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QUESTION 1**15 MARKS**

- 1.1 **Over clocking** Overclocking is the practice of making computer components run at speeds faster ✓ than designed by changing the components frequencies. ✓ (2)
- 1.2 **File Compression** - Compression is the process of applying an algorithm ✓ to a file to reduce its size. ✓ (2)
- 1.3 **Acceptable User Policy** Document ✓ outlining the expected behaviour of employees. ✓ (2)
- 1.4 **Ergonomics** The design of devices ✓ in relation to the users body. ✓ (2)
- 1.5 **Digital Divide** The gap between people who have access to technology ✓ and to those who do not. ✓ (2)
- 1.6 **Fat Client** ✓ (1)
- 1.7 **Dark web** ✓ (1)
- 1.8 **Virtual Memory.** ✓ (1)
- 1.9 **Registers/cache** ✓ (1)
- 1.10 **Object** ✓ (1)

QUESTION 2**MATCHING COLUMNS****10 MARKS**

2.1	D
2.2	H
2.3	A
2.4	L
2.5	C
2.6	J
2.7	I
2.8	F
2.9	E
2.10	B

QUESTION 3**31 MARKS**

- 3.1.1 Volatile memory ✓ that store all loaded programs and data. ✓ (2)
- 3.1.2 These devices are not modular. /Integrated. ✓ (1)
- 3.2.1 Hyperthreaded – More than one set of registers ✓ on the CPU. ✓ (2)
- 3.2.2 Device A – 16 ✓
Device B: 12 ✓ (2)
- 3.3 Store next few instructions and data ✓ to speed up slower RAM. ✓ (2)
- 3.3.1 Disk cache – use RAM to speed up slower HDD. ✓
Browser cache – use RAM/HDD to speed up slower Internet. ✓ (2)
- 3.3.2 Web site is stored on network server proxy cache ✓ and then downloads accessed and stored in local browser cache. ✓ (2)

- 3.4.1 Keyboard compatible means that the tablet can be connected to a full size physical keyboard. ✓ (1)
- 3.4.2 It would be easier to type each person's data ✓ in as it would not take up the screen with the onscreen keyboard. ✓ (2)
- 3.5.1 File synchronization (file sync) is a method of keeping files that are stored in several different physical locations up to date. ✓
- File backup is a duplicate copy of your data that can be used to recover your files or even an entire hard drive after a data loss event. ✓ (2)
- 3.5.2 Copy files to a cloud server ✓ using WiFi. ✓
- Device A could back up files to a SD card
- Device A back up files to a device it is synchronised with
- Device A could back up files by sending the files via Bluetooth an external device.
- ANY CARRECT ANSWER. (2)
- 3.6.1 SD cards use flash memory. ✓ (1)
- 3.6.2 Reason 1: Flash memory is an electronic non-volatile. ✓
- Reason 2: Flash memory (SD cards) can be erased and reprogrammed. ✓ (2)
- 3.6.3 Example 1: Patient's information ✓
- Example 2: Vaccine stocks ✓ (2)
- ANY TWO reasonable answers.
- 3.7.1 Closer to human language – easy to learn ✓
- High level of abstraction programmer do not need to manage workings of computer ✓
 - Instructions can be written in fewer lines of code
 - Access to pre-written libraries
- ANY TWO (2)
- 3.7.2 Java Delphi C++ C etc. ✓ (1)
- 3.7.3 Small display area ✓
- Limited CPU/ RAM – program must respond quickly ✓
- Must be supported on multiple platforms
- Limited storage space
- ANY TWO (2)
- 3.7.4 Android iOS ✓ (1)

QUESTION 4

38 MARKS

- 4.1.1 Router A router is a networking device that forwards data packets ✓ between computer networks. ✓ (2)
- 4.1.2 Gateway A gateway connects networks ✓ converts information, data or other communications from one protocol ✓ or format to another to allow data, information transferal or communication between networks of different protocols. (2)
- 4.1.3 Wireless Mesh Network(WMN) In a WMN network connection is spread out among dozens or even hundreds of wireless mesh **nodes** ✓ that "talk" to each other to share the network connection across a large area. ✓ (2)

WMN – easy to add extra nodes ✓

WMN – self correcting if one node is not working

ANY TWO

(2)

4.2.1 Senders IP which is 11.12.13.14 ✓

4.2.2 Recievers IP which is 123.43.45.6 ✓

4.2.3 Packet Number ✓

4.2.4 Error Correction ✓

(4)

4.3.1 Frame has the packet as the pay load ✓ and add the MAC addresses. ✓

(2)

4.3.2 ARP ✓

(1)

4.4.1 The process of encoding information ✓ in such a way that only the person (or computer) with the **key** can decode it ✓

(2)

4.4.2 <https://www.gov.za/covid-19/vaccine/evds> ✓

(1)

4.4.3 DNS ✓

(1)

4.5.1a Both need SW, ✓ the technician will use Internet to log into client sw and control computer. ✓

(2)

4.5.1b Operating system updates; ✓ install drivers for a piece of hardware, ✓ software install, ✓ add/remove a peripheral device, configure anything, clear browser cache ... (Any THREE)

(3)

4.5.2a The purpose of a VPN is to allow remote users ✓ (usually employees) to access resources ✓ on a network which they would normally have access to if they were in the office

(2)

4.5.2b No ✓ – the VPN add a device onto a network, ✓ not takes control over another computer.

(2)

4.6.1 A UPS is a device consisting of a battery pack and some electronic circuitry which monitors the incoming power supply and switches to supplying the device connected to it with power from the battery, for a limited period of time ✓

(1)

4.6.2 They might not be able to carry on vaccinating ✓, they won't know who is registered ✓, if they have enough vaccines. ✓ If entire database is destroyed they will have no patient records, no vaccination records ANY THREE

(3)

4.6.3a Router ✓ – need to connect to the Internet to get patent records. ✓

Nurse tablet ✓ – need to record patient info. ✓

Nurse printer ✓ – need to give patient their vaccination card ✓

Accept server and switch with a good reason

(6)

QUESTION 5

13 MARKS

5.1.1 SQL injection is a web security vulnerability that allows an attacker to interfere with the queries that an application makes to its database. It generally allows an attacker to view data that they are not normally able to retrieve. ✓

(1)

5.1.2 Most instances of SQL injection can be prevented by using parameterized queries (also known as prepared statements) instead of string concatenation within the query. ✓

(1)

5.2.1 Blockchain is a distributed database. ✓ Data is added once all computers agree – consensus. ✓

(2)

- 5.2.2 Each blocks contain information about the block previous to it, they form a chain, with each additional block reinforcing the ones before it. ✓ Therefore, blockchains are resistant to modification of their data because once recorded, the data in any given block cannot be altered retroactively without altering all subsequent blocks. Consensus. ✓ (2)
- 5.3 Big data will help the health department gain more insight into the people who have been vaccinated and how their health has been protected. ✓ It will also help them plan where to put up vaccination centres and how many people to expect in each centre. ✓ (2)
- 5.4 Ransomware attack is when the files on a server are encrypted and a ransom has to be paid in order for the owner of the files to be able to access them again (decrypted) ✓ (1)
- 5.4.1 It could mean that people who have registered to use the app will have their personal health information made public. ✓✓ ANY CORRECT ANSWER (2)
- 5.5 ANY TWO REASONABLE PRECAUTIONS. (2)
- Make sure that you have antivirus and malware protection on your devices. ✓
 - Protect your passwords. ✓
 - Back up your data regularly
 - Don't click on links or download attachments from people or companies you're not familiar with (2)

QUESTION 6**6 MARKS**

- 6.1.1 Non relational – unstructured ✓ and flexible (easy to adapt to changing data) ✓ (2)
- 6.1.2 Authenticate users - who can access the database. ✓
- Ensure referential integrity ✓
- Data validation ANY CORRECT TWO (2)
- 6.2.1 Use a COUNT(*) ✓ (1)
- 6.2.2 use WHERE Completed = True ✓ (1)

QUESTION 7**29 MARKS**

- 7.1 (10)

Class Name : Vaccination ✓	
- idNumber : string	✓✓ (1 for private, 1 for correct field types and names)
- type : integer	
- vaccineNumber : integer	
- dateOfVaccine : date	
- <u>totalPfizer</u> : integer	✓ (1 for underlined)
- <u>totalJJ</u> : integer	
+ PFIZER = 0 : integer	✓✓ caps, value assigned (-1 for each error)
+ JJ = 1 : integer	
+ Constructor (idNumberIn : string, typeIn : integer, vaccineNumberIn : integer) ✓	
(name and parameters)	
+ getVaccineNumber () : integer	✓
+ setVaccineNumber (vaccineNumberIn: integer)	✓
+ toString () : string	✓

- 7.2 Encapsulation achieved by having all variables and methods for the vaccination class in one unit. ✓ Private fields can only be accessed by public methods ✓ (2)

Data Validation Check	Description
Length check✓	There must be 13 digits✓
Type check✓	All characters must be digits✓
Check digit✓	The last character is a check digit – check using algorithm✓

7.4.1 File structure is flexible can hold a single object or an array of objects✓

JSON files are language independent if passing data between different applications✓

ANY CORRECT TWO

(2)

7.4.2

(2)

```
{
  "idnumber": "5809230036088",
  "type" : 1,
  "vaccineNumber" : 2978, ✓
  "dateOfVaccine" : "14/07/2021" ✓
}
```

7.5.1

A	H	W	P	Workings			F(A,H,W,P)
				A+H	W	P'	
0	0	0	0	0+0	0	1	0
0	0	0	1	0+0	0	0	0
0	0	1	0	0+0	1	1	5.1 0✓
0	0	1	1	0+0	1	0	0
0	1	0	0	0+1	0	1	0
0	1	0	1	0+1	0	0	0
0	1	1	0	0+1	1	5.2 1✓	1
0	1	1	1	0+1	1	0	0
1	0	0	0	1+0	0	1	0
1	0	0	1	1+0	0	0	0
1	0	1	0	1+0	1	1	5.3 1✓
1	0	1	1	1+0	1	5.4 0✓	0
1	1	0	0	1+1	0	1	0
1	1	0	1	5.5 1+1✓	0	0	0
1	1	1	0	1+1	1	1	1□
1	1	1	1	1+1	1	0	0

(5)

7.5.2 $F(A,H,W,P) = A'HW P' + AH'WP' + AHWP'$ ✓

(3)

QUESTION 8

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9 MARKS

8.1

Line	size	max	maxName	loop	loop < size?	vaccineTotal[loop] > max?	output
1	3						
2		5549					
3			Pfizer1				
4				1	T		
5						T	
6		6877					
4				2	T		
5						F	
4				3	F		
9							6877, Pfizer1

1 Mark per line

(7)

8.2

Save the vaccineName[loop] to maxName between lines 6 and 7 ✓✓

(2)

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