



**PECANWOOD
COLLEGE**

Prepared for Life

**INFORMATION TECHNOLOGY THEORY JULY 2019
GRADE 10**

NAME: Memo

GRADE: _____

DATE: 29 JULY 2019

MARKS: 100

MODERATOR: MR N NAINAR

TIME: 120 MINUTES

EXAMINER: MR SC EILERTSEN

INSTRUCTIONS:

1. This exam is made up of 9 pages.
2. There is an addendum of two pages – “Addendum One”
3. You may use a non-programmable calculator where relevant.
4. Note that there are no trick questions in this exam e.g. there are no deliberately missing semi colons, full stops or irrelevant spelling errors in the provided code examples – simple answer the question as stated.

Section One

Java – Short Questions.

1) Fill in the number from column one, next to its description in column three.

Num	Term	Fill in	Description
1	JRE	2	We need to download this in order to code programs in Java. It automatically includes the JRE and a copy of the IDE called “NetBeans”.
2	JDK	4	Although not essential, we can download one of these platforms to make our Java coding easier. We could however equally use any text editor.
3	JVM	1	We need this installed on our computer in order to run a Java program. It can be installed by default when we buy a new computer.
4	IDE	3	This computer is not real – it exists only in the RAM of our computer. It runs our Java programs.

(4)

1.2) Fill in the number from column one, next to its description in column three.

Num	Term	Fill in	Description
1	Java SE	4	We use this version of Java to code apps that can run on mobile devices.
2	Java Embedded	2	We use this version of Java to code programs that are going to run on small micro-computers that are found in cars, robots, tracking devices, security systems etc.
3	Java EE	3	We use this version of Java to code programs that run on computers that are part of large networks, where security is important and access rights and permissions are necessary.
4	Java ME	1	We use this version of Java to code programs that run on desktop computers, laptop computers and small local networks

(4)

1.3) Cross out the words that do not apply in the questions below.

1.3.1) Java is a ~~single~~ platform language / multi-platform language.

1.3.2) Java is a ~~low-level~~ programming language / high-level programming language.

1.3.3) Java is ~~case-insensitive~~ / case-sensitive.

1.3.4) Java uses a ~~compiler~~ / an interpreter, to run the code you have created.

1.3.5) Java can run on Apple Mac OS, Ms Windows and on Linux. True / ~~False~~.

1.3.6) In Java, programs are called classes. True / ~~False~~.

1.3.7) Classes in Java start with a ~~lower case~~ letter / an upper case letter. (Recommended practice)

1.3.8) Packages in Java start with a lower case letter / an ~~upper case~~ letter. (Recommended practice)

1.3.9) Methods in Java start with a lower case letter / an ~~upper case~~ letter. (Recommended practice)

1.3.10) When we type a Java program, we enter a semi-colon when we get to the end of a line, so that we can start on a fresh line. ~~True~~ / False (10)

1.4) I am writing an application in the IDE called jGRASP to control the water temperatures in three different aquarium tanks; each tank has its own special needs. I create a folder for my project called "aquariumcontrol".

Each tank has a sensor that feeds the water temperature data, back to my Raspberry Pi computer.

- First I create a class that has the main method.
- Then I create a class to accept the sensor data from tank one.
- Then I create a class to accept the sensor data from tank two.
- Then I create a class to accept the sensor data from tank three.
- Then I create one special class, that processes the raw data from all three tanks into useful information. This class then emails me the information in report form; it does this once every hour.

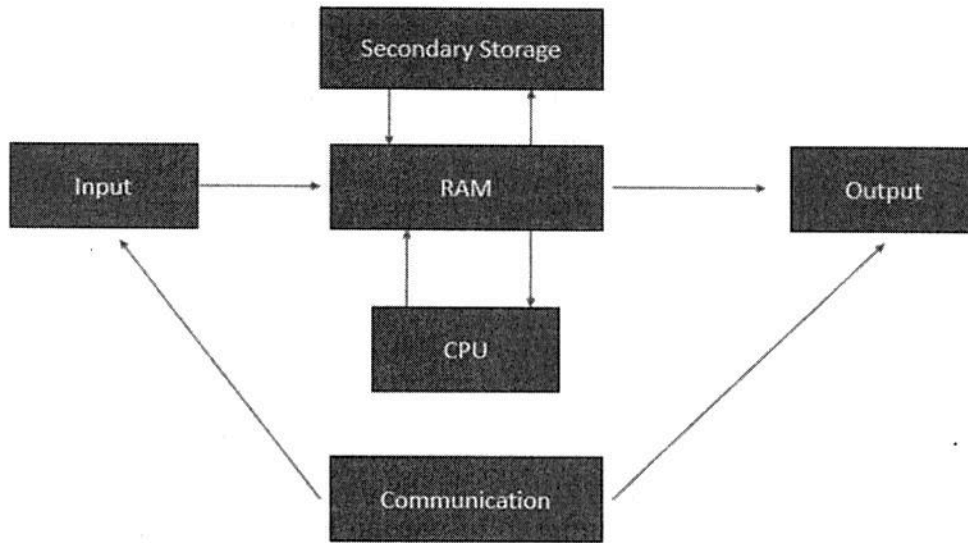
1.4.1) Then I compile all my classes. How many files will show up in my aquarium folder? 10 (2)

1.4.2) What will their extensions be? .java .class (2)

Section Two

Basic Concepts of Computing

2.1) Study the diagram below that shows the six major components of a modern computing system and then answer the questions that follow.



2.1.1) Name the two components that are at the essential heart of any computing system i.e. personal computers, car tracking devices, security systems, navigation systems etc.

CPU & RAM (2)

2.1.2) Using the components from the diagram, discuss the terms "volatile" and "non-volatile".

RAM is volatile - when you turn off the power the data is lost
Secondary Storage is non-volatile. Data remains even when the power is off (4)

2.1.3) List ten different input devices mouse, track ball, stylus, touchscreen, camera, scanner, bar code scanner, biometrics scanner, modem, keyboard, keypad sensor (5)

2.1.4) List 4 different output devices printer, monitor, touch screen, projector, modem (2)

2.1.5) You download* the JDK from the Oracle website. This is Action One *

You install** it. This is Action Two **

You start coding in Java***. This is Action Three ***

You compile and run**** your code. This is Action Four ****

Now answer the questions that follow (still based on the diagram on page 3)

2.1.5.1) Action One*

Which of the six components are involved at this point? Communication (1)

2.1.5.2) Action Two **

Which of the six components is involved at this point? Secondary Storage (1)

2.1.5.3) Action Three ***

Which of the six components is involved at this point? Input (1)

2.1.5.4) Action Four ****

Which of the six components is involved at this point? RAM or
Output or
CPU (1)

Section Three

Hardware

3.1)

Num	Term	Fill in	Description
1	ROM	3	Highly compact, non-volatile, secondary storage for cameras, mobile phones MP3 players etc. Disadvantage is that they are not that durable.
2	HDD	6	Contains the individual settings for a computer. During boot-up the Basic Input Output System reads these settings and configures the computer accordingly e.g. where can the OS system be found?
3	Memory card	8	The first computer program to load on boot-up stored on a memory chip often plugged onto the motherboard.
4	DVD	1	A non-volatile memory chip stores the Basic Input Output System which allows the computer to boot up'.
5	Ethernet port	9	The processor that decodes and executes instructions coming from RAM.
6	CMOS	10	A secondary storage device that is very fast because it has no moving parts. The disadvantage is that it is relatively expensive per Mb.
7	USB port	2	A secondary storage device which offers a lot of storage at a budget price. The disadvantage is that they are relatively slow.
8	BIOS	11	This technology used in computer monitors replaced the old Cathode Ray Tube monitors. Smaller, lighter and more energy efficient than CRT technology.
9	CPU	5	Allows a computer to connect to a local area network via a cable.
10	SSD	12	Fast volatile memory, these days, situated inside the CPU itself, thereby making access to it faster as data does not have to move via the data bus.
11	LCD	4	A secondary optical storage device. Light, affordable, portable and fairly durable.
12	Cache Memory	7	A port that you can plug many different devices into e.g. external hard drives, cameras, printers and memory sticks.

(12)

4.1) Name seven functions or tasks that the operating system takes care of. Include in your answer hardware support, software and general day-to-day computer management tasks (house-keeping)

- manages all hardware
- manages all hardware accessories and facilitates Plug-and-Play and the downloading and installation of device drivers
- Manages the installation of software onto a secondary storage device. Always manages the un-install process.
- Manages the allocation of RAM to programs currently loaded and running.
- Provides a GUI for users.
- Provides utilities for file management - Creation + deletion of folders. Creation, editing, moving and deletion of files.
- Provides utilities for hardware management eg defrag, disk clean up (10)
- Provides, and manages the file allocation table (FAT)
- Provides utilities for users to customise their interface eg wall paper, mouse speed
- Provides utilities for people with special needs eg colour, shape, size for ease of use.
- Provides some degree of security and authentication by providing user profiles
- The OS is not anti-virus or anti-malware

4.2) Internet Security. Protecting your computer against all forms of malware is an important part of computer ownership. Malware comes in many different forms – not all of them are “viruses”. Match the malware to its description; do this by writing the number from column one next to the description in column three.

Num	Type of Malware	Fill in	Description
1	Virus	5	Software that is installed on a computer to intercept the user's interaction, without the user's consent e.g. it can record your keystrokes and thus learn your banking password.
2	Trojans	6	Unwanted and annoying software that automatically displays or downloads to a computer. They access cookies (small files containing personal data) stored on the computer to customise the displayed adverts to the user's preference.
3	Worms	3	Self-replicating programs that are spread throughout a network. It causes damage by using up the available bandwidth, or by mining the information on the computer and rewriting the data.
4	Logic bombs	2	Malicious programs which attach themselves to an executable file, and then run together with the original file. Such files are not self-replicating and are therefore not classified as a virus. A Trojan can give an outside user access to a secure server via a “backdoor”, without having to provide a username or password.
5	Spyware	1	A self-replicating program illegally placed onto a computer that causes damage to the system. They can spread from one computer to another. Some can even send themselves to all the email addresses found in the computer's email program address book.
6	Adware	4	Self-replicating malicious programs that will execute at a specific date or when a specific condition is met.

(6)

4.3) Software Licensing

Chose from the following types of software licenses to answer the questions that follow.

Propriety, Shareware, Freeware, Creative Commons, Free and Open Source

4.3.1) Software that is not copyrighted. It can be copied, shared and the source code, which is provided, can be modified. An example is Linux.

Free + Open Source (1)

4.3.2) Software that is copyrighted. You can share it and load it multiple times. It is free but you may not sell it. The source code is not provided.

Freeware (1)

4.3.3) Software is copyrighted. You can share it and use it for a limited time period so that you can try it out. Once the trial period is over, you have to pay for it.

Shareware (1)

4.3.4) Software is copyrighted. You may not share it or load it multiple times. You need to pay for it before you may use it.

Propriety (1)

Section Five

Data Representation

5.1) Write the following decimal number 143 in . . .

Binary 1000 1111 (2)

Hexadecimal 8F (2)

5.2) Write the following binary number 1100 1011 in . . .

Decimal 203 (2)

Hexadecimal CB (2)

3) Write the following hexadecimal number 9A4 in . . .

Decimal 2468 (2)

Binary 0000 1001 1010 0100 (2)

5.4) Decimal is counting in 10's. Binary is counting in 2's.

Counting in 8's is called "Octal" – exactly the same principals apply as decimal and binary.

What would the decimal number 99 be in octal? 143 (2)

Section Six

Scenario

Check out Addendum One which outlines a 10-inch Android tablet that a school would like its learners to use.

Study the technical features that the tablet has to offer. Answer the questions that following with your own ideas, views, experiences and opinions. In each case fully explain / justify your answer explaining your position from an Information Technology point of view.

6.1) Would this tablet be useful for the school to stay connected to the student body? Explain your answer.

* Yes, via 3G voice and data. School can receive and send text and voice messages.

Can connect to the DB Communicator (2)

Can send and receive emails, Good battery life

* Assumption: School offers students free WiFi

6.2) Would this tablet be useful for learners going on an excursion to the Military Museum in Johannesburg? Explain.

Yes, take photos of objects and printed text. Can record information given by the museum staff for play back later. Can use free WiFi (2) if available - can contact the school if needed

6.3) Would this tablet be suitable for learners in Grade 10, 11 and 12 wanting to learn Java? Explain.

No. Touch screen keyboards are not great for coding even although the tablet has the capabilities to install, load and run Java. (2)

6.4) Would this tablet be suitable for learners needing to do research on the Internet? Explain.

Yes, via school's free WiFi and search engines like Google. Harvested information can be stored for retrieval later - both images & text (2)

6.5) Would a tablet like this be suitable for learners living in the boarding house at the school? Explain.

Yes. Easy to lock away. Light and portable. Disadvantage - reasonably fragile. Can still be stolen. With free WiFi students can communicate with parents via WhatsApp Email. (2) 3G voice + data. Also good battery life.

6.6) How would learners having this tablet, affect those in leadership e.g. the headmaster, the teaching staff, the head of houses, the school and hostel prefects, the sports coaches etc

Improve communication. Minutes of meetings, guidelines & codes of conduct can be easily shared. Everybody can access the same lists, schedules, programs and calendars. (2)

6.7) Would a tablet like this help or hinder group work e.g. six students all working on the same Life Orientation project.

Help. Students can share work + resources via 3G or Bluetooth. Facilitates collaboration. (3)

TOTAL: 100 Marks

NB

Other relevant answers are totally acceptable, with explanation.

Addendum One

Features

- 10 inch screen (1280 X 800)
- 4 core CPU @ 1.8 GHz
- 16 GB NANDFlash
- Gorilla Screen
- Bluetooth
- 3G and WiFi
- GPS
- 9 hours of operation

Description

This is a 10 inch Android tablet. With a 4 core CPU @ 1.8 GHz per core, it can do more job than an ordinary laptop.

With a big screen you can sit back and relax when watching high definition video. Plus with big screen this tablet crosses the boundary of a viewing device into a device that can create and publish. It's Wi-Fi and 3G connectivity makes it easy to stay connected World Wide Web at all times.

CPU	RockChip MTK8389 Quad Core 1.8GHz CPU
Memory	1GB DDR3 16GB NAND Flash Memory Built-in Micro SD Card Reader (for extended memory up to 64GB)
Display	10.1 Inch Gorilla Glass HD (1280 x 800) Capacitive Multi-Touch IPS TFT Panel (16 x 10 Format)
Camera	Built-in 2.0 M Pixel Front Camera and 5.0M Pixel Rear Camera
LAN	Embedded 802.11 b/g/n Wireless LAN
Bluetooth	Yes
GPS	Yes
3G	Yes, Voice and Data
Speaker & Microphone	Built-in Sound, Speakers and Microphone
I / O ports	1 x Micro USB2.0, 1 x Mini HDMI
Battery	Li-Polymer Battery (7000mAh, 9 hours operating) & Charger
Adapter and cables	Micro USB to USB Cable (Male), Micro USB to USB Adaptor (Female) Mini HDMI to HDMI Cable

P1

Earphone	Yes
Carry Case	Folder-type Carry Case
OS	Android 4.2
Dimension	Dimension: 260 x 177 x 10,5mm Weight: 700g
Warranty	Warranty: 1 Year Carry-In