EXAMINATION	NATIONAL SENIOR CERTIFICATE
GRADE	12
DATE	NOVEMBER 2025
SUBJECT	INFORMATION TECHNOLOGY
PAPER	2
MARK TOTAL	150
DURATION (HOURS)	3
NUMBER OF PAGES	14

SOUTH AFRICAN COMPREHENSIVE ASSESSMENT INSTITUTE

SUID-AFRIKAANSE KOMPREHENSIEWE ASSESSERINGSINSTITUUT

INSTRUCTIONS AND INFORMATION

1. This question paper consists of **6 COMPULSORY SECTIONS,** totalling 150 marks, and should be completed within 3 hours. Attempt all the questions.

SECTION A:	Short questions	(20 marks)
SECTION B:	Systems technologies	(30 marks)
SECTION C:	Communications and network technologies	(20 marks)
SECTION D:	Data and information management	(25 marks)
SECTION E:	Solution development	(20 marks)
SECTION F:	Integrated scenario	(35 marks)

2. Double check that your paper is the correct subject paper and that all the pages are present. Use the numbering as given in the paper.

3. Clearly write your examination number on the **ANSWER BOOK**.

4. Make sure you answer the questions according to the specifications that are given in each question. Marks will be awarded according to the set requirements.

5. Please avoid giving one-word responses unless specifically directed to do so.

6. Answer strictly what is asked in each question. If a question doesn't ask for an example, offering one won't gain any marks.

7. Leave one line open after answering each question in the **ANSWER BOOK**.

8. Start each section on a new page.

SECTION A: SHORT QUESTIONS

QUESTION 1

1.1 Choose a term from COLUMN B that matches the description in COLUMN A. Write only the capital letter (A–P) next to the question numbers (1.1.1 to 1.1.10) in the ANSWER BOOK, e.g. 1.1.11 Q.

COLUMN A		COLUMN B	
1.1.1	A tag commonly used for pricing that can also capture data invisibly.	A.	BIOS
1.1.2	The location of a file in storage.	B.	QR readers
1.1.3	An agreement on the terms of use for a program.	C.	Backbone
1.1.4	A system component that stores computer specifications and user settings.	D.	Runtime error
1.1.5	The protection of intellectual property.	E.	CMOS
1.1.6	The communication channel that links subsections within a LAN.	F.	RFID
1.1.7	Extensions to programs to add more features.	G.	Path
1.1.8	Additional data/information about a file.	H.	URL
1.1.9	An error that occurs when a program runs successfully but produces incorrect or unexpected results.	I.	EULA
1.1.10	A language used to create visually consistent and structured layouts for websites.	J.	Copyright
		K.	Plug-in
		L.	CSS
		M.	Metadata
		N.	Logical error
		O.	Botnets
		P.	Cookies

[10]

1.2 Indicate whether the following statements are **TRUE** or **FALSE**. Write 'True' or 'False' next to the question numbers (1.2.1 to 1.2.5) in the ANSWER BOOK. Correct the statement if it is **FALSE** by changing the underlined word(s) to make the statement TRUE.

1.2.1 Arrays are data structures containing multiple values, which are identified by using indexes. (1)

1.2.2 An OTP is an example of biometric access control. (1)

1.2.3 Archiving refers to making a copy of files/folders on other storage devices/locations. (1)

1.2.4 Programming languages, like Delphi and Java, which use English-like instructions, are called low-level languages. (1)

1.2.5 Storage can be connected to the motherboard through SATA cables. (1)

(5)

1.3 Give the correct term for each of the descriptions given below. Write down only the term next to the question numbers (1.3.1 to 1.3.5) in the ANSWER BOOK.

1.3.1 The planning or a step-by-step solution to a problem that needs to be coded. (1)

1.3.2 The skills and knowledge gap between people with access to electronic devices as opposed to those without access. (1)

1.3.3 A utility program that acts as a translator between the operating system and a device. (1)

1.3.4 The concept of creating immersive environments that exist only through code. (1)

1.3.5 A method of viewing video or listening to audio content without downloading the files. (1)

(5)

TOTAL SECTION A: [20]

SECTION B: SYSTEMS TECHNOLOGIES

QUESTION 2

Scenario:

An aspiring gamer researched high-performance computer specifications. The gamer also found recommendations for gaming peripherals.

The following specifications and mouse were suggested:

Power users typically need computers with the following specifications:

- **Processor**: A quad-core processor or higher with at least 5.3 GHz. For Windows, an i7 or higher generation Intel Core processor is recommended.
- **RAM**: 16 GB or more of DDR4 RAM.
- **Hard drive**: A 256 GB SSD or higher.
- **Graphics card**: A dedicated graphics card with at least 4 GB of video RAM.
- **Operating system**: The latest version of Windows or macOS.
- **Network**: 802.11n wireless with WPA2 Enterprise and an Ethernet adapter.
- **Screen**: An HD screen with 1920x1080 resolution or higher.

Power users often need to access the cloud from multiple locations, which can be a security risk. Hardware-based security features can help protect data in use.

[Source: https://www.google.com/search?q=power+user+mouse]

2.1 State why the phrase 'power users' was used for this research. (1)

2.2 The specifications refer to processor requirements.

2.2.1 What is the purpose of a processor? (1)

2.2.2 Explain what a quad-core processor is. (1)

2.2.3 Differentiate between *multi-processing* and *multitasking*. (4)

2.2.4 Explain what cache is in the context of a processor and describe its function. (2)

2.3 Refer to the screen and graphics card recommendations.

2.3.1 What is meant by screen resolution? (1)

2.3.2 Justify why a dedicated graphics card is a requirement. (3)

2.4 Explain why a computer requires both RAM and secondary storage by highlighting the characteristics and roles of each. (4)

2.5 Operating system requirements are suggested in the specification list.

2.5.1 Define the term *operating system*. (2)

2.5.2 List THREE functions of an operating system. (3)

2.5.3 Why is there no additional software recommended in the specification list? (1)

2.6 The mouse's image is different from that of a standard mouse.
Define *ergonomic design* and state why this mouse is recommended for gamers. (3)

2.7 The computer has different ports to connect peripheral devices.

2.7.1 State ONE benefit of using a wireless connection for a mouse and keyboard. (1)

2.7.2 What port is typically used for a wired connection between a mouse and keyboard? (1)

2.7.3 Which type of port is used for connecting a monitor (screen) that also carries sound signals? (1)

2.8 Why is the electronic solid-state drive (SSD) recommended and not a conventional hard disk drive? (1)

TOTAL SECTION B: [30]

SECTION C: COMMUNICATIONS AND NETWORK TECHNOLOGIES

QUESTION 3

3.1 Define the term *computer network*. (2)

3.2 Devices can connect to a network using either wired or wireless methods.

3.2.1 Name and explain THREE limitations found in BOTH connection methods. (3)

3.2.2 Name the wired connection option that is least susceptible to the weaknesses explained in QUESTION 3.2.1. (1)

3.2.3 Provide an example of a situation in a classroom or office LAN where a WLAN would be preferred. (1)

3.3 Networks can be set up using different topologies.

Draw a labelled diagram of a typical client-server wired LAN network using a star topology for use in a classroom setting. (4)

3.4 An Internet connection allows access to the 'cloud'.

3.4.1 List TWO advantages of cloud computing. (2)

3.4.2 Explain the term *telecommuting/remote work.* (2)

3.4.3 Define what *SaaS* is and provide TWO reasons why companies might prefer this software distribution option. (Do not merely expand the abbreviation.) (3)

3.4.4 Explain what a virtual office is and why the concept has become very popular. (2)

TOTAL SECTION C: [20]

SECTION D: DATA AND INFORMATION MANAGEMENT

QUESTION 4

Details about CPUs and their manufacturing companies have been stored in a database containing two tables named **tblCPU** and **tblManufacturers**.

The design and partial information from these tables are displayed below.

Design of **tblCPU**

Fieldname	Data type	Explanation
CPU_Name	string	The code by which the CPU is known
Cores	**(a)**	The number of cores in the CPU
Speed	**(b)**	Minimum and maximum GHz at which the CPU functions
TDP	integer	Maximum heat it can resist, measured in Watt
Cache	integer	The total amount of cache memory in megabytes
Release	Date	Date it was released

Extract from **tblCPU**

CPU_Name	Cores	Speed	TDP	Cache	Release date
Core Ultra 9 258K	24	3.7 – 4.1	125	36	24/10/2024
Ryzen 5 5600G	6	3.9 – 4.4	65	16	13/4/2021
Ryzen 7 5700X	8	3.4 – 4.6	65	32	4/4/2022
Ryzen 7 5700GT	6	3.6 – 4.6	65	16	8/1/2024
Ryzen 7 5700U	8	1.8 – 4.3	15	8	12/1/2021
Athlon 300G	2	3.5	35	4	20/11/2019
FX-8350	8	4.0 – 4.2	125	8	23/10/2012

Design of **tblManufacturers**

Fieldname	Data type	Explanation
ShortName **(PK)**	string	Code used for the CPU company
Comp_Name	string	The full name of the company

Extract from **tblManufacturers**

ShortName	Comp_Name
Intel	Intel Corporation
AMD	Advanced Micro Devices
ARM	Arms Holding plc
IBM	International Business Machines Corporation
NVIDIA	Nvidia Corporation

4.1 Refer to the given database design and sample data and answer the following questions:

4.1.1 If a relationship is to be set up between the two tables, then:

Field **X** from table **Y** is to be repeated in table **Z.**

Provide the field name for **X** and the table names for **Y** and **Z,** respectively**.** (Indicate the letter and your corresponding answer) (3)

4.1.2 What characteristic must the field **CPU_Name** have in the table **tblCPU** to qualify as a primary key? (1)

4.1.3 Identify the most suitable data types for **(a)** and **(b)** in the **tblCPU** table**.** (2)

4.1.4 The field **Speed** cannot be used for calculations in its current format.

How can the table's design be changed so that calculations can be performed with the minimum and maximum processing values. (1)

4.1.5 The release date could also be saved as string data. Why do you think the date data type is preferred? (1)

4.2 Define the concept of *database normalisation*. (2)

4.3 Differentiate between a *server-based DBMS* and a *desktop database* by explaining TWO properties of each. (4)

4.4 Stored data is used for calculations and decision-making.

4.4.1 Explain what *GIGO* means and its implication.
No marks will be awarded for just expanding the acronym. (2)

4.4.2 Explain what *data validation* is, why it is important, and how it can be applied by providing ONE example. (3)

4.4.3 State THREE strategies to safeguard the data on a computer against natural disasters and human-related issues. Exclude threats related to internet access. (3)

4.4.4 Explain the purpose of data mining. (2)

4.4.5 Name ONE advantage of storing data in a database instead of a text file. (1)

TOTAL SECTION D: [25]

SECTION E: SOLUTION DEVELOPMENT

QUESTION 5

5.1 Many programming languages use an object-oriented programming (OOP) approach. Answer the following questions regarding OOP as it is used in the Delphi language.

5.1.1 a) Name the method that is used to instantiate an object. (1)
b) Explain what happens during instantiation. (2)

5.1.2 Explain what mutator methods do and specify whether a mutator is a function or procedure. (2)

5.1.3 What is the purpose of a **toString** method? (1)

5.1.4 List TWO benefits of using modular programming. (2)

5.2 An input screen contains components for entering your South African ID number, age, and date of birth.

Is it necessary to store all these values, after use, from the input screen? Motivate your answer. (1)

5.3 Study the following program segment in Delphi, which contains logical and syntax errors.

The purpose of the segment is to:

- Delete all characters, except the alphabetical characters and digits, from the input string.
- Count the number of characters deleted.

Example:

Input: Use #9 to sp@ce!
Output: Use9tospce
Number of characters deleted: 6.

```
var sLine: string;
    iLoper, iDeleted: integer;
begin
 1.
 2.   sLine := edtInput;
 3.   for iLoper := 1 to length(sLine) do
 4.        if NOT(upcase(sLine[iLoper]) in [‘A’..’Z’,0..9])
 5.               then delete(sLine,iloper,1);
 6.        inc(iDeleted);
 7.   Showmessage(sLine+#10+‘Number of characters deleted: ’+
       strtoint(iDeleted);
```

Correct the code above by rewriting the entire program. Clearly indicate by underlining what changes have been made to achieve the correct result. Include the line numbers of the code for easy reference. (6)

5.4 A variable, **rSpeed** declared as a real value, stores the speed of a CPU.
The speed category Slow, Meduim, Fast and Very Fast should be stored in the variable **sCat** based on the **rSpeed** value using the following criteria:

- Smaller than 2.5 is 'Slow',
- From 2.5 and up to 3.2 is 'Medium'.
- 'Very fast' is allocated to all calvalues of 4 and above,
- else it is rated as 'Fast'.

5.4.1 Write an **algorithm in Pseudocode,** to implement this classification.

Note: Marks will be deducted for Delphi code. (4)

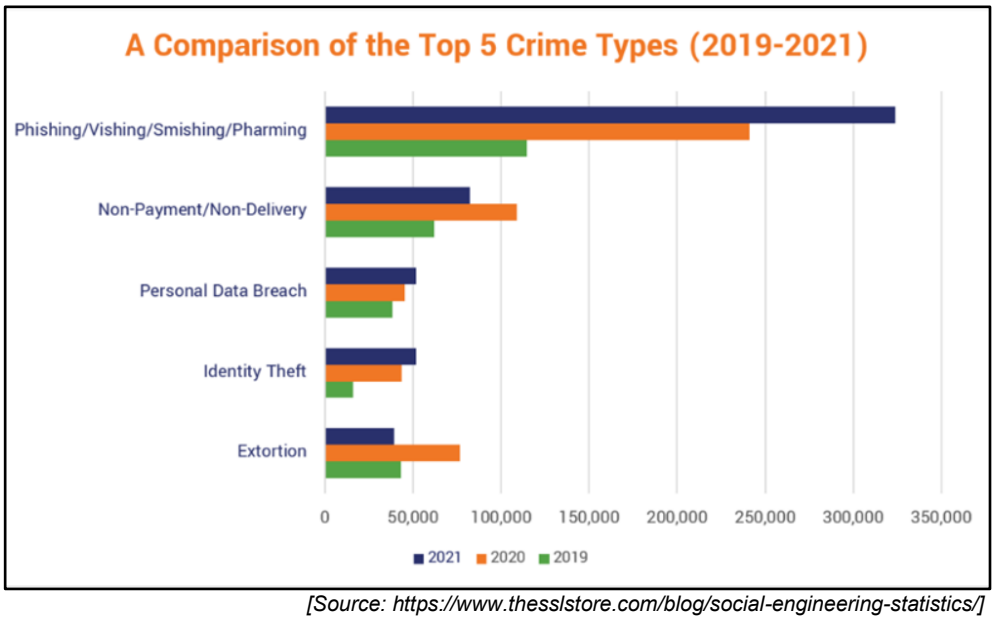
5.4.2 Is it possible to use a CASE statement when translating the algorithm into Delphi? Motivate your answer. (1)

TOTAL SECTION E: [20]

SECTION F: INTEGRATED SCENARIO

QUESTION 6

6.1 The graph below shows a rise in Internet-related crimes.



[Source: https://www.thesslstore.com/blog/social-engineering-statistics/]

6.1.1 Define the following terms:

a) *Social engineering.* (2)
b) *Identity theft.* (2)

6.1.2 Banks are informing the public by providing clients with details about Internet crimes. They also include disclaimers to protect themselves in case clients become victims of these crimes.

What advice would you offer clients to help prevent them from falling victim to Internet crimes? (2)

6.1.3 The network administrator of a company simulates and sends various social engineering attacks to employees on an *ad hoc* basis. The employees are expected to identify and report these 'attacks'.

Do you think that it is ethical of the company to do this?
Provide a suitable reason for your answer. (2)

6.1.4 Why would a company employ a hacker? (2)

6.2

> **Electronic waste (e-waste)**
> 01 Oct 2024 — **E-waste** is one of the fastest growing solid waste streams in the world. In 2022, an estimated 62 million tonnes of **e-waste** were produced ...

[Source: https://www.who.int/news-room/fact-sheets/detail/electronic-waste-(e-waste)]

6.2.1 What is meant by the term *green computing*? (2)

6.2.2 Suggest THREE actions that may be used to limit e-waste. (3)

6.3 Although laws exist to prevent the illegal copying and production of artefacts, music, and software, they are often disregarded.

6.3.1 Explain what soft lifting means. (2)

6.3.2 You quoted a definition directly from another source in a project. What is the correct way of acknowledging your source? (1)

6.3.3 How is software distributed from vendors currently? (1)

6.3.4 Explain what software piracy is. (2)

6.4 In general, we upgrade RAM and CPUs more frequently than motherboards.

> **How often are computer manufacturers releasing new ...**
> How often do companies release new gaming consoles? Nowadays it seems to be an average of **about 4~7 ish years**. If we were to account for all ...

[Source: https://www.quora.com/How-often-are-computer-manufacturers-releasing-new-models]

6.4.1 Explain what a motherboard is and specify TWO functions it performs in a computer system. (3)

6.4.2 Why must new motherboards be designed instead of maintaining the same design over time? (1)

6.4.3 You want to enhance the computer's performance. Why would you suggest upgrading the RAM as a cost-effective option?

Motivate your answer by also referring to virtual memory and its effect. (3)

6.5 Classroom experiences can be improved with the use of AR (Augmented Reality).
Give TWO well explained examples to support this statement. (2)

6.6 A website which handles payments and sensitive documents requires high security during transit over the Internet.

6.6.1 Expand the acronym SSL in full. (1)

6.6.2 Explain how SSL helps ensure the secure transfer of data. (2)

6.6.3 Differentiate between the *Internet* and the *WWW*. (2)

TOTAL SECTION F: [35]

GRAND TOTAL: [150]