PECANWOOD
COLLEGE
Prepared for Life

INFORMATION TECHNOLOGY THEORY EXAMINAITION.
GRADE 10

NAME: _Memo._   GRADE: __01__

DATE: 8 NOV 2022   MARKS: 130
EXAMINER: MR SC EILERTSEN   TIME: 2 HOURS
MODERATOR: MR C SEEWALD

INSTRUCTIONS:

1. This examination is made up of 15 pages. Please ensure that your paper is complete.
2. You will be supplied with a resource pack that has addendum 1, addendum 2, addendum 3 and addendum 4. Make sure that you have them all.
3. It is in your own interests to write clearly with a dark-coloured pen.
4. You may use a non-programmable calculator.
5. Additional paper is provided at the end of this examination. If you use it, please label your answer clearly using the same numbering as the exam paper.

Question One   **Data representation**

1.1) Fill in the following table which shows the same number represented in decimal, binary and hexadecimal. You can use the additional paper at the end of the exam paper for your workings (which will not be marked – only the answers here in the table below)

Question	Base 10	Base 2	Base 16
1.1	36	00100100	24
1.2	173	10101101	AD
1.3	2603	No answer is required here.	A2B

(6)

Question Two: Terminology - Overview of computers, hardware, software, networking

Within the computer environment we use many different terms.

Link the word on the left-hand column with an associated partner in the right-hand column. Use the grid below to answer writting first the letter of the alphabet followed by an associate number eg 2.11) K - 11

Question		Left hand column		Right hand column
2.1	A	Laptop	1	Application software
2.2	B	Spyware	2	Operating system
2.3	C	Solid State hard drive (SSD)	3	Malware
2.4	D	Microphone	4	Primary memory - volatile
2.5	E	Ms Word	5	Secondary memory – non volatile
2.6	F	RAM	6	Computing device
2.7	G	Unshielded twisted pair (UTP)	7	Input device
2.8	H	Ms Windows 10 Home	8	Output device
2.9	I	Wi-Fi	9	Bounded media
2.10	J	Printer	10	Unbounded media

2.1 __A - 6__   2.2 __B - 3__   2.3 __C - 5__   2.4 __D - 7__   2.5 __E - 1__

2.6 __F - 4__   2.7 __G - 9__   2.8 __H - 2__   2.9 __I - 10__   2.10 __J - 8__

(10)

Question Three   Theory - Multiple choice

Answer by placing a circle around the letter of your choice.

3.1) Loadshedding. Which of the following are not affected by loadshedding

A) The user

B) Application program

C) Primary memory

D) Secondary memory

E) The CPU

3.2) A computer with a word size of 4 bits offers 16 possible combinations – this affects the computer's ability to process and store data. A computer with a word size of 8 bits offers _____ possible combinations

A) 8

B) 16

C) 32

(D) 64

E) 128

F) 256

3.3) Which of the following is **not** one of the functions of an operating system . . .

A) Manage the computer's resources like primary memory and secondary memory

B) Provide an interface (command line or GUI) for the user to interact with the device

(C) Communicate directly with peripheral devices

D) Load and run programs allocating them the resources they need to run correctly

3.4) When people talk about IP addresses, we use decimal numbers to make discussion easy but in reality an IP address is made up of 4 separate binary numbers (a total of 32 bits – IPv4). If the IP address of my computer is 17.12.64.9 what would its full 32-bit IP address be?

(A) 0001 0001   0000 1100   0100 0000   0000 1001

B) 0000 1001   0100 0000   0000 1100   0001 0001

C) 0000 1111   0000 1111   0100 0010   0100 1101

D) 0001 1001   0011 1001   0100 1100   0010 1001

E) None of the above

3.5) I have the following URL . . .

https://www.java-teacher.com/gr-10-july-exams-memos/march-practical -exam

The format of a URL is as follows

A   The path, the resource, the domain, the protocol

B   The protocol, the domain, the resource, the path

C   The domain name, the protocol, the path, the resource

D   The protocol, the resource, the domain, the path

(E) The protocol, the domain name, the path, the resource

3   CSW

3.6) Here the Venn Diagram is meant to represent line 1. Which Venn diagram (one, two, three or four) best represents the following java code snippet (the shaded area represents the result set). A = integer. B = integer.
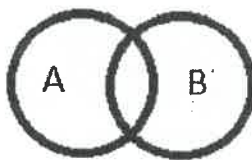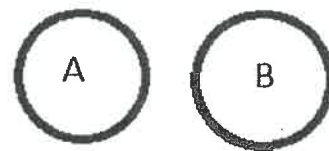
not clear enuf
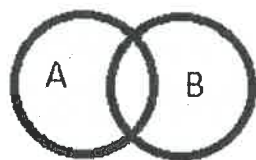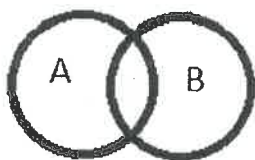
ONE   TWO   THREE   FOUR

```
1 while (A > 5 and B < 20)
2 {
3     Code block;
4 }
```
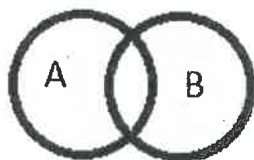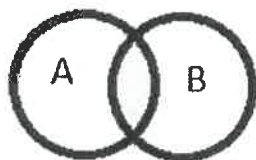
A) One

B) Two

C) Three

D) Four

3.7) Which Venn diagram (one, two, three or four) best represents the following internet search when looking for a branded perfume (the shaded area represents the result set). A = Gorgio Armani. B = Ralph Lauren
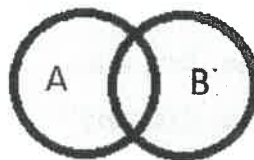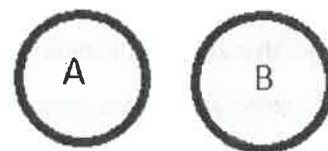
not clear enuf

ONE   TWO   THREE   FOUR

Google   "gorgio armani" or "ralph lauren"

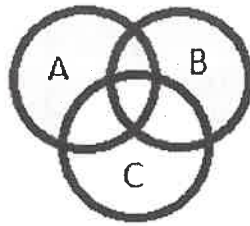A) One

B) Two

C) Three

D) Four

Both are fine

CSW

3.8) Scenario is a high school. The grade 10 cricket players are away on tour. The principal wants a list of all the other grade 10 learners on campus and is interested in the sports they play. Which Venn Diagram (one, two, three or four) best represents the following SQL statement (the shaded area represents the result set) where A = Grade 10 learners, B = Grade 10 learners who play a sport and C = Grade 10 Learners who play cricket.
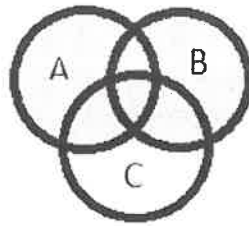
→ not clear enough
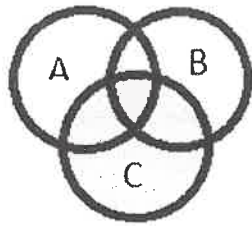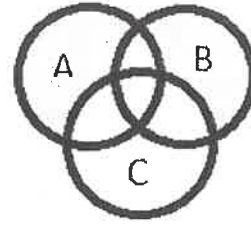
One   Two   Three   Four

```
1 SELECT A, B
2 FROM tblLearners
3 WHERE result_set <> cricket;  // is not equal to
```

A) One

(B) Two

C) Three

D) Four

3.9) Parts that make up a typical CPU in a computer . . .

A) Arithmetic Logic Unit, Control Unit, registers, RAM

(B) Arithmetic Logic Unit, Control Unit, registers

C)) Arithmetic Logic Unit, Control Unit, registers, RAM, ROM, the motherboard

D) Arithmetic Logic Unit, Control Unit, registers, RAM, ROM

E) Arithmetic Logic Unit, Control Unit

F) Arithmetic Logic Unit

3.10) Which input device would offer the most **reliable** information, and in addition offer the **greatest amount** of information that can be used in conjunction with a database in a client-server environment . . .

A) A mouse

B) A bar code scanner

C) A keyboard

(D) A QR code scanner

(10)

5

CSW

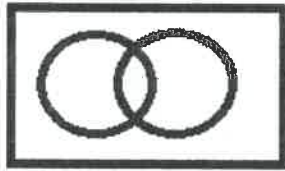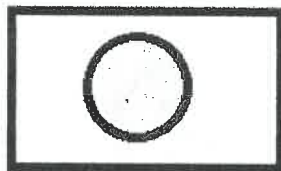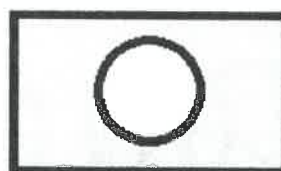**Section Four.**   **Boolean Logic. Logical Operators. NOT, AND, OR**

4.1)
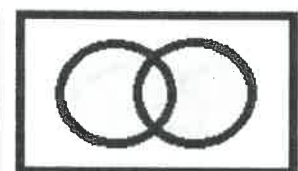
ONE   TWO   THREE   FOUR

4.1.1) Which of the diagrams above could be used to represent A ? _____Two_____ (1)

4.1.1) Which of the diagrams above could be used to represent NOT A ?__Three__ (1)

4.1.1) Which of the diagrams above could be used to represent A AND B ? __One__ (1)

4.1.1) Which of the diagrams above could be used to represent A OR B ? __Four__ (1)

4.2)
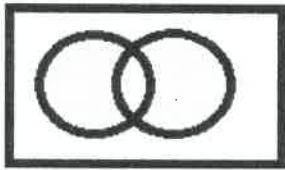
FIVE   SIX

shading not deep enough

4.2.1) Using the letters A, B and the relational operators, how would you describe diagram five above?

__A AND B AND NOT (A AND B)__ (2)

4.2.2) Using the letters A, B and the relational operators, how would you describe diagram six above?

__NOT A AND NOT B__ (2)

4.3) Evaluate the following Boolean expressions and **show all workings – NO credit will be given for a final answer only**. The examples below (A and B) show different workings, but the final answer is the same.

Reminder to follow the **order of operations** for Boolean ie brackets, NOT, AND, OR

EXAMPLE A:	EXAMPLE B:
Q 4.3.8) 7 is an integer AND (a rectangle has 3 sides OR a cat is a mammal) TRUE AND (FALSE OR TRUE) TRUE AND (TRUE) TRUE	Q 4.3.9) 7 is an integer AND a rectangle has 3 sides OR a cat is a mammal TRUE AND FALSE OR TRUE FALSE OR TRUE TRUE

4.3.1) NOT(9 = 9 AND 5 > 25) (3)

NOT (TRUE AND FALSE)
NOT (FALSE)
TRUE

4.3.2) Ice is cold AND 4 is even OR 7 is positive AND NOT water is liquid (4)

TRUE AND TRUE OR TRUE AND NOT TRUE
TRUE OR TRUE AND FALSE
TRUE OR FALSE
TRUE

4.3.3) 1 OR 0 (1)

TRUE OR FALSE
TRUE

4.3.4) NOT TRUE AND NOT FALSE OR NOT NOT NOT TRUE (3)

FALSE AND TRUE OR FALSE
FALSE OR FALSE
FALSE

4.3.5) Using the truth table below prove or disprove the following Boolean expression (A + B + C)' = (ABC)'

A	B	C	(A+B+C)'			(ABC)'		
0	0	0	(0+0+0)'	(0)'	1	(000)'	(0)'	1
0	0	1	(0+0+1)'	(1)'	0	(001)'	(0)'	1
0	1	0	(0+1+0)'	(1)'	0	(010)'	(0)'	1
0	1	1	(0+1+1)'	(1)'	0	(011)'	(0)'	1
1	0	0	(1+0+0)'	(1)'	0	(100)'	(0)'	1
1	0	1	(1+0+1)'	(1)'	0	(101)'	(0)'	1
1	1	0	(1+1+0)'	(1)'	0	(110)'	(0)'	1
1	1	1	(1+1+1)'	(1)'	0	(111)'	(1)'	0

(9)

Boolean expression is (TRUE / FALSE) _____ FALSE _____ (1)

F(A,B,C) = ___ A'B'C' + ABC _____ (when is the expression true) (2)

[31]

C&W

Section Five   **Networking and scenario question**

	Globe Holder is a medium sized business that manufactures commercial and industrial light fittings for businesses, schools, and factories.

Globe Holder have a factory in one building and next to it an administration office. In a third building they have a warehouse for stock that is not yet sold or has not yet been delivered to the client. They also have two mobile sales representatives that travel from one commercial client to another giving expert advice on lighting solutions for every building. They also have truck with a driver that collects and delivers stock.

Stock control is a critical part of their business as the factory can only make one style of light fitting at a time. Therefore, knowing what is in the warehouse and what still needs to be manufactured is a critical part of forward planning, customer service and satisfaction.

The company has a **database** where they record the stock on hand as well as the details of each stock item. One of the tables in the database looks like this. **Another table** is used to record the number of each style, colour, size etc o. every light fitting in the warehouse, as well as the number that may currently be in the factory currently under construction.

tblFitting

Field	Datatype	Description of the field
SerialNumber	integer	The primary key
name	text	The name of the light fitting
Description	text	Description of the light fitting
Style	text	The style of the light fitting. Choose one off a list of 10
Colour1	text	The main colour
Colour2	text	A secondary colour
Length	integer	In centimetres
Breadth	integer	In centimetres
Height	integer	In centimetres
Weight	integer	In grams
MaterialOne	text	The main material used in its manufacture
MaterialTwo	text	A secondary material used in its manufacture
Attachment	text	How/where it attaches. Choose one off a list of 10

5.1) In general terms explain **what is a computer network**. A number of devices (nodes) connected by a communication channel that facilitates sharing of resources. (2)

5.2) In general terms what **hardware** would they need to create a local area network? devices (nodes), switch or hub, network interface card, media (bounded or unbounded)

_____ (2)

5.3) Their network will be a **client-server** network. What is meant by this term

Server shares its resources with clients plus one other relevant point

_____ (3)

5.4) How will this client server network assist the company with its their stock control issues? What advantages will it offer them?

Database with the stock can be made available to the clients in real time. Stock levels are instantly visible to everybody all the time. Low stock levels can be seen and ordered from factory before they run out _____ (5)

5.5) It is decided that they will have 5 different servers. Explain the role that each server below will fulfil.

Server	How will it assist the company – what role will this server fulfil?
5.5.1) A file server	Sharing of valuable documents. Collaboration on working documents
5.5.2) A print server	Sharing of printers and scanning devices
5.5.3) A web server	Hosting of a web site that show cases their product range and the availability of stock.

1 CS2

5.5.4) An email server	Provides an email service and email storage for everybody in the company
5.5.5) A proxy server	All web content, coming in or going out is screened. Intruders are kept out. Cached content can be provided for websites already visited. Database is not directly accessible from the internet

(10)

5.6) The two mobile sales representatives have smart phones that allow them to login to the company network and database. This facilitates "synchronising of data between devices." Explain what is meant by this statement and how it will help them offer good service to their clients

All devices are updated with new data in real time. Current stock levels are known by everybody all the time

(3)

[25]

Computers, smartphones, the internet, and the lockdowns of Covid-19 have dramatically changed our world, our society, education, the way we do business and the workplace. To answer this question, we are going to call this the world of "ICT" (Information and Communication Technologies)

Below is a list of some of these changes.

Online shopping (eCommerce) - Cyberbullying – Spyware - Scams and online fraud - Being able to make information available to a lot of people quickly and easily - Fast access to data - Social media - Less travelling - Unauthorised access to private data - Toxic waste is generated by the dumping of old computer equipment - Injuries and health problems due to poor working conditions (poor ergonomics) - Convenient access to services (banking, pension, vehicle licensing, passports etc) - Exposure to inappropriate/illegal material and resources - Being able to work from home - Communication software like email, WhatsApp, Twitter, and Instagram – Wikipedia – The Dark Web - Sitting all day and not getting exercise - Sharing of resources regardless of where you live or work - Potential isolation because of addicted to various social media platforms and computer games - Malware - Being able to collaboratively work together on the same project - Being able to store data, information, and resources easily and conveniently - Fake news that uses digitally manipulated images for propaganda purposes - Identity theft - Software develops quickly and so your hardware becomes obsolete.

Choose a number of these topics and answer the following question (do **not** try to use too many of them – some are totally irrelevant to this scenario while other are 100% relevant, so choose wisely)

> Mr and Mrs Tsebe are about to celebrate their 50th wedding anniversary and have requested that their children pool their resources and buy them one significant and meaningful gift (**not** "big-expensive" but significant).
>
> Their four adult children, all live in four different countries – two of them have adopted a more western lifestyle while the other two follow a more traditional African lifestyle in keeping with their family roots and origin.
>
> The children need to communicate, discuss, agree, and purchase a suitable gift that must be ready, in South Africa on the day of the celebration.

6.1) Give four ways that ICT can assist (facilitate) the progress leading up to the arrival of the right gift.

Real time discussion and sharing of views, pictures, websites by the four children.

Video conferencing

eCommerce + delivery to the correct address

Online banking + payments

(8)

Scheduling of meetings despite different time zones

6.6) Give three inherent dangers that the four siblings could experience by using ICT to achieve their gifting goal.

The danger of ICT is, not being face-to-face, people can be more easily offended if they have very different views and values.

Could be scammed or hacked

Products viewed online might look very different when delivered.

Typed text (WhatsApp, Twitter, Chat etc) is permanent thus the offense cannot be erased

(6)

[14]

CSW

Make a close study of addendum One

This is a SQL statement that creates a 3-table database that is very similar to the own you created in class. Each table has fields with their own datatype. Each table has a primary key. One table has its own fields but also has two foreign keys – these foreign keys allow a relationship to exist between the data in one table and the data in another table – the foreign keys have been indicated on the page.

You are already very comfortable with the structure on the INSERT statement that allows a database to be filled with data (records). Note that in this version of SQL (SQLite) the primary key is included in the INSERT statement (unlike Ms Access)

Once you have a solid understanding of the database, its structure, its fields and the records in each table answer the following questions

7.1) What is Dave Delta's mobile phone number? _076 123 7412_ ∟ (1)

7.2) What score does Dave Delta have? _23_ ∟ (1)

7.3) Is Dave Delta a boarder? _Yes_ ⌐ (1)

7.4) Give the address of Charles Charlie _Montana Zambezi_ ⌐ (2)

7.5) Name the other learner who lives at the same address as Charles Charlie _Dave Delta_ ⌐ (1)

7.6) List the four learners who live at "The Close" _Andrew, Gary, Harry, Jally_ (2)

7.7) Is Harry Hotel a rugby player? Yes or no _Yes_ ⌐ (1)

7.8) Give the name ⸻ of the rugby coach. _Mamelio Mehandi_ ⌐ (2)

7.9) Eric Echo plays cricket. Will his mother be able to book him a dentist appointment at 10am on 9 November 2022? Explain yes or no response in terms of his sporting commitments.

Yes. He only has a match the next day ⌐ (2)

7.10) Give the most popular sport amongst the boarders _Rugby + Tennis_ ⌐ (3)

8) Flowcharts, pseudocode, and Java source code

Make a close study of addendum Two (pseudocode), addendum Three (flowchart) and addendum Four (Java source code) – they are intended to give the **same output**, but only two agree, while one of them gives a different output.

8.1) Which one gives a different result? Addendum two, three or four? _Three_ ⌐ (3)

8.2) Write out the line below that causes the result to be different.

three = (one + two) * three ∧ (3)

8.3) Correct the line below so that it agrees with the other two.

three = one + two * three ✓ (2)

8.4) Now that all three of them give the same result, complete a **trace table** that shows all the variables with their relevant variables as the program moves from the first line to last processing line – (the output part of the algorithm does not have to be included in the trace table) (see the relevant comment in the code). A grid on its own page has been provided for you to use. (10)

(84)

CSC

8.4) The Trace table grid.

You do not have to use all the columns or all the rows. Suggestion: Use a pencil so that you can edit your work if necessary)

	name1	name2	name3	one	two	three	two>0
12				1	2	3	
13	Andrew	Betty	Charlie				
15				2			
17					2		
18					4		
20							True
23						14	
24	null						
25		Charlie					
26			nullCharlie14				
	✓	✓	✓		✓	✓	✓	✓✓

[34]

GRAND TOTAL: 130

Q1 6

Q2 10

Q3 10

Q4 31

Q5 25

Q6 14

Q7 34