



**NATIONAL
SENIOR CERTIFICATE**

GRADE 12

SEPTEMBER 2023

INFORMATION TECHNOLOGY P2

MARKS: 150

TIME: 3 hours

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This question paper consists of 22 pages.

INSTRUCTIONS AND INFORMATION

1. This paper consists of SIX sections:

SECTION A: Short questions	(15)
SECTION B: System Technologies	(29)
SECTION C: Communication and Network Technologies	(23)
SECTION D: Data and Information Management	(21)
SECTION E: Solution Development	(39)
SECTION F: Integrated Scenario	

2. Read ALL the questions carefully.

3. Answer ALL the questions.

4. The mark allocation generally gives an indication of the number of facts/reasons required.

5. Number the answers correctly according to the numbering system used in this question paper.

6. Write neatly and legibly.

SECTION A: SHORT QUESTIONS

QUESTION 1

- 1.1 Give the correct computer term for each of the following descriptions. Write only the term next to the question numbers (1.1.1 to 1.1.10) in the ANSWER BOOK.
- 1.1.1 The combination of more than one field to uniquely identify a record in a database (1)
- 1.1.2 The unnecessary repetition of data in a database (1)
- 1.1.3 Programs that are part of system software and do maintenance and administrative tasks (1)
- 1.1.4 The gap that exists between people who have access to technology and those who have no access. (1)
- 1.1.5 Electrical paths etched on a motherboard, which are used to transfer data/signals between different parts (1)
- 1.1.6 A term used to describe the data bundle limit (1)
- 1.1.7 Working in a decentralised location, for example at home using modern communication systems (1)

- 1.1.8 Trend whereby separate technologies and functions from multiple devices are combined into a single multi-purpose device (1)
- 1.1.9 Simulation of human decision-making process by a computer system that is programmed to react on the basis of input gained from sensors (1)
- 1.1.10 A device that makes it possible for networks to communicate over internet by directing data to its correct destination (1)

1.2 Various options are provided as possible answers to the following questions. Choose the answer and write only letter (A–D) next to the question numbers (1.2.1 to 1.2.5) in the ANSWER BOOK, for example 1.2.6 D.

1.2.1 The grouping of attributes and behaviour of a class in one entity:

- A Encapsulation
- B Object
- C Template
- D Method (1)

1.2.2 The data fields of a class:

- A Entity
- B Attributes
- C Tuple
- D Variables (1)

1.2.3 Instructions in binary format that the CPU can directly execute:

- A Source code
- B ASCII code
- C Machine code
- D Application code (1)

1.2.4 ... combines JavaScript with a browser command to allow the browser to download data without requiring the whole page to refresh.

- A HTML
- B CSS
- C HTTP
- D AJAX (1)

1.2.5 The acronym RTF means:

- A Rich Tool Format
- B Real Text Format
- C Rich Text Format
- D Rich Text File (1)

TOTAL SECTION A: 15

SECTION B: SYSTEMS TECHNOLOGIES

QUESTION 2



2.1 Consider the above picture of a hardware component and answer the questions that follow.

2.1.1 Name the above hardware component. (1)

2.1.2 Explain the function of this hardware component. (1)

2.1.3 Name a slot that you can use to connect this hardware component to the motherboard. (1)

2.1.4 List TWO main components found on this hardware component. (2)

- 2.1.5 Name TWO hardware parts found in this hardware component used to regulate/control the temperature of the device. (2)
- 2.1.6 Name the THREE ports found on this hardware component. (3)
- 2.2 Differentiate between *disk fragmentation* and *disk defragmentation*. (2)
- 2.3 A technology that automates the configuration process of a device before it can be used is called ... (1)
- 2.4 SSD's are now more preferred than HDD's.
What are the THREE main differences between SSD's and HDD's? (3)
- 2.5 Humans cause errors when they work with data.
Give THREE errors caused by humans which may lead to data loss. (3)

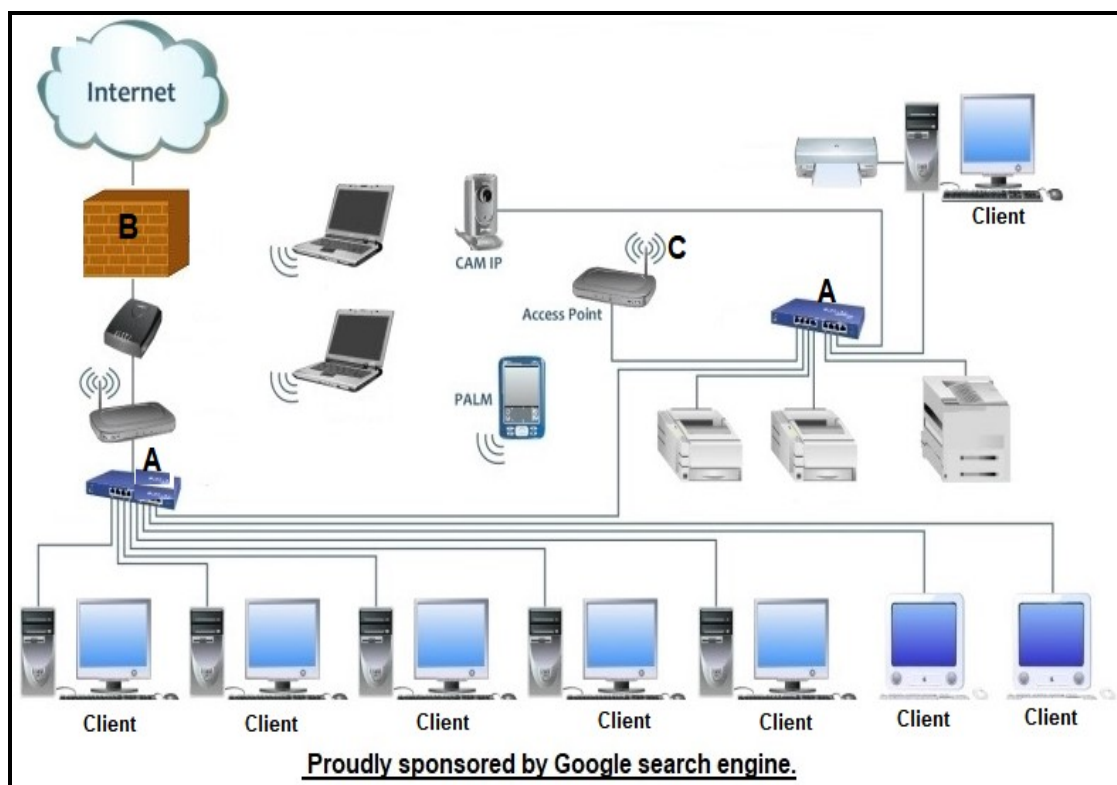
- 2.6 Data backup is a process of duplicating data and storing it in an alternative location to allow the retrieval of the duplicate set after a data loss event.
- 2.6.1 Name THREE techniques that you can use to create backup. (3)
- 2.6.2 Name THREE types of backup methods used to backup data. (3)
- 2.7 Name TWO reasons of designing computing devices following modular design. (2)
- 2.8 Computers need sufficient/plenty of unused space on the hard-drive in order to operate smoothly.
- Name TWO actions you can do to free up space in a disk drive. (2)

TOTAL SECTION B: 29

SECTION C: COMMUNICATION AND NETWORK TECHNOLOGIES

QUESTION 3

3.1 Communication systems/networks are everywhere. Analyse the diagram below and answer the questions (3.1.1 to 3.1.6) that follows.



3.1.1 Give the other word used to identify computing devices that are connected to a network. (1)

3.1.2 The above diagram is the combination of a LAN topology and a WAN topology.

(a) Briefly explain the concept *network topology*. (1)

(b) What is another name of access point? (1)

(c) Name TWO advantages/reasons of having a network. (2)

3.1.3 The network diagram has computing devices labelled clients.

Describe the TWO categories of clients. (4)

3.1.4 The network diagram has a component labelled **A**.

(a) Name the network component labelled **A** in the network diagram. (1)

(b) Name TWO functions of the network component labelled **A**. (2)

- 3.1.5 A computing device is usually placed between the internet and the network.
- (a) Give the name of the part labelled **B** in the network diagram. (1)
 - (b) List TWO roles played by this hardware component. (2)
- 3.1.6 What does the symbol labelled **C** in the network diagram represent and what is the role of this symbol? (2)
- 3.2 Discuss TWO benefits of application of the web. (2)
- 3.3 A set of rules that describe how data is sent between two computing devices in a network is called ... (1)
- 3.4 Uniform Resource Locator (URL) is found in most browsers.
- 3.4.1 Explain what a URL shortener (e.g. Bit.ly) is. (1)
 - 3.4.2 List TWO advantages of a URL shortener. (2)

TOTAL SECTION C: 23

SECTION D: DATA AND INFORMATION MANAGEMENT

QUESTION 4

Databases are ideal when you have a large amount of related data to store and quickly need to insert, update, query and create reports about the data.

- 4.1 Data integrity refers to maintaining the accuracy and consistency of data stored in a database.

List and explain TWO categories of data integrity. (4)

- 4.2 A transaction processing system is a software system that captures and processes data from everyday business activities.

Indicate whether the following statements related to transaction processing systems are TRUE or FALSE. Write only 'true' or 'false' next to the question numbers (4.2.1 to 4.2.4) in the ANSWER BOOK.

- 4.2.1 Transaction refers to any activity regarding the creating, padding, editing, saving or deleting of data managed by DBMS. (1)

- 4.2.2 When a record is open, either for editing or inserting, the record is flagged as in use. This is called record lock. (1)

- 4.2.3 Purge/consolidate occurs when the DBMS gets an instruction to reverse a transaction and restores the data back to its previous state. (1)
- 4.2.4 Commit or post is when the DBMS gets the instruction to save changes that have been made, back to storage. (1)
- 4.3 List TWO characteristics of quality data. (2)
- 4.4 Computers and computer users are exposed to several types of security risks.
- 4.4.1 Briefly explain what *data security* is. (1)
- 4.4.2 List THREE measures of enforcing data security. (3)
- 4.5 The database ***TouristApp*** is used by ECtourist sites and has TWO tables, ***tblGates*** and ***tblVisitors***.

tblGates
GateName
GateID
Telephone
Closes
Accommodation

tblVisitors
Overseas
Passengers
Date
Cost
VehicleNo
Out
Entrance

- 4.5.1 Name the primary keys in both tables (*tblGates* and *tblVisitors*). (2)

- 4.5.2 Name THREE fields that have a datatype Yes/No in both tables (*tblGates* and *tblVisitors*). (3)
- 4.5.3 The above tables (*tblGates* and *tblVisitors*) can be joined using the primary key and a foreign key.
- (a) Which table has a field that can be used as a foreign key to connect the other table? (1)
- (b) Name the foreign key field. (1)
- 4.5.4 Name the type of relationship that can be formed/created between *tblGates* and *tblVisitors*. (1)
- 4.5.5 Name the datatype for the fieldname **Closes** in *tblGates* table. (1)

TOTAL SECTION D: 23

SECTION E: SOLUTION DEVELOPMENT

QUESTION 5

- 5.1 Name a temporal input component created through Delphi programming code. (1)
- 5.2 Indicate whether the following statements are TRUE or FALSE. Write only 'true' or 'false' next to the question numbers (5.2.1 to 5.2.5) in the ANSWER BOOK.
- 5.2.1 Logical filename refers to external filename found in a storage device and contains data. (1)
- 5.2.2 Values stored in a matrix/two-dimensional array are called elements. (1)
- 5.2.3 A float pointing number is a whole number. (1)
- 5.2.4 The use of functions to convert one datatype to another datatype (e.g. string to integer) is called type casting. (1)
- 5.2.5 The start index value of a string grid component is always zero (0). (1)
- 5.3 Differentiate between *WriteLn* and *Write*. (2)
- 5.4 Discuss FOUR ways that can be used to populate an array. (4)
- 5.5 Differentiate between *Constructor* and *Destructor*. (2)

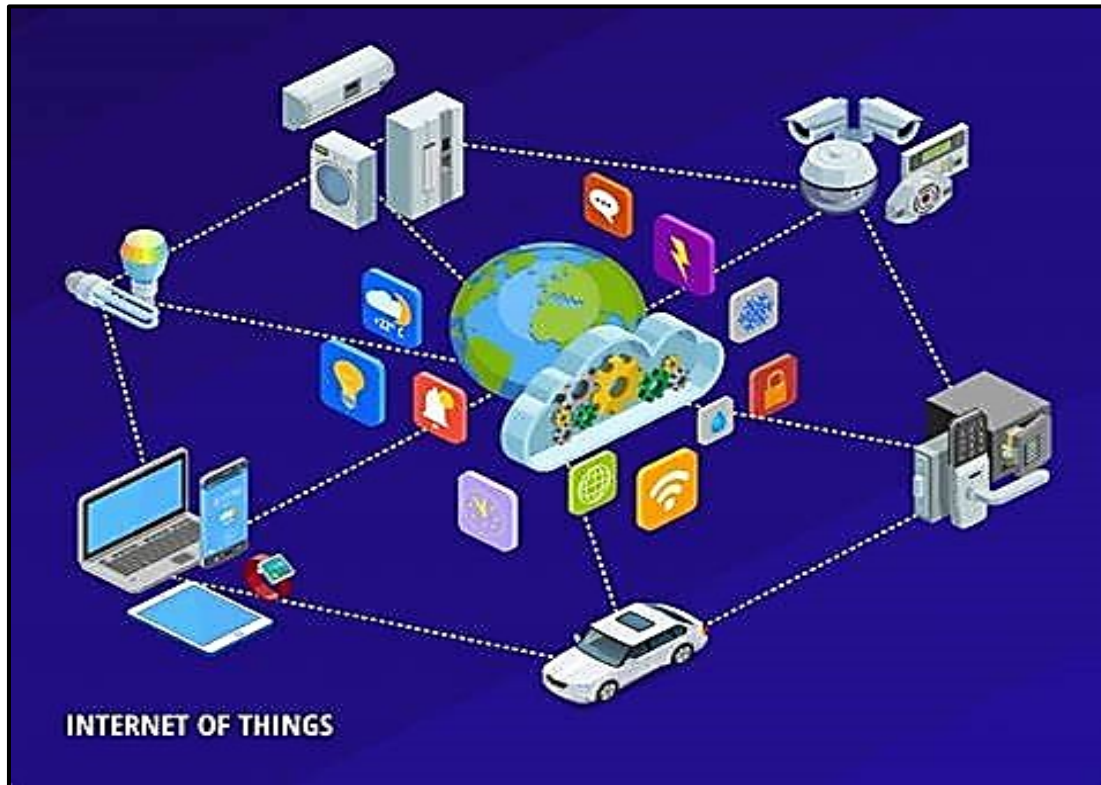
- 5.6 The basic class structure is always defined/created between type and implementation.
- 5.6.1 Briefly explain what a *method stub* is. (1)
- 5.6.2 Name the keys which are used to create/produce method stubs. (1)
- 5.6.3 Name the special key/main letter that is prefixed to a class name and name the meaning of the prefix. (2)
- 5.7 Briefly explain the purpose of a *toString* method in a class. (1)
- 5.8 A method name followed by its parameter is called ... (1)
- 5.9 Name the keyword/concept that permits/allows programmers to declare multiple methods that share the same name but with a different number of parameters and types. (1)

TOTAL SECTION D: 21

SECTION F: INTEGRATED SCENARIO

QUESTION 6

6.1 The IoT offers a lot of ease and relaxation/relief in this modern, fast-paced living in this technological/high-tech world.



Examine the above diagram and answer the following questions.

- 6.1.1 Briefly explain the concept *Internet of Things/IoT*. (1)
- 6.1.2 Name TWO recent convergences of three technological trends that has made IoT possible. (2)
- 6.1.3 Name THREE ways that IoT will affect and benefit society. (3)

6.2 Study the picture below and answer the questions that follow.



6.2.1 Name the device shown above. (1)

6.2.2 Describe the device named in QUESTION 6.2.1. (1)

6.2.3 List THREE advantages of the device shown above. (3)

6.2.4 Name THREE examples of areas where this device can be used. (3)

6.3 Software is becoming smarter, easier to use and better at helping humans than ever before.

6.3.1 List THREE benefits/advantages of SaaS. (3)

6.3.2 Name THREE categories/forms of SaaS. (3)

6.3.3 Briefly explain the concept *virtual reality*. (1)

6.3.4 Name TWO areas of industry where virtual reality can be used. (2)

6.4 Initially PC, smartphone and tablet applications for augmented reality focused on games, but the uses of augmented reality have extended far and wide.

6.4.1 Briefly explain the concept *augmented reality*. (1)

6.4.2 Name TWO uses of augmented reality technology. (2)

6.4.3 Name TWO hardware requirements of augmented reality. (2)

6.5 Wearable devices take mobile technology to a higher level in ICT.

6.5.1 Briefly explain the concept *wearable devices*. (1)

6.5.2 Name TWO examples of wearable devices. (2)

6.6 Differentiate between *e-learning* and *m-learning*. (2)

6.7 Examine the diagram below and answer the questions that follow.



6.7.1 Explain what *big data* is. (1)

6.7.2 Name TWO examples in an ICT environment where big data can be used. (2)

- 6.8 Briefly explain what NFC is (*acronym not needed*). (1)
- 6.9 Differentiate between *network shaping* and *network throttling*. (2)

TOTAL SECTION F: 39
GRAND TOTAL: 150