



# basic education

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

**NATIONAL  
SENIOR CERTIFICATE**

**GRADE 12**

**INFORMATION TECHNOLOGY P2**

**NOVEMBER 2021**

**MARKING GUIDELINES**

**MARKS: 150**

**These marking guidelines consist of 14 pages.**

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

1.1	1.1.1	A✓	(1)
	1.1.2	C✓	(1)
	1.1.3	B✓	(1)
	1.1.4	C✓	(1)
	1.1.5	B✓	(1)
1.2	1.2.1	F✓	(1)
	1.2.2	I✓	(1)
	1.2.3	G✓	(1)
	1.2.4	J✓	(1)
	1.2.5	M✓	(1)
	1.2.6	N✓	(1)
	1.2.7	P✓	(1)
	1.2.8	A✓	(1)
	1.2.9	B✓	(1)
	1.2.10	D✓	(1)

**TOTAL SECTION A: 15**

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

- 2.1 2.1.1 The source code of the software is available to view ✓ and is editable. ✓ (2)
- 2.1.2 *Any ONE:* ✓  
• Ubuntu  
• Linux  
• Chrome OS (1)
- 2.1.3 *Any TWO:* ✓✓  
• Lack of formal support  
• No one to hold accountable for errors  
• Possible bugs/Unstable versions (2)
- 2.2 2.2.1 Defragmentation rearranges files ✓ that are fragmented / scattered on the HDD disc ✓ (2)
- 2.2.2 Solid State Drive ✓ (1)
- 2.2.3 *Any TWO:* ✓✓  
• A SSD is electronic  
• no moving parts  
• data can be accessed instantaneously  
• no increase latency due to read write heads having to find the correct sectors / tracks (2)
- 2.3 2.3.1 Virtualisation refers to creating an entity (referred to as a virtual machine) that only exists in software. ✓ (1)
- 2.3.2 (a) *Any TWO:* ✓✓  
• minimal setup required  
• minimal initial cost  
• software is updated automatically on the cloud computers  
• new features are regularly added  
• can be used from any computer with an Internet connection  
• easy to collaborate or share information with other users (2)
- (b) You pay a subscription fee ✓ and gain access to the services provided by SaaS ✓
- OR**
- Your employer pays a subscription fee which grants employees access to the software. (2)

- 2.4 2.4.1 A full backup is made initially ✓ and on set intervals all the changes that have been made to the data get backed up. ✓ (2)
- 2.4.2 Prevents unauthorised access ✓  
**OR** an acceptable explanation (1)
- 2.5 2.5.1 Uninterrupted Power Supply (UPS) ✓  
**OR** Inverter with battery (1)
- 2.5.2 *Any ONE:* ✓
  - WiFi
  - Bluetooth
  - LAN

Also accept HDMI (1)
- 2.6 2.6.1 SOHO ✓ (1)
- 2.6.2 The word processor will be able to type, spell check, auto save, etc. ✓ at the same time. ✓ (2)
- 2.6.3 The more RAM in your computer, the more data the user can work with at once ✓ and this allows the user to run more programs at the same time ✓ (2)

**TOTAL SECTION B: 25**

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

- 3.1 3.1.1 A collection of computers or other computing devices connected ✓  
by some sort of communication medium to allow users to share  
software, hardware, data, and information. ✓ (2)
- 3.1.2 WAN / Internet ✓  
*Also ACCEPT: GAN* (1)
- 3.1.3 *Any TWO: ✓✓*  
• Administrator required/ high expertise  
• Sophisticated security required  
• Malware can spread  
• Cost implications
- Also ACCEPT:*  
Server malfunction can disrupt the network  
Loss of data due to server crashing (2)
- 3.2 3.2.1 The layout of devices in a network. ✓ (1)
- 3.2.2 The star topology requires each of the nodes / devices to be  
independently connected ✓ to the central hub / switch. ✓ (2)
- 3.3 3.3.1 *Any TWO: ✓✓*  
• Low cost  
• Software is generally free  
• Allows video conferencing / calls  
• Allows you to display / transfer documents, images, and  
videos all while simultaneously engaging in a conversation (2)
- 3.3.2 *Any ONE: ✓*  
• Stable internet connection  
• Same version of software installed on both devices  
• Purchase credits to make phone call to certain numbers  
• Have speakers, webcam, and mic / headset (1)

- 3.4 3.4.1 (a) A browser simply displays web pages. ✓ (1)
- (b) You need a search engine to search for appropriate content ✓ (1)
- 3.4.2 (a) A cookie is a small text file ✓ used to store the preferences/settings of a website visited. ✓ (2)
- (b) When visiting the same website again, it 'remembers' your profile and applies your preferences automatically. ✓ (1)
- 3.4.3 Click farms are companies that pay workers to repeatedly click on website elements / generate 'likes' ✓ to artificially 'increase' or 'boost' the status of a product or web page. ✓ (2)
- 3.5 3.5.1 Range refers to the measurement of how far data or a signal can be transmitted and received, ✓  
Bandwidth refers to how much data you can send through the network ✓ per time unit (2)
- 3.5.2 Shaping happens when an online activity gets prioritised over others ✓ when the network/Internet is busy ✓ – only certain online activities are restricted during peak times.  
Throttling reduces bandwidth to all activities ✓ when network is strained or once you have exceeded your monthly limit. (3)
- 3.6 3.6.1 A digital certificate is used to verify the validity/authenticity of a person or organisation. ✓ (1)
- 3.6.2 *Any ONE:* ✓
- There will be an 's' in the URL of the website e.g., <https://www.Google.co.za>
  - There will be a lock symbol in the address bar (1)

- 3.7 3.7.1 *Any ONE: ✓*
- A type of malware that exploits weaknesses in an application or operating system in order to spread
  - Spreads copies or replicates itself over a network (1)
- 3.7.2 *Any ONE: ✓*
- Hard drive space decreases even though no extra files have been loaded on the HDD
  - Performance of the computer decreases
  - Files are missing but not deleted by the user / new files on HDD that were not added by the user
  - Anti-virus software detects a worm and requests a user response to delete the file (1)
- 3.7.3 A firewall is a network security device/software that monitors incoming and outgoing network traffic ✓ and decides whether to allow or block specific traffic based on a defined set of security rules. ✓ (2)
- 3.7.4 A white hat hacker. ✓ (1)
- TOTAL SECTION C: 30**

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

4.1 4.1.1 A database containing many tables linked together in a relationship. ✓

*Also ACCEPT:*

- A database containing tables that are linked with primary and foreign keys.

(1)

4.1.2 *Any ONE ✓ with explanation: ✓*

- Insertion anomaly: The database has been created in such a way that required data cannot be added unless another piece of unavailable/unrelated data is also added
- Deletion anomaly: The legitimate deletion of a record of data can cause the deletion of some required data.
- Update / Modification anomaly: Incorrect data may have to be changed, which could involve many records having to be changed, leading to the possibility of some changes being made incorrectly.

(2)

4.2 Any THREE of ✓✓✓

- ReleaseDate: Date/Time
- Price:Currency
- eMagazine:Boolean
- NumPrinted:Number

(3)

4.3



Entities displayed on correct side of diagram ✓  
 Correct relationship type indicated (One-to-Many) ✓  
 Correct verb used in relationship ✓

(3)

4.4 4.4.1 *Any TWO: ✓✓*

- Completeness of data
- Accuracy of data
- Consistency of data

(2)

4.4.2 *Any ONE: ✓*

- ensuring referential integrity
- including validation in your database design

(1)



- 4.5 *Any TWO: ✓✓*
- Create a database
  - Edit the structure of a database
  - Add, edit and delete data in a database
  - Query and search the data in a database
  - Process the data in the database to extract information
  - Making data sharing possible
- (2)
- 4.6 *Any ONE: ✓*
- Default values
  - GUI-controls
  - Importing data from other systems
  - Barcode scanner/reader
  - RFID
- (1)
- 4.7 *Any TWO: ✓✓*
- it is ideal to accommodate large amounts of users
  - to work simultaneously on the database
  - from many different locations.
- (2)
- 4.8 Data warehousing will decrease the size ✓ of a database and increase the speed. ✓ (2)
- 4.9 *Any ONE: ✓*
- Selecting and preparing data sets
  - Developing data mining software and algorithms
  - Interpreting and verifying results delivered by the data mining software
- (1)

**TOTAL SECTION D: 20**



5.4

5.4.1 *Any TWO:* ✓✓

- Specifies the structure or behaviour of an object /  
Helps to visualize an object
- Provides a template as a guides to constructing an object
- Breaks down a complex object into simple parts
- To list attributes
- To indicate accessibility of attributes/methods (2)

5.4.2 Returns the current value for an attribute of an object ✓ (1)

5.4.3 `setNumCopies()` ✓ (1)**TOTAL SECTION E: 20**

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

- 6.1 6.1.1 *Any ONE:* ✓  
  - PHP
  - JavaScript
(1)
- 6.1.2 It allows web developers to design the layout ✓ and appearance of web pages once and automatically updates design changes done on other web pages ✓  
 Concepts:  
  - Design the layout and appearance once
  - Automatically updates all web pages
(2)
- 6.1.3 SQL is used to interact with the database, ✓ and make the website more interactive. ✓  
 Concepts:  
  - Interaction with the database to store and retrieve data
  - Makes the website more interactive
(2)
- 6.1.4 (a) Location based computing ✓ (1)  
 (b) GPS ✓ (1)
- 6.2 6.2.1 *Any TWO:* ✓✓  
  - RAM
  - CPU
  - Graphics card / GPU
  - I/O cards
 Also accept  
 HDD/SSD (2)
- 6.2.2 *Any TWO:* ✓✓  
  - Larger screens
  - Supports modular design/custom design
  - Easy to upgrade
(2)
- 6.2.3 *Any ONE:* ✓  
  - Disable specific features
  - Run system clean-up
(1)
- 6.2.4 Recycling the material ✓  
 Donating the computers to needy societies ✓ (2)

- 6.3 6.3.1 Process whereby certain routine office processes are carried out without human intervention ✓ (1)
- 6.3.2 *Any TWO advantages:* ✓✓
- Saves time by completing repetitive tasks faster
  - More accurate
  - Manages digital processes effectively (2)
- 6.4 6.4.1 Hotspot/Access Point ✓ (1)
- 6.4.2 (a) Attenuation causes loss of signal strength in networking – leads to interruptions ✓ (1)
- (b) Fibre optic cable ✓ (1)
- 6.4.3 *Any TWO:* ✓✓
- Wider range
  - More secure
  - Faster speed (2)
- 6.5 6.5.1 Posting of short text/pictures/audios ✓ on a social media platform. ✓
- Concepts:
- Posting of short messages
  - On a microblogging/ social media platform (2)
- 6.5.2 *Any TWO:* ✓✓
- Mental health issues
  - Social issues e.g. anti-social behaviour
  - Inactivity/overweight
  - Physical problems e.g. eye strain, wrist aches, back aches
- Also accept:  
CTS, RSI (2)
- 6.6 6.6.1 Internet of Things ✓ (1)
- 6.6.2 *Any TWO:* ✓✓
- Wi-Fi
  - Bluetooth
  - Physical Connection
  - Sensors (2)

- 6.7 6.7.1 The processing power of many computers are combined to work together ✓ to solve a single problem. ✓ (2)
- 6.7.2 *Any ONE:* ✓
- Counting the number of stars in the galaxies
  - Finding a solution/cure for the Ebola virus
  - Finding a solution/cure for certain strains of childhood cancer
  - Finding new prime numbers
  - Categorising galaxies
  - Searching for alien life
  - Fight AIDS
  - Or any other applicable example (1)
- 6.8 A growing list of records, ✓ called blocks that are linked using cryptography. ✓ (2)
- 6.9 A password is originally needed to log in ✓ then an OTP is sent to another device via SMS/email to verify ✓
- Concepts:
- Normal/standard password/verification/biometrics
  - OTP(One Time Pin) which expires sent via SMS/email to (2)
- 6.10 It is a form of encryption to control access to the content. ✓ (1)
- 6.11 6.11.1 *Any TWO:* ✓✓
- Read files
  - Copy files
  - Save As (2)
- 6.11.2 Administrator ✓
- Concept:
- Any person in charge of the files in the folder (1)

**TOTAL SECTION F: 40**  
**GRAND TOTAL: 150**