.1.2 Send and receive signals ✓ (1)
- 6.1.3
- Signals can be weakened by structures such as walls/wider coverage
 - Many users share one access point which decreases the bandwidth available to each user
- (2)
- 6.2 6.2.1 The operating system is designed to keep the device on and working at all times as it is performing tasks in the background even when the screen is dark.
Concepts:
Operating system continues to function ✓
Different tasks/apps still running ✓ (2)
- 6.2.2 *Any TWO* ✓✓
- Set screen to switch off automatically when not in use/power management
 - Close applications that are not used
 - Turn off GPS
 - Turn off Wi-Fi/Bluetooth
 - Do not play media files for longer than necessary on speaker rather use ear phones
- (2)
- 6.2.3 Android operating system (1)
- 6.2.4 *Any ONE* ✓
3G/4G/LTE/HSDPA/Edge (1)
- 6.3 6.3.1 To make the tenants aware of
- the expected behaviour ✓ while using the network and Internet and
 - consequences of incorrect behaviour ✓
- (2)
- 6.3.2 *Any TWO* ✓✓
- Code of conduct educating tenants on the use of the network and Internet
 - List of consequences for violating conditions
 - When and where to use own mobile devices
 - Restrictions about installing hardware and software
 - Procedures to follow if they are victims of cyber crime
 - Hints to avoid plagiarism
 - Any other suitable example
- (2)

- 6.3.3 *Any TWO ✓✓*
- Https in the URL
 - Padlock in the browser
 - Check the digital certificate of the website
- (2)
- 6.4 A private network/network within an organisation ✓ consisting of documents and resources made available on a web like interface ✓
- (2)
- 6.5 6.5.1 *Any TWO ✓✓*
- Collect information about the items/discounts/sale items
 - Speed and ease of use/stock control
 - Read tags even if hidden/out of sight but still in range/
 - Prevention of theft/security
 - Do not physically have to handle merchandise
 - Reading tags leads to faster access control
 - No errors in data capturing
- (2)
- 6.5.2 *Any ONE ✓*
- Buying with credit card/loyalty card
 - Location based computing/Browsing patterns being monitored on the web
 - Paying with smartcards
 - Security videos
- (1)
- 6.6 6.6.1 *Any ONE ✓*
- Exposure/Advertising
 - Attract customers locally and internationally
 - Could add blog/forums
 - Online up to date information about the mall
 - Feedback/comments from customers
 - Links to social media
 - Any other suitable example
- (1)
- 6.6.2 Static – display of content does not change ✓ – mostly aimed at information
Dynamic – page layout/content change depending on your individual preferences ✓
- (2)
- 6.6.3 RSS feeds
- (1)

6.6.4 (a) *Any TWO ✓✓*

- Change privacy settings to allow certain people access
- Befriend only those known to you/take care who you befriend
- Keep private information confidential/do not share private information that could be used against you/negatively

Concepts:

What information is shared

Who the information is shared with

(2)

6.6.4 (b)

- Can be directed to the nearest ATM/coffee shop/bank, etc. ✓
- Information can be provided on stores/specials/offers in the immediate vicinity ✓

(2)

6.6.5 Digital certificate ✓

(1)

6.7

6.7.1 *Any TWO ✓✓*

- Do not need very large hard drive – do not have to store the program files
- Do not require a specific platform
- Some applications are free/do not have to buy a license/can rent software
- Online storage of data files
- Access anywhere/anytime
- Online collaboration on projects/documents
- Outsourcing of software and upgrades/always have latest version of software

(2)

6.7.2 *Any ONE ✓*

- Need a continuous Internet connection
- Security risks
- Only available as long as providing company is in business
- Only available while you are paying rent
- Data costs

(1)

6.8 *Any TWO ✓✓*

- Generate electronic statements/receipts
- Use energy efficient products
- Refill/Re-use ink/toner cartridges
- Turn off computers/screens when not in use
- Recycle old/broken computer components
- Send e-waste to disposal companies
- Do not print unnecessarily
- Communicate/advertise electronically
- Any other valid example

(2)

- 6.9 6.9.1 Malware is malicious software ✓ designed to negatively affect the functioning of the computer. (1)
- 6.9.2 *Any TWO* ✓✓
- Anti-virus program reports virus detected
 - Error messages pop-up
 - Files start disappearing
 - Computer slows down dramatically
 - Free space is reduced
 - Computer no longer boots up
 - Any other valid example (2)
- 6.10 *Any ONE* ✓
- VPN
 - Remote desktop connection (1)
- TOTAL SECTION E: 39**
GRAND TOTAL: 150