Grade 10 Computer and Information Science
Unit 1 – Major Test

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Victim: _____

KU	APP	TIPS	COM
/15	/10	/10	/10

1. Match each term in the left column with the *best* definition in the right column. **(10 KU)**

_**U**_ Rootkit

_**aa**_ Hacker

_**j**_ Virus

_**h**_ Operating System

_**K**_ Phishing

_**bb**_ Spyware

_**S**_ Hard Drive

_**V**_ ~~Logical Network~~ Drive

_**m**_ EULA

_**q**_ Worm

_**X**_ RAM

_**b**_ Malware

_**n**_ Anti-virus

_**y**_ Sniffer

_**t**_ Trojan

_**d**_ USB Flash Drive

_**e**_ Defragment

_**o**_ CPU

_**f**_ System Tray

_**a**_ Router

> Sandeep, Avinash and Demarr are my heroes!

a. A device that connects two networks, typically a LAN to a WAN.

b. Any program that has a malicious purpose.

c. What you are more likely to catch if you don't use the item mentioned in "w."

d. A small, portable storage device with storage capacities up to 16 GB or more.

e. A process that involves reorganizing the information stored on a disk drive. Doing this often helps to speed up a computer system.

f. A small area on the taskbar that contains small icons used mostly to allow users to have quick access to OS functions.

g. A device used to connect to a remote computer network via telephone voice lines. It converts digital information to analog form and vice versa.

h. The master control program that provides an interface for a user to communicate with the computer, manages hardware, manages disk file systems and supports applications.

i. Software developers issue these to correct bugs in their software.

j. An annoying or malicious program that is embedded within a legitimate file.

k. The luring of an Internet user to reveal personal details.

l. Any software flaw (i.e. programming mistake).

m. A legal agreement between a computer user and a software developer.

n. A program that helps to prevent viruses from being installed on a computer system. Such programs can often be used to delete viruses that already have infected a system.

o. A very fast device in a computer that executes instructions in programs.

p. A high voltage "flash" of electricity used to stop cheaters from copying. ZAP!

q. A computer program that is capable of propagating over a network.

r. A program that can solve any computer problem that is caused by malicious software.

s. A somewhat slow storage device with a large storage capacity. It stores your installed software and all your saved documents.

t. A program that appears desirable but actually contains harmful code.

u. A set of software tools frequently used by a third party after gaining access to a computer system. These tools are intended to conceal running processes, files or system data.

v. A portion of the storage space of a physical drive that is assigned a drive letter and treated as if it were an independent unit.

w. A brand name of a "preventive measure" product that can be purchased from pharmacies, convenience stores and vending machines.

x. A fast storage device that stores open programs and documents. Without this type of storage, computer performance would be extremely slow.

y. A program or device that can intercept and log traffic passing over a digital network or part of a network.

z. Equipment or programs designed to communicate information from one system of computing devices or programs to another.

aa. Someone who gains unauthorized access to computer systems. Originally, this term referred to a highly skilled programmer.

bb. Computer programs that obtain personal information without the user's consent.

cc. A program that controls incoming and outgoing network traffic. Such a program determines which programs are allowed to have LAN and Internet access.

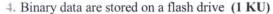Questions 2 to 6 are multiple choice. Circle the *best answer* in each case.

2. A DVD-RW drive is **(1 KU)**
   (a) only a storage device.
   (b) both a storage device and an input device.
   (c) a storage, input and output device.
   (d) a storage, input, output and processing device.
   (e) a glorified cup holder.

3. Binary data are stored on a hard drive **(1 KU)**
   (a) in very thin permanent ink (the 0s and 1s can be seen using a high power microscope).
   (b) optically, with the data arranged in one continuous spiral.
   (c) optically, with the data arranged in concentric tracks, each of which is subdivided into sectors.
   (d) magnetically, with the data arranged in one continuous spiral.
   (e) magnetically, with the data arranged in concentric tracks, each of which is subdivided into sectors.

4. Binary data are stored on a flash drive **(1 KU)**
   (a) in very thin permanent ink (the 0s and 1s can be seen using a high power microscope).
   (b) optically, with the data arranged in one continuous spiral.
   (c) optically, with the data arranged in concentric tracks, each of which is subdivided into sectors.
   (d) magnetically, with the data arranged in one continuous spiral.
   (e) magnetically, with the data arranged in concentric tracks, each of which is subdivided into sectors.
   (f) none of the above

5. A supercomputer is **(1 KU)**
   (a) a very fast computer at the "front line" of processing capacity.
   (b) a computer so powerful that only superheroes can use them.
   (c) any computer that uses Windows Vista as the operating system.
   (d) any computer that has access to "super" video game sites and "other" sites that are considered very inappropriate.
   (e) a very large computer, that is, one that has been "super-sized" by consuming far too much spam.
   (f) an extremely fast (roughly 100000 times faster than an ordinary desktop computer) and highly specialized computer that is used primarily for scientific purposes such as climate and geologic modelling.

6. A transistor is **(1 KU)**
   (a) a small electronic device used to resist the flow of electricity.
   (b) a small electronic device used to store an electrical charge.
   (c) a small electronic device used to switch current on and off.
   (d) a small electronic device used to switch current on and off and to amplify electrical signals (i.e. make the signals "stronger").
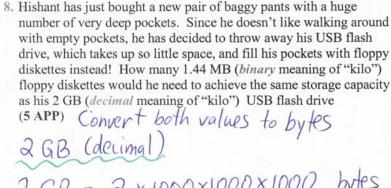
7. Complete the following statement:

   If the transistor had not been invented, cell phones, desktop computers and a host of other electronic devices would not exist because... **(3 COM)**

   Before the invention of the transistor, vacuum tubes were used to perform essentially the same function. Unfortunately, vacuum tubes are far too large to be used in small devices like those mentioned above. Even transistors themselves are too large to be used in such devices. However, the transistor, in highly minutiarized form, is the main component of an integrated circuit (IC or chip), a device without which the information revolution could not have taken place.
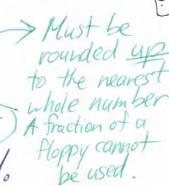
8. Hishant has just bought a new pair of baggy pants with a huge number of very deep pockets. Since he doesn't like walking around with empty pockets, he has decided to throw away his USB flash drive, which takes up so little space, and fill his pockets with floppy diskettes instead! How many 1.44 MB (*binary* meaning of "kilo") floppy diskettes would he need to achieve the same storage capacity as his 2 GB (*decimal* meaning of "kilo") USB flash drive (5 APP)

Convert both values to bytes

2 GB (decimal)

$2 GB = 2 \times 1000 \times 1000 \times 1000$ bytes
$= 2\,000\,000\,000$ bytes

1.44 MB (binary)

$1.44 MB = 1.44 \times 1024 \times 1024$ bytes
$= 1\,509\,949$ bytes

$\therefore$ #floppies $= \dfrac{2\,000\,000\,000\ bytes}{1\,509\,949\ bytes/floppy} \doteq \boxed{1324.5}$

→ Must be rounded up to the nearest whole number. A fraction of a floppy cannot be used.

Approximately 1325 floppies would be needed.

9. One day, Chris M. got a "brilliant" idea. He decided to "borrow" a huge number of mp3 audio files from two of his classmates. First, Chris M. paid Chris G. a "friendly" visit. To avoid disturbing Chris G.'s family, Chris M. decided to climb a ladder and enter Chris G.'s house through an open window. Upon entering Chris G.'s residence, Chris M. found a network jack and connected his laptop to Chris G.'s home network. Once he was finished downloading music from Chris G., Chris M. decided to do the same at Kyle's house, just to make sure that Kyle would not feel "excluded."

Altogether, Chris M. downloaded a total of 35.8 GB (*binary* meaning of "kilo") of music at a speed of 100 Mbps (*decimal* meaning of "kilo"). How long did it take him to transfer this music to his laptop? (5 APP)

35.8 GB → bytes (binary)
$35.8 GB = 35.8 \times 1024 \times 1024 \times 1024$ bytes
$\doteq 3.84399573 \times 10^{10}$ bytes

100 Mbps → bytes/s (decimal)
$100 Mbps = 100 \div 8$ **MB/s** (decimal MB)
$= 12.5 \times 1000 \times 1000$ bytes/s
$= 12\,500\,000$ bytes/s

$\therefore$ time $= \dfrac{3.84399573 \times 10^{10}\ bytes}{12\,500\,000\ bytes/s} \doteq 3075\ s = 3075 \div 60$ minutes
$= 51.25$ minutes
$= 51$ minutes, 15 seconds

It took Chris M. at least 51 minutes, 15 seconds to transfer all the audio files to his computer.

10. Whose side would you take in this very heated "debate?" Support your answer with relevant facts concerning overall computer speed and CPU speed. (The guy is Junaid and the girl is Kim.) **(5 TIPS)**

My computer is *much faster* than your computer. It has a 3.06 GHz processor and your computer only has a 2.6 GHz CPU. Ha, ha, ha, ha, ha, ha, ha, ha, ha, ha! You LOSE!!!!!!!!

You are nothing but a *colossal idiot*! It's not possible to compare processors by clock speed alone! You need to know more details before you can reach a conclusion.

Kim is correct to suggest that clock speed alone cannot be used to determine the speed at which a computer functions. In fact, the clock speed is simply a measure of the number of "on-off" cycles generated per second by a computer's clock circuitry. This produces a square wave that is used for timing purposes, that is, to keep the various devices within the CPU in sync with one another. In reality, the speed of a CPU depends on how many instructions can be executed per clock cycle. One way of measuring this is to determine the number of floating point operations that can be performed per second. This is commonly known as the FLOPS rating of a CPU and is a much more reliable measure of speed than clock speed.

11. Under the assumptions listed below, the storage capacity of a particular hard drive is *equivalent to about 10 km of* bookshelf space. Calculate the approximate storage capacity of the hard drive. **(5 TIPS)**

- The average number of words in each book is 100000 words.
- The average word length is 8 characters. → 2 bytes of memory per character
- The Unicode system is used to store the data in plain text form (no formatting information is stored).
- The average thickness of each book is 2 cm.

\# characters in an average book = $100000 \times 8 = 800000$

amount of storage needed per book = 800000×2 bytes = 1600000 bytes

$10 \text{ km} = 10000 \text{ m}, \qquad 2 \text{ cm} = 0.02 \text{ m}$

$\therefore \# \text{ books} = \dfrac{10000 \text{ cm}}{0.02 \text{ cm/book}} = 500000$

$\therefore \text{ total storage} = (500000 \text{ books})(1600000 \text{ bytes/book})$

$= (500000 \times 1600000) \div 1024 \div 1024 \div 1024 \text{ GB}$

$\doteq 745 \text{ GB} \quad \text{(binary)}$

The hard drive has a storage capacity of about 745 GB (binary) (decimal → about 800 GB)