



# basic education

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Department:  
Basic Education  
**REPUBLIC OF SOUTH AFRICA**

## **SENIOR CERTIFICATE EXAMINATIONS**

**INFORMATION TECHNOLOGY P2**

**2017**

**MARKING GUIDELINES**

**MARKS: 150**

**These marking guidelines consist of 12 pages.**

**SECTION A: SHORT QUESTIONS****QUESTION 1**

1.1	1.1.1	D ✓	(1)
	1.1.2	B ✓	(1)
	1.1.3	D ✓	(1)
	1.1.4	B ✓	(1)
	1.1.5	D ✓	(1)
1.2	1.2.1	CAP/Data bundle ✓	(1)
	1.2.2	Blog/Weblog ✓	(1)
	1.2.3	Cracker/Hacker ✓	(1)
	1.2.4	DNS (Domain Name System) ✓	(1)
	1.2.5	HTTPS/SSL ✓	(1)
	1.2.6	Flashing ✓ the ROM	(1)
	1.2.7	Instant messaging (IM) ✓	(1)
	1.2.8	MP3 (MPEG-1 Audio Layer 3) ✓	(1)
	1.2.9	Piggybacking ✓	(1)
	1.2.10	POST (Power-on-self-test) ✓	(1)

**TOTAL SECTION A: 15**

**SECTION B: SYSTEMS TECHNOLOGIES****QUESTION 2**

- 2.1 *Any TWO reasons for using thin clients: ✓✓*
- Less hardware required making it cheaper/Do not need very powerful hardware as processing is done by server
  - Less physical space required
  - Software only needs to be installed on server/Programs are loaded onto and shared from server
  - Reduced security threat (2)
- 2.2 2.2.1 On the ROM chip ✓ (OR another type of ROM) (1)
- 2.2.2 *Any TWO functions of BIOS: ✓✓*
- Check that all hardware is connected and in working order/POST
  - Provide user with a menu of setup options for configuration at lowest level/CMOS settings
  - Locate and load operating system
  - Controls hardware at low level (2)
- 2.3 2.3.1 Multiprocessing ✓ (1)
- 2.3.2(a) The main aim is prevent a slower medium ✓ from slowing down the performance of the faster medium. ✓ (2)
- 2.3.2(b) Disk caching:  
Every hard drive has built-in fast high speed memory (RAM) ✓ which is used to cache data read from/written to the hard drive and therefore speed up subsequent calls ✓ for the same code/data from the hard drive. (2)
- 2.3.3 *Any ONE: (Naming) ✓ (explanation) ✓*
- Increase RAM/memory – to hold more data and instructions/less use of virtual memory
  - Use an SSD instead of conventional HDD - faster access speeds
  - Better graphics card – faster generation of images and less load on CPU
  - Replace old motherboard with a new board with higher bus speeds – faster data transfer
  - Multi core processor - replacing single core with multi core processor (2)
- 2.4 Converts/translates/changes source code/high level language code ✓ into machine code ✓ that is understandable by the CPU.

**NOTE:**

To create the executable program copy (exe-file) is incorrect as it is not the common task. (2)

- 2.5 Any *TWO* aspects that need consideration: ✓✓
- Compatibility
  - Cost
  - Software requirements
- (2)
- 2.6 2.6.1 Any *TWO* ways of decreasing electricity usage: ✓✓
- Decrease brightness settings of the screen
  - Unplug chargers when not in use
  - Change the balance between power consumption and performance
  - Set devices on sleep/hibernate mode
  - Buy energy efficient devices
- (2)
- 2.6.2 Any *TWO* benefits: ✓✓
- Greater productivity - time is saved by producing electronic documents vs type writers/Electronic communication enhance productivity
  - Information availability – access to current/accurate data/availability of information on the web
  - Fewer employees – will save on payroll expenses
  - Cost saving - do not have to print everything which saves paper
- NOTE:**  
Do not award marks for repetition of the same concept or any reference to use of Internet.
- (2)
- 2.7 2.7.1 Any *TWO* ✓✓  
*Effective backup program includes the following:*
- Create a schedule to backup files/Remember to make regular (daily, weekly and monthly) backups
  - Choosing to only backup files that have changed since last backup
  - Use incremental backup
  - Compressing files to save space on the backup media
  - Do not save the backup on the same computer hard drive
  - Keep your backup media saved preferably off-site
  - Backup only user data as software may be reinstalled
- (2)
- 2.7.2 *Disk fragmentation of hard drive occurs when:* complete computer files are not saved in consecutive clusters on the hard drive✓.
- (1)
- 2.8 Any *TWO* ✓✓
- Small physical dimensions
  - No moving parts/more robust
  - Faster data access
  - Uses less electricity
- (2)

**TOTAL SECTION B: 25**

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

- 3.1 3.1.1 Any TWO ✓✓:
- Easy to install
  - UTP is cheaper than fibre
  - Flexibility (2)
- 3.1.2 Router ✓
- Also accept: Any type of modem (1)
- 3.1.3 Star ✓ (1)
- 3.2 Any TWO advantages using a client-server network: ✓✓
- More sophisticated security
  - Better performance (faster)
  - Large storage on server so other computers on the network do not need a large hard disk
  - More suitable for a large number of/multiple computers/users (2)
- 3.3 3.3.1 Any ONE reason for updated software: ✓
- Fix flaws that make the computer vulnerable to hackers
  - Fix bugs that could cause a loss of data if program crashes
  - Close security loopholes
  - Add new features to existing software (1)
- 3.3.2 Any TWO responsibilities of system administrator: ✓✓
- Make regular backups
  - Create/delete users
  - Manage/monitoring users rights
  - Routine maintenance of files/housekeeping
  - Adding/installing hardware (2)
- 3.4 3.4.1 Password protection: to prevent unauthorized access/changes to the data ✓. (1)
- 3.4.2 Malware is: software that is specifically designed to install itself without the user's knowledge✓ to negatively affect the computer system. ✓
- NOTE** - Do not accept examples. (2)
- 3.4.3 A firewall provides security by monitoring the communication and ports✓ to prevent unauthorised access ✓ through these ports and to the network. (2)

- 3.5 3.5.1 Cookie is a text file ✓ that is saved locally on the hard drive after visiting a web site, with configuration settings reflecting the user's preferences. ✓ (2)
- 3.5.2 A dynamic webpage are created by software running on the webserver each time they are accessed. ✓  
When a dynamic web page is accessed by different users they will see different content. ✓ (2)
- 3.5.3 Cascading style sheet (CSS) contains the formats for how a particular object should be displayed in a Web browser ✓ and therefore the developer does not have to code separate web pages for individual user configurations/preferences ✓ for example: different colour schemes (2)
- 3.5.4(a) Authenticate the identity of the person/organisation/website ✓ (1)
- 3.5.4(b) *Any TWO* ✓✓
- Owners public key
  - Owners name
  - Country of origin
  - Date of issue
  - Expiry date of public key
  - Name of issuer
  - Serial number of certificate
  - Digital signature of issuer (2)

**TOTAL SECTION C: 23**

**SECTION D: DATA AND INFORMATION MANAGEMENT****QUESTION 4**

- 4.1 Oracle ✓ (1)
- 4.2 Any TWO ✓✓  
  - Data integrity
  - Data independence
  - Data security
  - Data redundancy
(2)
- 4.3 4.3.1 *Record* – collection of fields/1 row of data/particulars of an entity ✓ (1)
- 4.3.2 StartDate or EndDate ✓  
Text must change to DateTime data type ✓  
**NOTE:** GuideTelNum cannot be changed (2)
- 4.3.3(a) *Update anomaly:*  
If the telephone number of the tour guide Kajal Singh changes ✓  
the information must be changed in all the records where Kajal Singh is the tour guide. ✓  
  
Concepts:  
  - Telephone number changes
  - Update many records
(2)
- 4.3.3(b) Split the table into more than one table ✓  
Each table must have a primary key ✓  
Create a 1 to many relationship between the tables ✓ (3)
- 4.3.4 All the records ✓ from the table are deleted ✓  
**NOTE:** Do not accept the table is deleted (2)
- 4.4 The data is mirrored/duplicated ✓ in parallel sets of data so that if one set fails the other will be able to be used. ✓ (2)
- 4.5 *Data mining* - Software is used to identify trends/patterns ✓ in the vast amount of data ✓ (2)
- 4.6 A hacker types a SQL statement ✓ in a data field/query parameter instead of the required data. ✓ (2)
- 4.7 4.7.1 Any TWO of: ✓✓  
  - Prevents data traffic congestion on a single server
  - Prevents unnecessary transfer of data
  - System will not be down if a single computer fails
(2)
- 4.7.2 Duplication ✓  
Partitioning ✓ (2)

**TOTAL SECTION D: 23**

**SECTION E: SOLUTION DEVELOPMENT****QUESTION 5**

- 5.1 5.1.1(a) 1) Combo box/List box/Radio group/Radio button ✓  
2) Spin edit/Spinner/Slider ✓  
3) Check box/Combo box/Radio group/Radio button ✓ (3)
- 5.1.1(b) Any TWO ✓✓  
• Client name  
• Date of visit  
• Start Date  
• End date  
• Number of days  
Any other valid example. (2)
- 5.1.2(a) (i) Validate data – The data meets the requirement for a specific format/range/data type ✓  
(ii) Verified data – The user has confirmed that the correct option was selected/correct data was entered. ✓ (2)
- 5.1.2(b) The accommodation can only be selected ✓ from the selection component's list of acceptable values. (1)
- 5.2 5.2.1 *Logical error* – although the program runs when executed ✓ it produces incorrect results/output ✓ (2)
- 5.2.2(a) •  $X \leftarrow \text{counter1}$  ✓  
•  $Y \leftarrow 3$  ✓ OR (Delphi –  $\text{counter2} + 1$ )  
*Also accept:*  
 $\text{arrNumbers}[\text{counter1}, 3] \leftarrow \text{total}$  (2)
- 5.2.2(b) A ✓ (between lines 6 and 7) (1)
- 5.2.3 2 For  $\text{counter2} \leftarrow 1$  to 2 ✓  
3 total  $\leftarrow 0$   
4 For  $\text{counter1} \leftarrow 1$  to 12 ✓  
5 total  $\leftarrow \text{total} + \text{arrVisitors}[\text{counter1}, \text{counter2}]$   
**NOTE:** Ensure that indexes have not been swapped in line 5. (2)
- 5.2.4  $\text{temp} \leftarrow \text{arrVisitors}[5,1]$  ✓  
 $\text{arrVisitors}[5,1] \leftarrow \text{arrVisitors}[5,2]$  ✓  
 $\text{arrVisitors}[5,2] \leftarrow \text{temp}$  ✓ (3)



- 5.3. 5.3.1 Object Oriented Programming ✓ (1)
- 5.3.2 It is used to instantiate an object ✓ (1)
- 5.3.3 The number of days can be calculated ✓ from the other fields/attributes. (1)
- 5.3.4 It is only available in the object class. ✓  
Or  
Not accessible from the driver class or from other classes (1)
- 5.3.5 To change the start date field/attribute ✓ in the object if the original starting date of the booking changed ✓ (2)
- 5.3.6 A toString method is used to combine all the attributes of the object ✓ as a single string ✓ (2)

**TOTAL SECTION E: 26**

**SECTION F: INTEGRATED SCENARIO****QUESTION 6**

- 6.1 6.1.1 *Any ONE motivation for using mobile devices: ✓*
- Convergence/many functions in one devices
  - Can access e-mail
  - Can open and view certain documents
  - Personal organiser
  - Online banking
- Do not accept reference to the size/mobility/portability (1)
- 6.1.2 *Any TWO disadvantages using smartphones: ✓✓*
- Difficult to input data on a small screen
  - Limited battery life - need to be charged regularly
  - Mobile operating system limits the applications
  - Not easily expandable with peripherals
  - Cost of the data used on the phone (2)
- 6.1.3 Online syncing✓ service (1)
- 6.2 *Any TWO methods of gaining access: ✓✓*
- Biometric scanners
  - RFID cards
  - NFC cards
  - Keypads with passwords (2)
- 6.3 6.3.1 Acceptable Use Policy ✓ (1)
- 6.3.2 *Any TWO of the following:✓ ✓*
- What storage devices may be used
  - Which websites may not be visited (internet usage)
  - When computers may be used
  - What e-mail may be used for
  - What actions will be taken against violation of policy
- Any other valid example (2)
- 6.3.3
- Use company time for personal use/distraction by continuous interruption of media alerts✓
  - Misuse of company resources like bandwidth✓ (2)
- 6.4 6.4.1 Intranet is:
- a local private network ✓
  - is available on a browser as webpages✓
- OR**
- The company documents are available through webpages/internet type of environment to the travel agents with access rights on the companies private network (2)

- 6.4.2 Log on to a VPN ✓ (1)
- 6.5 6.5.1 *Any ONE of* ✓  
NIC allows the computer to connect to the network.  
NIC controls the flow of data to the network (1)
- 6.5.2 The purpose of MAC address is to ensure that the network device has a unique address ✓ (1)
- 6.6 6.6.1 Take a photo using a smartphone/digital camera ✓ (1)
- 6.6.2 *Any TWO reasons for networking devices:* ✓✓  
  - Sharing of documents via a NAS
  - Sharing software
  - Ease of communication
  - Sharing of data/documents
  - Centralization of data
  - Improved management of devices and resources
(2)
- 6.6.3 *Any ONE* ✓  
  - Bluetooth
  - Wi-Fi
  - Also accept any wireless connection
(1)
- 6.7 6.7.1 *Any ONE* ✓  
  - Web browser which runs a cloud based interface
  - Installable front-end interface/application/app
(1)
- 6.7.2 *Any TWO advantages of SaaS:* ✓✓  
  - Rent the software instead of purchasing a license
  - Can be installed on multiple devices
  - Can use cloud version on any device
  - Have access to a certain amount of cloud based storage
  - Updates are done automatically/always have latest version
  - Accessible from any device with Internet access
(2)
- 6.7.3 The resources of powerful computers are shared among multiple users – virtual server ✓✓  
**OR**  
The resources of many computers are combined to create a super powerful service - to appear as if it is a single machine (2)
- 6.7.4 *Any TWO disadvantages of cloud computing:* ✓✓  
  - Need Internet connection/stable connection
  - Security of data
  - Free storage is limited
  - Need to be online to collaborate
  - Is only available as long as company supplying service is in existence
  - Data costs
(2)

- 6.8 6.8.1 Data is scrambled ✓ according to an specific algorithm ✓ (2)
- 6.8.2 *Public key encryption method:* Uses a Public key to encrypt ✓ data and a Private key (secret/hidden) to decrypt ✓ data. (2)
- 6.8.3 *Any ONE disadvantage of using BitCoin:* ✓
- Transactions cannot be cancelled/reversed
  - No person/entity is accountable
  - Need to register online as a user
- (1)
- 6.9 6.9.1 Peer-to-peer protocol ✓ to transfer and share large files ✓ across a network/Internet (2)
- 6.9.2 *Any TWO benefits of using BitTorrents:* ✓✓
- Many users can download popular files quickly
  - A single person is not responsible for all the costs of making files available for downloading (hosting)/Reduced cost to the host
  - Some equality in sharing – as a user downloads files it is also made available for other users to download/share from this computer
  - Effective use of download bandwidth
  - Client software is usually free
- (2)
- 6.10 *Any TWO:* ✓✓
- Downloading of Freeware
  - Downloading of Shareware/demos
  - Downloading registered Propriety software
- (2)

**TOTAL SECTION E: 38**  
**GRAND TOTAL: 150**