Province of the
EASTERN CAPE
EDUCATION

Iphondo leMpuma Kapa: Isebe leMfundo
Provinsie van die Oos Kaap: Department van Onderwys
Porafensie Ya Kapa Botjhabela: Lefapha la Thuto

NATIONAL SENIOR CERTIFICATE

GRADE 12

SEPTEMBER 2024

INFORMATION TECHNOLOGY P2

MARKS: **150**

TIME: **3 hours**

This question paper consists of 13 pages.

INSTRUCTIONS AND INFORMATION

1. This paper consists of SIX sections:

SECTION A: Short questions	(15)
SECTION B: System Technologies	(25)
SECTION C: Communication and Network Technologies	(24)
SECTION D: Data and Information Management	(26)
SECTION E: Solution Development	(25)
SECTION F: Integrated Scenario	(35)

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. Answer QUESTION 4.5.1 and 5.3.6 on the attached ANSWER SHEET.

7. Write neatly and legibly.

SECTION A: SHORT QUESTIONS

QUESTION 1

1.1 Give ONE word/term for each of the following descriptions. Write only the word/term next to the question numbers (1.1.1 to 1.1.10).

1.1.1 An identity theft scam where the user is automatically redirected to another fake website even if the correct URL was entered. (1)

1.1.2 A category of software specifically designed to perform various tasks and functions for end-users. (1)

1.1.3 A part of a file name which uniquely identifies the type of file. (1)

1.1.4 It refers to the total amount of data that can be transferred from one point to another in a given period of time. (1)

1.1.5 A standard language used for querying and manipulating data in a database. (1)

1.1.6 A peer-to-peer protocol used for downloading and uploading large files over the internet. (1)

1.1.7 A strategy used to obtain a high-ranking placement in the search engine results page of a search engine. (1)

1.1.8 A technique where certain internet services are given preference while others are given less priority, so that performance is maintained for more critical services. (1)

1.1.9 A common protocol used by e-mail clients to retrieve e-mails from a mail server. (1)

1.1.10 A database design technique that reduces data redundancy and eliminates issues caused by anomalies. (1)

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

1.2.1 CSV is an acronym for …

A Comma Separated Volume
B Comma Separated Values
C Common Separated Values
D Comma Saturated Values (1)

1.2.2 The instance of a class in OOP is called a/an …

A attribute.
B method.
C object.
D data type. (1)

1.2.3 Consider the array declaration below:

```
var myArray: array[0..6] of Integer;
```

The correct code to access the third element of the above array, is:

A myArray[3]
B Array[3]
C myArray[2]
D myArray{2} (1)

1.2.4 Which technology enables SaaS providers to serve multiple customers from a single instance of their software?

A Virtualisation
B Blockchain
C Machine Learning
D Augmented Reality (1)

1.2.5 Given the following statement:

```
iValue := CEIL(15/4) + 22 DIV 4 MOD 3;
```

The value of iValue will be …

A 26
B 6
C 5
D 4 (1)

TOTAL SECTION A: 15

SECTION B: SYSTEMS TECHNOLOGIES

QUESTION 2

2.1 A Central Processing Unit (CPU) plays a significant role in the performance of a PC.

2.1.1 Name the socket which connects the CPU to the motherboard. (1)

2.1.2 Define *multiprocessing*. (2)

2.1.3 List the FOUR steps of the machine cycle. (4)

2.2 Indicate whether the following statements are TRUE or FALSE.
Write only TRUE or FALSE next to the question numbers (2.2.1 to 2.2.4) in the ANSWER BOOK.

2.2.1 Convergence is a trend whereby separate technologies and functions from multiple devices are combined into a single multi-purpose device. (1)

2.2.2 A core is a single complete working RAM circuit. (1)

2.2.3 An interpreter is software that translates programming instructions into executable files. (1)

2.2.4 The BIOS is stored on a non-volatile ROM chip on the computer's motherboard. (1)

2.3 Caching offers advantages to users, network systems and businesses.

2.3.1 Briefly explain what *caching* is. (2)

2.3.2 Name and explain THREE types/forms of caching. (6)

2.4 Businesses are becoming more reliant on cloud-based resources.

2.4.1 Briefly explain what *cloud computing* is. (1)

2.4.2 Give TWO advantages of cloud computing. (2)

2.5 A good backup strategy is important and can protect you from data loss.

Provide THREE guidelines to consider when creating a backup strategy. (3)

TOTAL SECTION B: 25

SECTION C: COMMUNICATION AND NETWORK TECHNOLOGIES

QUESTION 3

3.1 The internet and its technologies are changing rapidly; and has changed the way people live and conduct business.

3.1.1 Distinguish between the terms *Internet* and *World Wide Web*. (2)

3.1.2 Explain what is meant by the *semantic web.* (2)

3.2 A school's gaming club has decided to setup a temporary peer-to-peer LAN which will be connected to the school's client-server network.

3.2.1 Tabulate TWO differences between a client-server network and a peer-to-peer LAN. (4)

3.2.2 The most commonly used communication media used in a wired local area network is a UTP cable.

List and explain THREE weaknesses of UTP cables. (3)

3.2.3 State TWO functions of a network switch. (2)

3.2.4 Differentiate between a *server* and a *workstation.* (2)

3.2.5 The gaming club would like to setup a WiFi network.

Give the name of an additional network device which they will need to purchase to change the LAN to a WLAN. (1)

3.3 State THREE disadvantages of having a wireless computer network. (3)

3.4 Explain the purpose of a router. (2)

3.5 Distinguish between a *HAN* and a *PAN*. (2)

3.6 What do we call a form of fraud, where a large group of low-paid workers are hired to click on paid advertising links to artificially inflate the traffic to the site? (1)

TOTAL SECTION C: 24

SECTION D: DATA AND INFORMATION MANAGEMENT

QUESTION 4

4.1 Good database design is important for reliable and accurate data.

4.1.1 Briefly explain what a *database anomaly* is. (1)

4.1.2 List THREE types of anomalies commonly found in bad database design. (3)

4.2 Identify THREE problems with the design of the following database table.

Field Name	Data Type	Description
FirstName	Short Text	Name of owner
Surname	Short Text	Surname of owner
Address	Short Text	Street address, Suburb and Postal code
Vehicle Registration No 1	Short Text	First vehicle registration number
Vehicle Registration No 2	Short Text	Second vehicle registration number
Vehicle Registration No 3	Short Text	Third vehicle registration number

(3)

4.3 The use of RFID technology is becoming increasingly popular in data management.

4.3.1 Give TWO examples of how RFID can be used in businesses. (2)

4.3.2 State THREE advantages of RFID technology compared to barcode technology. (3)

4.4 Social media companies use data mining for a variety of reasons.

4.4.1 Define *data mining*. (3)

4.4.2 Explain how data mining can be used on social media sites, for example Facebook. (2)

4.4.3 Discuss TWO risks involved with social media data mining. (2)

4.5 Intelligent devices are becoming increasingly popular. A database is used to store details about intelligent devices and contains two tables, *tblGadgets and tblManufacturers*.

tblGadgets

DeviceID	DeviceName	Category	OperatingSystem	Price	NumInStock	ProducerID
D001	Always Summer	Smart heating	Android	R300.00	107	M105
D002	Boom XL	Smart speaker	iOS	R1,500.00	80	M104
D003	Boom XXL	Smart speaker	iOS	R2,000.00	50	M104
D004	Bulb 6	Smart lighting	Android	R500.00	100	M101
D005	Core Sound	Smart speaker	iOS	R999.00	425	M106
D006	Crystal TV	Smart TV	HarmonyOS	R13,999.00	389	M103
D007	Flash 4	Smart lighting	iOS	R200.00	313	M104
D008	Freeze 3	Smart refrigerator	Android	R12,000.00	2	M101
D009	Ice Box	Smart refrigerator	Android	R14,999.00	14	M105

tblManuafacturers

ManufacturerID	ManufacturerName	ContactNumber	OnlineSupport
M100	Berry tech	0122035878	☑
M101	Gem smart	0169725478	☐
M102	Gemini	0512025306	☐
M103	Jupiter Inc	0311257412	☑
M104	Mobile Comp	0412258756	☐
M105	Smart computing	0169632587	☑
M106	Tech wiz	0412224568	☑

4.5.1 Answer this question on the ANSWER SHEET provided on page 13.

You are asked to design a relational database. The table designs below are incomplete.

tblManufacturers	
	ManufacturerID
	ManufacturerName
	ContactNumber
	OnlineSupport

tblGadgets	
	DeviceID
	DeviceName
	Category
	OperatingSystem
	Price
	NumInStock
	ProducerID

(a) Identify a primary key (PK) in each table. Write PK next to the applicable field names. (2)

(b) Identify a foreign key (FK). Write FK next to the applicable field name. (1)

(c) Show how you would link the 2 tables and indicate the type of relationship that exists. (2)

4.5.2 Identify the data type of the following fields:

(a) Price (1)

(b) OnlineSupport (1)

TOTAL SECTION D: 26

SECTION E: SOLUTION DEVELOPMENT

QUESTION 5

5.1 Incorporating defensive programming practices can help avoid logical errors in programs.

5.1.1 Explain what is meant by the term *logical error*. (2)

5.1.2 Explain what is meant by *defensive programming*. (1)

5.2 Explain why the binary search algorithm cannot be used in the following array in its current state:

arrNumbers							
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
13	56	78	23	48	89	76	98

(1)

5.3 Study the Delphi code below and answer QUESTIONS 5.3.1 to 5.3.6.

```
begin
    iStartValue := LowerBound.Value;
    iEndValue := UpperBound.Value;
{1} iSum := 0;
{2} for iLoop := iStartValue to iEndValue do
{3}   iSum := iSum + iLoop;
{4} lblSum.Caption := 'The sum is ' + IntToStr(iSum);
{5} lblCount.Caption := 'The loop is executed '+____+ 'times. ';
end;
```

5.3.1 Identify the Delphi component type that is used to obtain input in the above code segment. (1)

5.3.2 Write an alternative line of Delphi code that will have the same effect as the code in line 3. (2)

5.3.3 Write down the line number from the code segment that implements the following:

(a) Initialisation (1)

(b) Typecasting (1)

5.3.4 Complete the missing code in line 5 that must display how many times the loop was executed. (2)

5.3.5 Rewrite line 2 as a conditional loop. (4)

5.3.6 Answer this question on the ANSWER SHEET provided on page 13.

Complete the trace table by tracing step by step through the given code segment. **iStartValue = 4** and **iEndValue = 6**.

Step	Line no	iLoop	iSum	Output
1				
2				
3				
. . .				

(4)

5.4 The following UML (Unified Modelling Language) class diagram represents a TSmartSwitch class.

```
TSmartSwitch
- fSwitchID – String
- fDevice – String
- fPowerUsage – String
- fSwitchStatus – Boolean
+ Constructor Create (sSwitchID, sDevice : String;
                      iPowerUsage:Integer;
                      bSwitchStatus:Boolean)
+ GetSwitchID : String
+ ComputeEnergyUsed : Real
+ SetSwitchStatus
+ toString : String
+ DetermineSwitchStatus : String
```

5.4.1 List a method that is used to instantiate the object. (1)

5.4.2 Give an example of each of the following methods in the given class diagram:

(a) Accessor (1)

(b) Mutator (1)

5.4.3 What is the purpose of the toString method as shown in the class diagram? (1)

5.4.4 What do the minus (-) and plus (+) symbols in the class diagram represent respectively? (2)

TOTAL SECTION D: 25

SECTION F: INTEGRATED SCENARIO

QUESTION 6

A new shopping centre has been built in town. The project managers and developers want to incorporate Information and Communication Technologies in many areas of the centre.

6.1 Location-based computing offers both advantages and disadvantages to the consumers and the businesses operating within the centre.

6.1.1 Discuss TWO ways in which location-based computing can be utilised to enhance the shopping experience within the centre. (2)

6.1.2 State TWO disadvantages or risks associated with location-based data collection. (2)

6.2 The project manager makes use of a Wiki to centralise project material and information.

Name TWO challenges/disadvantages of using Wikis. (2)

6.3 Project management often makes use of distributed computing.

Briefly explain the concept *distributed computing*. (2)

6.4 The developers make use of an intranet to access internal databases and to collaborate on projects.

6.4.1 Explain what an *intranet* is. (1)

6.4.2 Some team members are complaining about information overload.

Explain what *information overload* is. (1)

6.4.3 The Internet of Things is a possible solution for information overloading.

Briefly explain what the *Internet of Things* is. (2)

6.5 Some team members have been cyberslacking.

6.5.1 Explain what is meant by *cyberslacking*. (2)

6.5.2 Suggest TWO measures that the team members can take to limit the time spent on social media. (2)

6.5.3 People often confuse the terms, social networking and social engineering.

Differentiate between *social networking* and *social engineering*. (2)

6.6 The project managers make use of blockchain technology.

6.6.1 Define the concept *blockchain technology*. (2)

6.6.2 Public key encryption plays a fundamental role in blockchain technology.

Briefly explain the process involved in public key encryption. (2)

6.7 The hotspots in the centre are often used by business people to connect to their company's VPN.

6.7.1 Write out the abbreviation VPN. (1)

6.7.2 Briefly explain what a *VPN* is. (2)

6.7.3 Explain how a VPN is often used for illegal purposes. (1)

6.8 Project management meetings often take place via Skype.

6.8.1 Skype makes use of encryption.

Define *encryption* and explain its purpose. (2)

6.8.2 List TWO indicators displayed by a browser which indicates a secure website. (2)

6.9 The developers warn consumers and businesses about cybercrime and cybergangs.

6.9.1 Explain what a *cybergang* is. (1)

6.9.2 Give TWO examples of cybercrime. (2)

6.9.3 List TWO measures consumers and businesses can take to safeguard themselves against cybercrimes. (2)

TOTAL SECTION F: 35
GRAND TOTAL: 150

ANSWER SHEET

ATTACH THIS PAGE TO YOUR ANSWER BOOK

NAME OF LEARNER: _____

SECTION D: DATA AND INFORMATION MANAGEMENT

QUESTION 4

4.5.1

tblManufacturers	
	ManufacturerID
	ManufacturerName
	ContactNumber
	OnlineSupport

tblGadgets	
	DeviceID
	DeviceName
	Category
	OperatingSystem
	Price
	NumInStock
	ProducerID

SECTION E: SOLUTION DEVELOPMENT

5.3.6

Step	Line no	iLoop	iSum	Output
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				

Province of the
EASTERN CAPE
EDUCATION

Iphondo leMpuma Kapa: Isebe leMfundo
Provinsie van die Oos Kaap: Department van Onderwys
Porafensie Ya Kapa Botjhabela: Lefapha la Thuto

NATIONAL SENIOR CERTIFICATE

GRADE 12

SEPTEMBER 2024

INFORMATION TECHNOLOGY P2 MARKING GUIDELINE

MARKS: **150**

This marking guideline consists of 13 pages.

SECTION A: SHORT QUESTIONS

QUESTION 1

1.1	1.1.1	Pharming ✓	(1)
	1.1.2	Application software ✓	(1)
	1.1.3	Filename extension ✓	(1)
	1.1.4	Bandwidth ✓	(1)
	1.1.5	SQL/Structured Query Language ✓	(1)
	1.1.6	BitTorrent ✓	(1)
	1.1.7	SEO or Search Engine Optimisation ✓	(1)
	1.1.8	Network Shaping ✓	(1)
	1.1.9	POP3/Post Office Protocol 3 ✓	(1)
	1.1.10	Normalisation ✓	(1)
1.2	1.2.1	B ✓ – (Comma Separated Values)	(1)
	1.2.2	C ✓ – (Object)	(1)
	1.2.3	C ✓ – (myArray[2])	(1)
	1.2.4	A ✓ – (Virtualisation)	(1)
	1.2.5	B ✓ – (6)	(1)
		TOTAL SECTION A:	**15**

SECTION B: SYSTEMS TECHNOLOGIES

QUESTION 2

2.1 2.1.1 ZIF/Zero Insertion Force ✓ (1)

2.1.2 Multiprocessing takes place when the operating system ✓divides the programs or threads or processes between multiple CPUs (physical chips or cores). ✓ (2)

2.1.3
- Fetching instructions and data from the memory (RAM) ✓
- Decoding the instructions ✓
- Executing the instructions ✓
- Transferring data back to the memory ✓ (4)

2.2 2.2.1 True ✓ (1)

2.2.2 False ✓ (1)

2.2.3 False ✓ (1)

2.2.4 True ✓ (1)

2.3 2.3.1 Caching is a method used to compensate for the loss of efficiency or bottleneck ✓ that happens when a faster medium tries to communicate with a slower medium. ✓ (2)

2.3.2
- CPU cache ✓ – is a high-speed memory on or close to the CPU that stores recently used data and instructions. ✓
- Disk cache ✓ – is a certain amount of RAM/memory built into storage (HDD/SSD) to use as cache which stores recently used data and instructions read from storage. ✓
- Web cache ✓ – is when recently visited webpages and images are stored on the HDD/SSD, which is used to open the webpage faster the next time the site is visited. ✓ (6)

2.4 2.4.1 Cloud computing refers to the process in which servers/computers on the Internet are used to store, manage and process data. ✓ (1)

2.4.2 **Any TWO:** ✓✓
- Ubiquity – as long as you have an internet connection, you will have access to the resources and services
- Scalability – processing power or storage capacities can be increased or decreased depending on needs
- Enables collaboration
- Outsources maintenance and upgrades of hardware
- Outsources software installation and upgrades (2)

2.5 **Any THREE:** ✓✓✓

The backup:

- Must include all important files and folders.
- Should be run regularly, preferably every day, but at least once a week.
- Store backups in multiple locations to mitigate the risk of data loss due to localised disasters or hardware failures.
- Consider both on-site and off-site locations for redundancy.
- Data should be verified occasionally to make sure the backup system is still working. (3)

TOTAL SECTION B: 25

SECTION C: COMMUNICATION AND NETWORK TECHNOLOGIES

QUESTION 3

3.1 3.1.1
- Internet is a worldwide/global computer network, consisting of devices, computers and networks connected to each other. ✓
- World Wide Web/WWW is a service that runs on the internet and is a vast/huge/large collection of interlinked, interactive documents stored in computers all over the world accessed via the Internet. ✓ (2)

3.1.2 Computers will have the ability to interpret metadata on webpages ✓ that will allow them to navigate the web intelligently without human intervention. ✓ (2)

3.2 3.2.1 **Any TWO differences:** ✓✓✓✓

Client-Server network	Peer-to-Peer LAN
Each computer in the network is either a client or a server.	All computers are peers (equals) and perform the same communication functions.
A server is required.	No server is necessary.
Faster performance.	Can have a slow performance.
Security is far more sophisticated.	Security is limited
More suitable for a larger number of computers.	Can only be used with a small number of computers.
A specialised network operating system has to be installed on the server side.	Software is cheaper as it is often built into many operating systems.
The rest of the computers in the network do not have to have large disk capacity and can have less powerful processor.	All computers have high specifications with larger disk capacity and powerful processors.
If the server crashes or if there is a cable fault, network dependent computers cannot be used.	Since there is no server, the machines can run as standalone computers should a network fault occur.
Needs a dedicated network administrator.	Does not need a dedicated network administrator.

(4)

3.2.2 **Any THREE:** ✓✓✓

- Susceptible to Electromagnetic Interference (EMI)
- Susceptible to attenuation (weakening of signal strength over a distance)
- Cross-talk: occurs when the magnetic fields in two wires that are close to one another can interfere with transmission
- Security risks: UTP cables are more susceptible to eavesdropping and tapping compared to shielded cables, as they do not offer the same level of protection against signal leakage.
- Limited immunity to noise: While twisted pair design helps reduce noise, UTP cables are still more susceptible to noise compared to shielded cables, which can impact signal quality in noisy environments. (3)

3.2.3 A network switch is used to connect computers in a network to a central location so that communication can occur. ✓
It directs the network traffic between devices connected to the network. ✓ (2)

3.2.4 A server is a computer that provides and shares resources to the network users. ✓
Workstation is a computer that uses network resources. ✓ (2)

3.2.5 Access Point / Wireless Access Point (WAP) / Wireless Router ✓ (1)

3.3 **Any THREE:** ✓✓✓

- Interference and signal loss: Wireless networks are susceptible to interference from other electronic devices, physical obstructions, and environmental factors like walls or metal objects.
- Security risks: Wireless networks are inherently more vulnerable to security breaches compared to wired networks.
- Limited range and coverage: Wireless networks have a limited range compared to wired networks.
- Slower speeds: In general, wired connections tend to offer faster and more reliable speeds compared to wireless connections.
- Cost of implementation and maintenance: Setting up a wireless network can be more expensive than a wired network due to the need for specialised equipment such as routers, access points, and network adapters. (3)

3.4 A router makes communication between networks over the internet possible ✓ by directing data to its correct destination. ✓

OR

The router directs/redirects/sends data over a network ✓ and chooses the best route to the destination. ✓ (2)

3.5
- HAN: Home Area Network is a small network within a home environment. ✓
- PAN: A computer network with a range of a few metres that is organised around an individual. ✓ (2)

3.6 Clickfarm or Clickfarming ✓ (1)

TOTAL SECTION C: 24

SECTION D: DATA AND INFORMATION MANAGEMENT

QUESTION 4

4.1 4.1.1 Anomaly refers to problems or errors found in databases due to bad database design. ✓ (1)

4.1.2
- Insert anomaly ✓
- Delete anomaly ✓
- Update anomaly ✓ (3)

4.2
- The table does not have a primary key ✓
- Multiple valued attributes in address field ✓
- Repeating groups of information in vehicle registration fields ✓ (3)

4.3 4.3.1 **Any TWO:** ✓✓
RFID can be used for:
- Inventory management: RFID tags can be attached to products or packaging, allowing businesses to track inventory in real-time.
- Supply chain visibility: RFID enables businesses to track the movement of goods throughout the supply chain.
- Asset tracking: RFID tags can be used to track and manage valuable assets.
- Access control and security: Allowing authorised personnel to enter restricted areas or access specific resources.
- Retail and Point-of-Sale (POS) Systems: The use of RFID tags on merchandise to enhance the checkout process by enabling faster and more accurate scanning of items. (2)

4.3.2 **Any THREE:** ✓✓✓
- Multiple RFID tags can be read at once.
- Read tags even if they are inside boxes or hidden from view (as long as they are in range of the scanner)
- Interact with the data and software stored on a tag.
- Use the tag to collect and broadcast data about the environment (e.g. temperature, humidity etc.).
- Read tags even if they are moving at a speed, e.g. on toll roads (3)

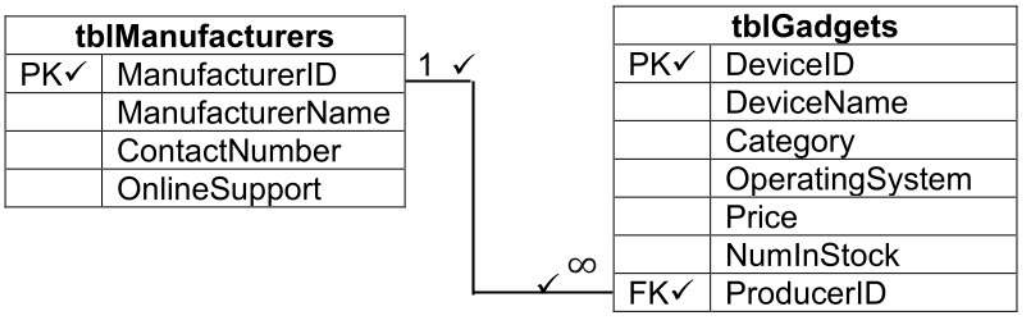
4.4 4.4.1 Data mining refers to the process of analysing large datasets ✓ to uncover patterns ✓ that can be used to make informed decisions. ✓ (3)

4.4.2 Data mining algorithms analyse user interactions, such as likes, shares, comments and browsing history, ✓ to recommend relevant content, connect users with similar interests, and improve overall user engagement. ✓ (2)

4.4.3 **Any TWO:** ✓✓

- **Privacy Breach:** There is a risk of breaching individuals' privacy if this data is accessed, used or shared without their consent.
- **Data Security:** Storing and processing large amounts of data collected from social media platforms pose security risks. Unauthorised access, data breaches, or cyber-attacks could compromise the integrity and confidentiality of the data, leading to potential misuse or exploitation.
- **Bias and discrimination:** Algorithms used in social media data mining may perpetuate biases present in the data they are trained on which can lead to discriminatory outcomes, such as targeting specific groups unfairly or reinforcing stereotypes, which can have negative societal impacts.
- **Reputation damage:** Misinterpretation or misuse of social media data can lead to incorrect conclusions or assumptions about individuals or groups which can result in reputational damage. (2)

4.5 4.5.1



(5)

4.5.2 (a) Currency ✓ (1)

(b) Yes/No ✓ also accept True/False **OR** Boolean (1)

TOTAL SECTION D: 26

SECTION E: SOLUTION DEVELOPMENT

QUESTION 5

5.1 5.1.1 The program compiles and runs when executed ✓ but it produces incorrect results/output. ✓ (2)

5.1.2 Designing and coding software to prevent, detect, and handle errors. ✓ (1)

5.2 Array is not sorted. ✓ (1)

5.3 5.3.1 SpinEdit ✓ (1)

5.3.2 Inc(iSum ✓, iLoop ✓); (2)

5.3.3 (a) {1} iSum := 0; ✓ (1)

(b) {4} IntToStr(iSum) ✓ (1)

5.3.4 IntToStr ✓ (iEndValue – iStartValue + 1) ✓; (2)

5.3.5 Any ONE of:

```
iLoop := iStartValue; ✓
While iLoop ✓ <=  iEndValue ✓ do
begin
   iSum := iSum + iLoop;
   inc(iLoop); ✓
end;
```

OR

```
iLoop := iStartValue; ✓
Repeat
   iSum := iSum + iLoop;
   inc(iLoop); ✓
Until iLoop ✓ > iEndValue; ✓
```

(4)

5.3.6

Step	Line No ✓	iLoop ✓	iSum ✓	Output ✓
1	1		0	
2	2	4		
3	3		4	
4	2	5		
5	3		9	
6	2	6		
7	3		15	
8	4			The sum is 15
9	5			The loop is executed 3 times

One mark per correct column.
Mark step 9 positive from QUESTION 5.3.4 (4)

5.4 5.4.1 Constructor Create ✓ (1)

5.4.2 (a) GetSwitchID : String ✓ (1)

(b) SetSwitchStatus ✓ (1)

5.4.3 Returns the values held in each of the attributes / fields ✓ (1)

5.4.4
- - Private section /Fields section/Attributes section ✓
- + Public section/Method section ✓ (2)

TOTAL SECTION D: 25

SECTION F: INTEGRATED SCENARIO

QUESTION 6

6.1 6.1.1 ***Any TWO*** *OR any other correct/relevant response.* ✓✓

- Personalised promotions: Utilise location-based data to deliver personalised promotions and offers to shoppers based on their location within the centre.
- Indoor navigation: Implement indoor navigation systems powered by location-based computing to help shoppers easily find their way around the centre.
- Product recommendations: Utilise location data to provide shoppers with relevant product recommendations based on their current location and past purchase history.
- Que management: Use location-based data to optimise queue management and reduce wait times at checkout counters or popular attractions within the centre.
- Click-and-collect services: Enable click-and-collect services by integrating location-based technology into the order fulfilment process. Shoppers can place orders online and select a convenient pickup location within the centre. (2)

6.1.2 ***Any TWO*** *OR any other correct/relevant response.* ✓✓

- Privacy risks: Users may feel uncomfortable knowing that their movements are being tracked.
- Security vulnerabilities: Storing and transmitting location data can pose security risks if proper encryption and protection measures are not in place.
- Accuracy issues: Location data collected from mobile devices or GPS systems may not always be accurate.
- Battery drain: Constantly tracking and transmitting location data can drain device batteries quickly.
- Ethical concerns: There are ethical considerations surrounding the collection and use of location data.
- Legal and regulatory compliance: Compliance with various laws and regulations is necessary when collecting and processing location data.
- Data overload: Collecting large volumes of location data can lead to data overload, making it challenging to analyse and derive meaningful insights.
- Dependency on infrastructure: Location-based data collection relies heavily on infrastructure such as GPS satellites, cellular networks, and internet connectivity. (2)

6.2 ***Any TWO*** *OR any other correct/relevant response.* ✓✓

- Quality of information
- Bias of editors
- Accountability problems (2)

6.3 Distributed computing refers to computer projects where hundreds or even thousands of computers ✓across the world work together to solve a problem. ✓

OR

Distributed computing is a system whereby the resources of different computers are shared ✓ and used at the same time to solve a single problem. ✓ (2)

6.4 6.4.1 Intranet is a private network that offers access to employees of a company. ✓ (1)

6.4.2 **Any ONE** ✓

- *Information overload* refers to the situation where individuals or organisations are presented with more information than they can effectively process or utilise.
- *Information overload* occurs when the volume of available information exceeds the capacity of an individual or a system to absorb and make sense of it within a given timeframe. (1)

6.4.3 Internet of Things refers to the concept that more and more devices and objects are connected to the internet ✓ with the ability to communicate and make intelligent decisions. ✓ (2)

6.5 6.5.1 Cyberslacking refers to the use of internet or work computers ✓ during work hours for personal purposes. ✓ (2)

6.5.2 **Any TWO** *OR any other correct/relevant response.* ✓✓

- Set specific time limits: Allocate a specific amount of time each day for social media use and stick to it.
- Designate social media-free zones: Establish certain areas or times where social media use is strictly prohibited.
- Disable notifications: Turn off notifications for social media apps to avoid constant interruptions and temptations to check them frequently.
- Create accountability partnerships: Pair up with a colleague or friend and hold each other accountable for staying off social media during designated times.
- Use Website Blockers: Install browser extensions or apps that block access to social media websites during work hours or other specified times.
- Find alternative activities: Replace social media browsing with other productive or enjoyable activities, such as teambuilding exercises.
- Prioritise tasks: Create a to-do list or schedule for the day, prioritising important tasks over social media browsing.
- Do not save your username and password, so that you are forced to enter these each time.
- Unfollow or mute people who fill your social media page with useless information. (2)

6.5.3
- *Social networking* is an online platform that allows users to create a public profile and interact with other users on the website. ✓
- *Social engineering* is the act of tricking someone into giving information or taking action they usually would not take. ✓ (2)

6.6 6.6.1 Blockchain technology refers to a growing list of records called blocks ✓ that are linked using cryptography. ✓ (2)

6.6.2 Public key encryption uses mathematical algorithms to create two separate keys for the encryption/decryption process. ✓
One key is private and the other is public. ✓ (2)

6.7 6.7.1 Virtual Private Network ✓ (1)

6.7.2 VPN allows users to log into a network via the internet ✓ with the same security of a LAN. ✓ (2)

6.7.3 Spoofing a location so that a person can log into sites that block access from IP addresses outside their country. ✓ (1)

6.8 6.8.1 Encryption is the scrambling of text or data using a specified set of rules ✓ to ensure the privacy of data during communication or for security purposes. ✓ (2)

6.8.2
- HTTPS ✓
- Closed pad lock ✓ (2)

6.9 6.9.1 Cybergang is a group of people who uses ICT to commit a crime. ✓ (1)

6.9.2 ***Any TWO*** *OR any other correct/relevant response.* ✓✓
- Hacking
- Phishing
- Identity theft
- Ransomware attacks
- Denial-of-service (DDoS) attacks (2)

6.9.3 ***Any TWO*** *OR any other correct/relevant response.* ✓✓
- Installing and updating anti-virus software
- Using a firewall
- Keeping all your software up-to-date
- Being aware of current trends in computer crime
- Applying common sense
- Following a good password policy (2)

TOTAL SECTION F: 35
GRAND TOTAL: 150