MATRIC EXAM REVISIONS
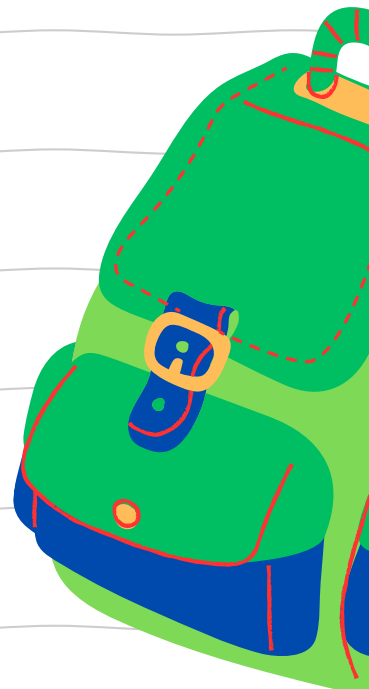
INFORMATION TECHNOLOGY PAPER 2 **(2019)**

basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

**NATIONAL
SENIOR CERTIFICATE**

GRADE 12

INFORMATION TECHNOLOGY P2

NOVEMBER 2019

MARKS: 150

TIME: 3 hours

This question paper consists of 15 pages.

INSTRUCTIONS AND INFORMATION

1.   This question paper consists of SIX sections:

        SECTION A: Short questions   (15)
        SECTION B: System Technologies   (25)
        SECTION C: Communications and Network Technologies   (30)
        SECTION D: Data and Information Management   (20)
        SECTION E: Solution Development   (20)
        SECTION F: Integrated Scenario   (40)

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　　Various options are provided as possible answers to the following questions. Choose the answer and write only the letter (A–D) next to the question numbers (1.1.1 to 1.1.5) in the ANSWER BOOK, e.g. 1.1.6 D.

　　1.1.1　　The process used to reverse a database transaction and restore the data to a previous state is called …

　　　　A　　default state revert.
　　　　B　　revert.
　　　　C　　state restore.
　　　　D　　rollback.　　　　　　　　　　　　　　　　　　　　(1)

　　1.1.2　　The technology that combines JavaScript with a browser command and allows the browser to update only a small part of a web page is called …

　　　　A　　XML.
　　　　B　　AJAX.
　　　　C　　IMAP.
　　　　D　　JVM.　　　　　　　　　　　　　　　　　　　　　(1)

　　1.1.3　　A type of reasoning that works with probabilities in order to arrive at a decision is called …

　　　　A　　alternative logic.
　　　　B　　system logic.
　　　　C　　fuzzy logic.
　　　　D　　design thinking.　　　　　　　　　　　　　　　　(1)

　　1.1.4　　A method of encryption that utilises two separate keys to encrypt and decrypt data is known as …

　　　　A　　SSL.
　　　　B　　private key encryption.
　　　　C　　hashing.
　　　　D　　public key encryption.　　　　　　　　　　　　　(1)

　　1.1.5　　… is a built-in Delphi function that returns the integer part of a floating point number.

　　　　A　　`Val()`
　　　　B　　`Sqr()`
　　　　C　　`Trunc()`
　　　　D　　`Frac()`　　　　　　　　　　　　　　　　　　　　(1)

1.2   Choose a term from COLUMN B that matches the description in COLUMN A. Write only the letter (A–T) next to the question numbers (1.2.1 to 1.2.10) in the ANSWER BOOK, e.g. 1.2.11 U.

COLUMN A		COLUMN B	
1.2.1	A technology that allows the definition of styles based on certain formatting rules that can be used by HTML files to alter the appearance of web pages	A	client
		B	attenuation
		C	AUP
1.2.2	Software that enables an operating system to control and communicate with a hardware device	D	topology
		E	ASCII
		F	driver
1.2.3	A term that refers to the physical layout of computers in a network	G	full backup
1.2.4	Hardware and/or software that monitors the traffic between a computer and the internet to safeguard against security breaches	H	database analyst
		I	computer worm
		J	CSS
		K	incremental backup
1.2.5	A type of backup whereby backup files are made only of new files and files that have been modified since the last backup	L	FTP
		M	peer
1.2.6	Computers in a network that use but do not provide network resources	N	firewall
		O	EMI
1.2.7	A professional person who is responsible for the management and maintenance of databases	P	EULA
		Q	RAID
		R	DBA
1.2.8	A type of malware that self-replicates over a network without the need of a host file	S	crosstalk
		T	Trojan
1.2.9	The term that describes the loss of signal strength in a network medium over a distance		
1.2.10	A policy document that specifies the rights and responsibilities of users within a network or work-related environment		

(10 x 1)   **[10]**

TOTAL SECTION A: 15

SECTION B: SYSTEM TECHNOLOGIES

QUESTION 2

A few learners from an IT class have decided to help their community by developing free educational apps as part of a community project.

2.1   The learners have to decide which laptop computer to purchase to develop the apps. The specifications of two laptop computers are as follows:

LAPTOP COMPUTER 1	LAPTOP COMPUTER 2
- 15 inch HD display - Intel Core i3-6006U - 4GB DDR3-1600 - WD Blue 1 TB 7200 RPM	- 15,6 inch HD display - Intel Core i5-8250U - 2 x 4GB DDR3-1600 - 1,5 TB 7200 RPM

      2.1.1   State the amount of RAM that is included with **Laptop Computer 2**.   (1)

      2.1.2   Is **Laptop Computer 1** bundled with a solid-state drive or a hard disk drive? Motivate your answer.   (2)

      2.1.3   **Laptop Computer 2** has 1,5 TB of storage space. Give the size of the storage space in gigabytes.   (1)

2.2   The CPU, also known as the processor, does most of the processing in a computer system.

      2.2.1   CPUs work according to a sequence of steps called the machine cycle. Name the first TWO steps of the machine cycle.   (2)

      2.2.2   Modern operating systems are capable of performing many different processing techniques. Briefly explain the term *multithreading*.   (2)

2.3   The IT learners often discuss the features of the latest graphics cards.

      2.3.1   Name TWO factors of a graphics card that affect its graphics processing ability.   (2)

      2.3.2   Many laptop computers have a built-in (or integrated) graphics adapter and a graphics card.

            Give TWO reasons why laptops are designed this way.   (2)

2.4   The BIOS, which includes POST, plays a major role in the boot-up process of a computer.

      2.4.1   What does the acronym *POST* stand for?   (1)

      2.4.2   Briefly explain the role of POST in the boot-up process of a computer.   (1)

2.5   The learners are considering making their apps available for mobile devices, such as smartphones.

       2.5.1   Define the term *convergence*.   (1)

       2.5.2   How can the learners use *virtualisation* to their advantage in developing the mobile apps?   (1)

2.6   Computer systems can encounter slow performance when running educational apps due to the overuse of virtual memory.

      State TWO ways in which to address the problem related to virtual memory.   (2)

2.7   Desktop computer hardware can be extended easily.

       2.7.1   What is the purpose of the ZIF socket on a motherboard?   (1)

       2.7.2   Most computer peripherals are hot swappable. Explain what is meant by the term *hot swappable*.   (1)

2.8   The learners want to release their educational apps as freeware, but there are many other types of software licenses, such as shareware.

       2.8.1   Explain what the use of shareware entails.   (2)

       2.8.2   Many software development companies use the SaaS distribution model.

            (a)   Explain how SaaS works.   (1)

            (b)   Name ONE advantage of the use of SaaS.   (1)

2.9   A common problem associated with the use of hard drives is disk fragmentation.

      What is *disk fragmentation*?   (1)

TOTAL SECTION B: **25**

SECTION C: COMMUNICATIONS AND NETWORK TECHNOLOGIES

QUESTION 3

You started a freelance business and need to set up a network for the business.

3.1   When setting up a small office network, some possible essential pieces of equipment could include cables and routers.

      3.1.1   Name ONE type of network cable that could be used.   (1)

      3.1.2   Explain the purpose of a router.   (2)

3.2   It has been suggested that you consider a wireless set-up for your network.

      3.2.1   Name TWO benefits of a wireless network.   (2)

      3.2.2   Access points in wireless networks are essential.

              Explain what an *access point* is.   (2)

3.3   Wireless networks are prone to piggybacking.

      3.3.1   Explain what *piggybacking* entails.   (1)

      3.3.2   Suggest TWO ways in which a network can be protected from piggybacking.   (2)

3.4   You plan on developing a website to be used as part of your marketing strategy.

      3.4.1   Explain the benefit of a dynamic website. Refer to the properties of a dynamic website in your answer.   (3)

      3.4.2   How can you ensure that your website will appear in a search list, even if your business type is not really relevant to the search?   (1)

      3.4.3   You decided to use the HTTPS protocol.

            (a)   What is a *protocol*?   (2)

            (b)   Motivate why it is more advisable to use the HTTPS protocol than the HTTP protocol.   (1)

3.5   You need to access your business files, which are stored on your home network, from any location.

      3.5.1   Explain why the use of a PAN will NOT be suitable.   (1)

      3.5.2   Give TWO reasons why the use of a VPN will be more suitable.   (2)

3.6   You decided to use rich internet applications (RIA) to save on expenses.

      3.6.1   Explain what *RIA* is.   (2)

      3.6.2   Give an example of a RIA.   (1)

3.7   Mobile apps have become a trending phenomenon, driven by an increasing reliance on mobile devices.

      Give TWO reasons why you should consider creating an app for your business to be used on a mobile device.   (2)

3.8   Location-based computing can be useful for your business.

      3.8.1   What is *location-based computing*?   (1)

      3.8.2   What type of technology is used to implement location-based computing?   (1)

3.9   Freelancers are constantly on the move and often use podcasts to stay up to date with the most recent developments in their respective fields while travelling.

      3.9.1   What is a *podcast*?   (2)

      3.9.2   Podcasts are often streamed. Explain the concept of *streaming*.   (1)

TOTAL SECTION C: 30

SECTION D: DATA AND INFORMATION MANAGEMENT

QUESTION 4

A small local business operating from a single site store their business data in a database with two tables called **tblClients** and **tblOrders**.

The table design for the **tblClients** table is as follows:

Field Name	Data Type
ClientSAID	Short Text
LastName	Short Text
FirstName	Short Text
ContactNumber	Short Text

NOTE: The ClientSAID field in the **tblClients** table contains the client's 13-digit South African identity number.

The table design for the **tblOrders** table is as follows:

Field Name	Data Type
InvoiceNumber	Short Text
ClientSAID_Ref	Short Text
Amount	Currency
Paid	Yes/No

NOTE: The ClientSAID_Ref field in the **tblOrders** table contains the client's 13-digit South African identity number.

4.1　　No primary key is indicated.

　　　　Name the distinct property of a primary key in a table.　　　　　　　　　　(1)

4.2　　Only orders with the value of an amount of at least R500,00 will be inserted into the **tblOrders** table. Suggest a data validation technique that can be used to enforce this condition.　　　　　　　　　　(1)

4.3　　No relationship is indicated between the **tblClients** table and the **tblOrders** table.

　　　　4.3.1　　Which fields can be used to set a relationship between the tables?　　(1)
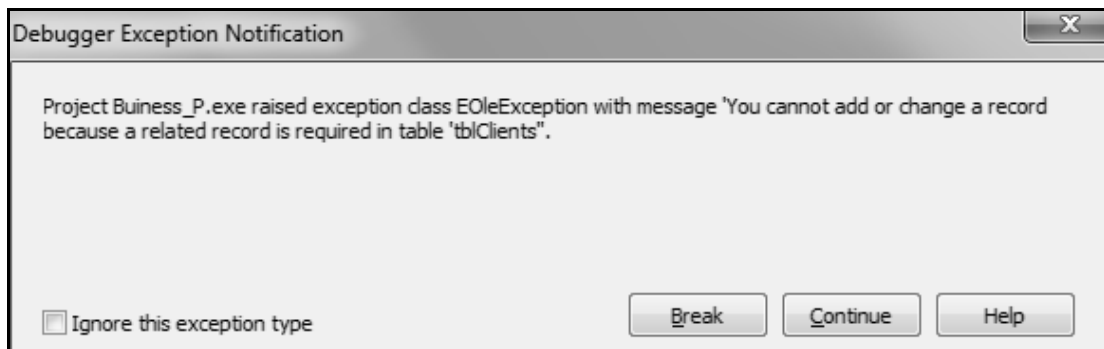
　　　　4.3.2　　Identify the type of relationship which will be formed AND indicate the table that will appear on each side of the relationship.　　(2)

4.4　　A suggestion has been made to add the client's age, **ClientAge**, as an additional field to the **tblClients** table.

　　　　Evaluate why this suggestion would lead to a poor table design.　　　　　(1)

4.5　　Suggest whether the business should use a desktop or a server database management system. Motivate your answer.　　　　　　　　　　(2)

4.6   The following error message is displayed when you want to insert a record in the **tblOrders** table:

Debugger Exception Notification

Project Buiness_P.exe raised exception class EOleException with message 'You cannot add or change a record because a related record is required in table 'tblClients".

☐ Ignore this exception type   Break   Continue   Help

4.6.1   Is the error message above caused by a syntax, runtime or logical error?   (1)

4.6.2   Name the database design concept related to the error message above.   (1)

4.7   A decision has been made that data mirroring will be used for the database.

Define the term *mirroring*.   (1)

4.8   As a business owner, it is important to have a good password policy.

Suggest TWO guidelines for a good password policy in terms of the compilation of passwords.   (2)

4.9   One of your clients enquired about his personal information that was used to send him messages from unknown sources. You answered, 'It is invisible data capturing.'

What is meant by the term *invisible data capturing*?   (2)

4.10   Using a data warehouse will enable you to do data mining.

Explain the concept of *data mining*.   (1)

4.11   The business will be audited for tax purposes.

Briefly discuss how an audit trail can be used to assist the auditing firm in their investigation.   (2)

4.12   Record locking is a mechanism used in most databases.

Explain how *recordlocking* works.   (2)

TOTAL SECTION D: 20

SECTION E: SOLUTION DEVELOPMENT

QUESTION 5

5.1   Write down the most appropriate data types for variables to be used for the following scenarios:

5.1.1   A South African cellphone number needs to be stored, e.g. 083 112 4393.   (1)

5.1.2   A system needs to keep track of the number of times a client has placed an order.   (1)

5.2   The following programming statements have been provided:

```
K = 10;
L = 5.0;
M = False;
```

Evaluate the following expressions and indicate if it will result in `True` or `False`.

Show ALL steps.

5.2.1   `NOT ((K > L) OR (M))`   (2)

5.2.2   `(M = NOT True) AND (L = K / 2)`   (2)

5.3   Consider the following Delphi code and answer the questions that follow:

```
1   var
2     n, k: integer;
3     sOut: String;
4   begin
5     k := 2;
6     sOut := IntToStr(k);
7
8     for n := 0 to 4 do
9       begin
10        k := k * 2;
11        sOut := sOut + ', ' + IntToStr(k);
12      end;
13
14    ShowMessage(sOut);
15  end;
```

5.3.1   What is the value of `sOut` before the loop has been executed?   (1)

5.3.2   How many times will the loop be repeated?   (1)

5.3.3   What will be the value of `k` when the variable `n` reaches the value of 1?   (2)

5.4 Specify the correct minimum AND maximum values that can be generated as a result of the following Delphi statement:

```
iRandomNumber := Random(8) + 5;
```
(2)

5.5 Name a built-in Delphi function that will consistently round up a decimal number, such as 47.3 or 34.5, to the next whole number. (1)

5.6 A linear search, also known as sequential search, is one of the most popular search algorithms, but can be inefficient.

Give ONE reason why a linear search can sometimes be considered to be inefficient. (1)

5.7 An algorithm must be developed to display an output of stars when any string of digits is entered as text, as shown in the examples below.

Example of output if the input was '534':

```
* * * * *
* * *
* * * *
```

Example of output if the input was '49813':

```
* * * *
* * * * * * * *
* * * * * * *
*
* * *
```

Complete the algorithm below to produce the correct output according the string of digits that was entered, as explained above.

```
Display 'Please enter a string of digits'
sInput ← input
...
```
(6)

TOTAL SECTION E: 20

SECTION F: INTEGRATED SCENARIO

QUESTION 6

Freelancing is becoming more popular as people prefer to work from home. There are hundreds of freelance job opportunities available on the internet.

6.1   Freelance jobs are often done from a mobile office.

       6.1.1   Define the term *mobile office*.   (2)

       6.1.2   How will a freelancer benefit from using a mobile office?   (1)

6.2   The following conclusion was published in a report based on a survey about freelancing in the media industry:

> 'In line with the fact that the majority of freelancers work in the digital/online space, it makes sense that social media is considered an important marketing tool for creative entrepreneurs. 32% of respondents cite Facebook as their primary marketing platform, followed by LinkedIn.'
>
> [Adapted from internet source]

       6.2.1   What is the common term used for digital/online space?   (1)

       6.2.2   Give TWO examples of online data storage services.   (2)

       6.2.3   When working with dynamic web pages, the term 'online storage' is used often. This refers to storage on a web server.

               Give TWO other examples of files that would be saved online for use by a dynamic web page, apart from database files.   (2)

       6.2.4   Explain the purpose of the LinkedIn media platform.   (1)

       6.2.5   State TWO guidelines for protecting users' privacy when using social media platforms.   (2)

6.3   Data synchronisation is of the utmost importance for freelancers on the move.

       Briefly explain what *data synchronisation* entails.   (2)

6.4   Different types of hardware and software are required to conduct video conferences for the purpose of freelancing.

       6.4.1   State TWO main advantages of modular design in hardware.   (2)

       6.4.2   Name a device that can be attached to a personal computer to conduct a video conference.   (1)

6.5   An NGO company does research on weather patterns. Therefore they require a lot of computer processing power.
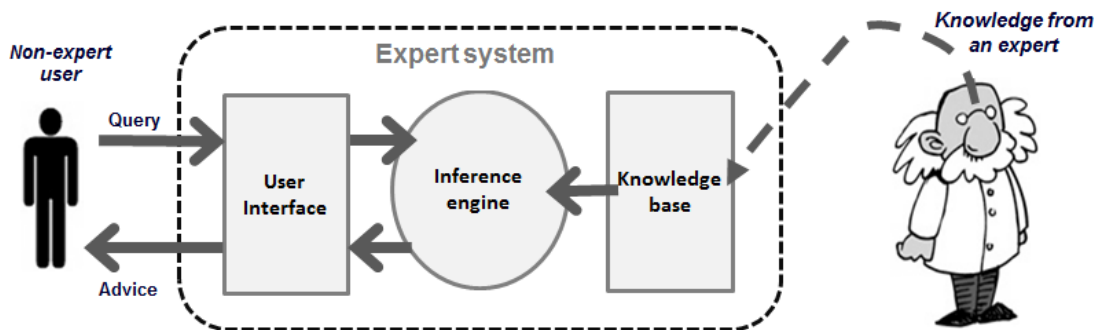
They decide to use distributed computing.

6.5.1   Describe the term *distributed computing*.   (2)

6.5.2   Briefly describe how the general public can become involved in distributed computing.   (2)

6.6   An expert system is an application of AI.

6.6.1   What does *AI* stand for in this context?   (1)

6.6.2   Many freelancers use their skills to develop software.

Explain, with reference to the diagram above, why a rule-based system, such as an expert system, can be developed without the developer being an expert in a specific field.   (2)

6.7   Cyber security is very important, especially for freelancers who often rely on the internet to save and process their data.

6.7.1   Malware threats can be reduced by updating your software.

(a)   State the TWO types of software that should be updated.   (2)

(b)   Explain for EACH type of software in QUESTION 6.7.1(a) why updating the software would prevent malware threats.   (2)

6.7.2   Define the term *ransomware*.   (2)

6.8   Website developers need to guard against many types of cybercrime.

    6.8.1   Explain the concept of a *DDoS attack*.   (2)

    6.8.2   Give the term used for an amateur programmer who modifies virus templates and then releases it.   (1)

6.9   A reliable backup and compression system is important to save data.

    6.9.1   A UPS is one way of securing data.

        Briefly explain what an *uninterruptable power supply (UPS)* entails.   (1)

    6.9.2   State how a UPS is able to secure data.   (1)

    6.9.3   What type of compression sacrifices insignificant data to conserve space?   (1)

6.10   DRM technologies were developed in response to the rapid increase in online piracy of commercially marketed material, which increased through the widespread use of peer-to-peer file sharing applications.

    6.10.1   What does *DRM* stand for?   (1)

    6.10.2   Name ONE popular and well-known example of a protocol that uses peer-to-peer file sharing over the internet.   (1)

6.11   The modern smartphone is an essential device for freelancers.

    6.11.1   Suggest TWO practical tips for freelancers to keep their smartphone batteries charged for a longer period of time.   (2)

    6.11.2   Freelancers can use their smartphones to make video calls with apps that utilise VoIP.

        State ONE other disadvantage that is associated with the use of VoIP, other than the use of battery power.   (1)

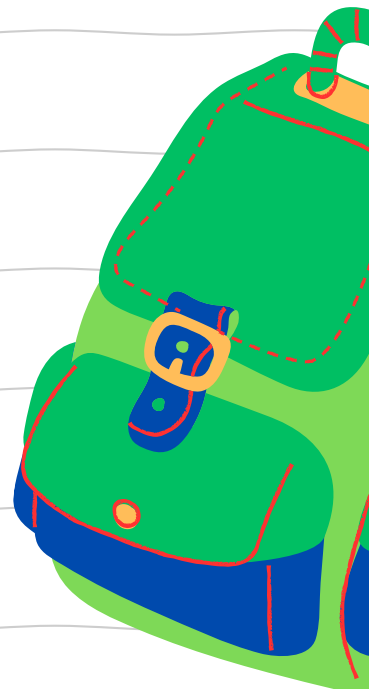**TOTAL SECTION F: 40**
GRAND TOTAL: 150
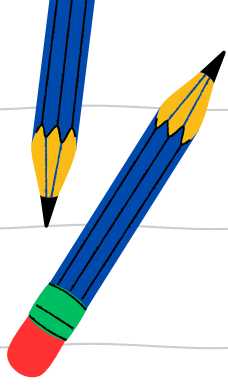
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INFORMATION TECHNOLOGY
PAPER 2 (2019)

ANSWER PAPER

NATIONAL
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GRADE 12

INFORMATION TECHNOLOGY P2

NOVEMBER 2019

MARKING GUIDELINES

MARKS: 150

These marking guidelines consist of 15 pages.

SECTION A: SHORT QUESTIONS

QUESTION 1

1.1	1.1.1	D ✓		(1)
	1.1.2	B ✓		(1)
	1.1.3	C ✓		(1)
	1.1.4	A or D ✓		(1)
	1.1.5	C ✓		(1)
1.2	1.2.1	J ✓	CSS	(1)
	1.2.2	F ✓	Driver	(1)
	1.2.3	D ✓	Topology	(1)
	1.2.4	N ✓	Firewall	(1)
	1.2.5	K ✓	Incremental backup	(1)
	1.2.6	A ✓	Client	(1)
	1.2.7	R ✓	DBA	(1)
	1.2.8	I ✓	Computer worm	(1)
	1.2.9	B ✓	Attenuation	(1)
	1.2.10	C ✓	AUP	(1)

TOTAL SECTION A: 15

SECTION B: SYSTEM TECHNOLOGIES

QUESTION 2

2.1.1   8/ 2 x 4 GB ✓   (1)

2.1.2   HDD ✓

                                                                                                                   (2)
         RPM/ spinning disk/ moving parts/ rotation speed. ✓

2.1.3   1500 - 1536 GB / gigabytes ✓   (1)

2.2.1   Fetch ✓instructions and data from memory (RAM).
         Decode ✓the instructions.   (2)

2.2.2   Programs are split into smaller tasks called threads. ✓
         Threads can be run simultaneously as if they are separate independent   (2)
         programs. ✓

2.3.1   *Any TWO*: ✓✓
         •   Speed of processing cores/ processing power/ clock speed.
         •   Number of processing cores/ pipelining.
         •   Amount of memory/ dedicated memory.
         •   Type of RAM
         •   GPU Cache
         •   The speed of its communication with the motherboard/
             Whether it is installed into a PCI-Express x 8 or PCI Express x 16 slot.   (2)

2.3.2   The built-in graphics adapter is used when performing tasks that don't require
         intense graphics processing✓ to conserve battery power. ✓
         When programs are executed that require more intense graphics processing, the
         laptop switches over to use the graphics card.

         ANY TWO Concepts
         •   Improved graphics processing
         •   Conserve battery power
         •   Decrease the load of the CPU
         •   Cannot Add/Upgrade the graphics card in the laptop   (2)

2.4.1   Power On Self Test ✓   (1)

2.4.2   POST checks/tests that all important hardware (RAM, HDD, etc.) is working✓   (1)

2.5.1   Separate technologies and functions are combined into a single multi-purpose
         device. ✓   (1)

2.5.2   They can emulate/ test different smartphones/OS/platforms on a computer. ✓   (1)

2.6 *Any TWO*: ✓✓
- Close unnecessary programs to free up memory.
- Add more RAM to your computer.
- Ensure that you run a 64-bit operating system. Otherwise you can't use more than 4 GB.
- Replace with a faster storage (SSD). (2)
- The use of the cloud/server for storage/processing

2.7.1 To connect/house the CPU. ✓ (1)

2.7.2 Hardware can be added or removed while the computer is on. ✓ (1)

2.8.1 *Any TWO*: ✓✓
- Limited features / full version subject to time-limit.
- License must be bought to use full version.
- Available as a trial version/ try before buy
(2)

2.8.2 (a) A regular (usually monthly) subscription fee is paid to use the software/ (1) rented software. ✓

(b) *Any ONE*: ✓
- User always gets the latest version of the software.
- Only pay for what you use/ scalability of software
- Processed in another place like cloud/ server/ another location
- Saves storage space/ no need to install on hard drive
- No need for backups
- Accessibility on different devices/ locations (1)

2.9 The scattering/ spreading of parts of a file ✓ to several sectors on the disk which slows down the disk's data access speed.
(1)

TOTAL SECTION B: 25

SECTION C: COMMUNICATION AND NETWORK TECHNOLOGIES

QUESTION 3

3.1   3.1.1   UTP / STP/ Ethernet cable/ Fibre ✓   (1)

         3.1.2   The router directs/redirects/sends data over a network✓ and chooses the best route to the destination ✓

                 Concepts
                     • Transferring data between networks/ Internet
                     • Finding the correct destination/redirecting   (2)

3.2   3.2.1   *Any TWO*: ✓✓
                     • Easy to set up a wireless network
                     • It is easy to add new / more devices.
                     • Lower setup cost.
                     • Increased mobility/ Provides flexible layout to users of wireless/mobile devices.
                     • Provides a connection where cabling is not possible.

                       Any answer related to no cables needed   (2)

         3.2.2   It is a sender and receiver with an antenna ✓to send and/or receive radio waves. ✓

                 *Any TWO c*oncepts
                     • Connection to the Internet/network/wifi
                     • Send and receive signals
                     • Uses radio waves   (2)

3.3   3.3.1   Gaining access to and using someone else's Internet connection unlawfully/ without permission. ✓   (1)

         3.3.2   *Any TWO*: ✓✓
                     • Don't keep the default password – replace it with a good original password.
                     • Change the password on a regular basis/ good password policy
                     • Don't leave your Wi-Fi connection open – secure it with a password/ use a password
                     • Limit the amount of data/devices/list of users
                     • Make the hotspot invisible
                     • Verification of the Mac address
                     • Limit the range
                     • Switch off when not in use   (2)

3.4	3.4.1	The website uses the saved preferences of a user to generate the site/ It will differ for every user/ This personalizes the user experience of your business. ✓
		Interactivity✓
		Easy updates ✓
		
		Any 3 concepts
		  • Personalisation/ Differs for all users
		  • Generated on the server
		  • Based on parameters
		  • Interactivity
		  • Easy to manage content
			(3)

	3.4.2	Make use of search engine optimisation(SEO)	(1)
	3.4.3(a)	A set of rules ✓ for encoding and decoding of data for transfer ✓	(2)
	3.4.3(b)	It is a secure ✓ protocol for transactions	(1)
3.5	3.5.1	PAN: has a range of a few metres/ limited/ small range✓	(1)
	3.5.2	VPN: virtual private network – uses the Internet / public network✓ , Sign in with same privacy/ same security as a LAN ✓	(2)
3.6	3.6.1	Web application ✓ with functions and properties of traditional applications / software. ✓	(2)

	3.6.2	*Any ONE:* ✓
		  • Google Docs
		  • Microsoft Office Live
		  • Office 365
		  • Microsoft Office 365
			(1)

3.7		*Any TWO:* ✓✓
		  • Ease of use/ convenience
		  • Accessibility
		  • Marketing of business by app stores
		  • Notifications
		  • Using extra sensors/ functions/ properties in mobile device
			(2)

3.8	3.8.1	Processing, where the physical location✓ of objects /devices / persons is used.	(1)
	3.8.2	GPS ✓	(1)

3.9　　3.9.1　　A podcast is an audio file/recording ✓ available on the
internet/network for download✓ (2)

　　　　3.9.2　　*Any ONE*: ✓
- Real-time delivery of media content to a receiving device.
- Playing a file from an online source where the file is not permanently saved on the receiving device. (1)

TOTAL SECTION C:　30

SECTION D: DATA AND INFORMATION MANAGEMENT

QUESTION 4

4.1   Value must be unique/ no duplicates. ✓   (1)

4.2   Range check/ Validation rule ✓   (1)

4.3   4.3.1   ClientSAID and ClientSAID_Ref ✓   (1)

         4.3.2   One-to-Many relationship ✓
                    On the One side: tblClients table
                    On the Many side: tblOrders table✓

                    Concepts
                    • Correct type of relationship
                    • Correct table indicated for one and for many side   (2)

4.4   Adding the ClientAge field will result in data redundancy as the age can be
         derived from the ID field. ✓   (1)

4.5   Desktop DBMS ✓
         Desktop DBMS will be sufficient as the business is small and operates from a
         single building. ✓

         OR

         Server DBMS
         Server DBMS will be more scalable/better accessibility.

         Learner suggest desktop/server DBMS with suitable motivation for two marks   (2)

4.6   4.6.1   Run-time error ✓   (1)

         4.6.2   Referential integrity/ relational tables ✓   (1)

4.7   Keeping identical copies✓ of a database   (1)

4.8   *Any TWO*: ✓✓
         • Use different passwords for different accounts.
         • Make passwords long in length.
         • Avoid using words that can be found in a dictionary.
         • Avoid using personal information about yourself or your family.
         • Change passwords on a regular basis.
         • Include a combination of special characters, uppercase and lowercase
           characters and numbers.
         • Avoid keyboard patterns   (2)

4.9   The capturing of private/ unrelated information✓ without the users'
knowledge. ✓   (2)

4.10   The practice of examining large datasets in existing databases (and data
warehouses) in order to generate new information/finding patterns/trends ✓in
data.   (1)

4.11   Keeps track of / records ✓ changes ✓ in the database

         OR

         Who made the changes.
         When the changes were made.   (2)

4.12   When a record is open for editing / inserting, the record is flagged as 'in use'✓
No other entity can make changes to that specific record until 'in use' flag/lock
is removed. ✓   (2)

TOTAL SECTION D: **20**

SECTION E: SOLUTION DEVELOPMENT

QUESTION 5

5.1
    5.1.1 String/ Text ✓ (1)

    5.1.2 Integer/ Number ✓ (1)

5.2
    5.2.1 *Any ONE:* ✓
        NOT((10 > 5.0) OR (False))
        NOT(True OR False)

        The final answer
        False ✓ (2)

    5.2.2 *Any ONE:* ✓
        (False = NOT True) AND (5.0 = 10 / 2)
        True AND True

        The final answer
        True ✓ (2)

5.3
    5.3.1 2 ✓ (1)

    5.3.2 5 times ✓ (1)

    5.3.3 4 ✓✓ (the contents of the loop has not been executed) (2)

5.4   Minimum: 5 ✓
      Maximum: 12 ✓ (2)

5.5   Ceil() ✓ (1)

5.6   *Any ONE:* ✓
       • Every single element needs to be compared / checked.
       • In large datasets this can take a long time to perform. (1)

5.7

```
1  Display 'Please enter a string of digits'
2  sInput ← input
3  Loop i from 1 to length(sInput) ✓
4      sLine ← '' ✓
5      n ← sInput[i] ✓
6      Loop j from 1 to n ✓
7          sLine ← sLine + '*' ✓
8      Display sLine ✓
```

Concepts
Correct outer loop (1)
    Initialize output variable before inner loop (1)
    Inner loop (1) from 1 to character at outer loop position (1)
        Add '*' to output variable (1) in inner loop
    Display output variable (1)

(6)

TOTAL SECTION E: 20

SECTION F: INTEGRATED SCENARIO

QUESTION 6

6.1   6.1.1   A *mobile office* refers to a situation where you can carry/have with your portable tools essential for your business and the communication equipment ✓ that makes you reachable✓.

Concepts
- A description of mobility
- Office equipment   (2)

6.1.2   *Any ONE*: ✓
- Can work from anywhere
- A freelance worker avoids the expense of paying rent
- Resources and equipment are always on hand
- Working hours not dependant on access to office   (1)

6.2

6.2.1   Cloud / Internet / Cyberspace/ Web✓   (1)

6.2.2   *Any TWO* correct examples of cloud storage services: ✓✓
- Google Drive
- DropBox
- OneDrive
- MediaFire
- MEGA
- iCloud
- NextCloud
- SkyDrive   (2)

6.2.3   *Any TWO*: ✓✓
- Image files
- Video files
- Sound files
- Text
- Media file   (2)

6.2.4   *Any ONE*: ✓
- Media platform for professionals with the same interest
- Create a work/ experience profile/ job search
- Marketing platform for professionals   (1)

6.2.5   *Any TWO:* ✓✓
- Do not provide personal/their details such as cell phone numbers or ID/ Do not provide passwords/Social engineering
- Enable privacy settings
- Disable share location settings/whereabouts
- Block unwanted users
- Disable cookies
- Limit third party applications
- Do not befriend strangers   (2)

6.3   The process of getting two or more sets of data across multiple devices/ locations ✓ updated with the latest/same versions ✓of the data.   (2)

6.4

6.4.1   *Any TWO:* ✓✓
- Easy to upgrade outdated hardware.
- Easy to repair/replace broken/defective hardware.
- Allows for customisation   (2)

6.4.2   *Any ONE:* ✓
- Webcam/ camera/ smartphone
- Speakers/ ear phone/ head phone
- Microphone
- Wireless headset   (1)

6.5

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

Concepts
- More than one computer
- Perform a specific/one task   (2)

6.5.2   By downloading and installing software on their computers✓, which will automatically start working on the project when their computers are idle✓.

Any TWO concepts✓✓
- Give permission for the use of your computer
- Provide/ share processing power
- Computer is idle/ not in use
- Install the appropriate software on their computers   (2)

6.6

6.6.1   Artificial Intelligence✓   (1)

6.6.2   Since the developer makes use of a knowledge base ✓ there are a fixed number/possible outcomes/answers ✓ for each question or criterion.
                                                                               (2)

6.7

    6.7.1(a)   *Any TWO:* ✓✓
- Anti-malware products/ Antivirus
- Operating system/ System software
- Firewall
- Firmware/ BIOS
- Web browser
- Product specific updates   (2)

    6.7.1(b)   Anti-malware/ Antivirus products: to allow for newer forms of malware to be detected ✓
All other software: malware exploits bugs or weaknesses in the security of software. ✓   (2)

    6.7.2   Malware that locks or encrypts data/devices ✓ until a ransom is paid✓.

        Concepts
- Malware makes data/devices unavailable / unreadable.
- Ransom/Money must be paid to make data accessible again or decrypt data.   (2)

6.8

    6.8.1   An attack that makes a web site unavailable ✓by using thousands of computers/botnet to request data from the site at the same time/ overloading the system. ✓   (2)

    6.8.2   Script kiddie ✓   (1)

6.9

    6.9.1   *Any ONE:* ✓
Device that uses a battery to supply power.
Device used in the event of a power failure/problem to supply power.   (1)

    6.9.2   *Any ONE:* ✓
- Helps to protect the computer/storage devices against power surges and spikes.
- Keeps the computer on to allow the user to save data/ shut down the computer.   (1)

    6.9.3   Lossy ✓   (1)

6.10

    6.10.1   Digital rights management ✓ (1)

    6.10.2   *Any ONE*: ✓
- BitTorrent/ Torrent/ UTorrent
- FTP (1)

6.11

    6.11.1   *Any TWO*: ✓✓
- Turn off radio wave transferring and receiving devices such as Bluetooth, GPS, Wi-Fi, etc.
- Turn on battery-saving mode.
- Disable sync functionalities.
- Limit background activity.
- Close open apps not in use (multitasking).
- Turn down screen brightness.
- Avoid playing media or video games on smartphones, as it drains battery rapidly.
- Carry a battery pack. (2)

    6.11.2   *Any ONE*: ✓
- An Internet connection is required.
- Both users need to utilise the same software in order to communicate using VoIP.
- Credits need to be purchased in order to call telephones that are not on the Internet.
- VoIP can transfer a lot of data, especially for video calls, which can make it expensive or use up data caps quickly.
- Call quality is easily negatively affected due to slow or poor quality Internet connections. (1)

TOTAL SECTION F: 40
GRAND TOTAL: 150