

Q2 - 23

COPPERBELT UNIVERSITY

Q3

SCHOOL OF INFORMATION AND COMMUNICATIONS TECHNOLOGY  
INTRODUCTION TO COMPUTING (CS.110)

TEST I (MARCH, 2022)

INSTRUCTIONS

Answer all questions in the space provided – No back page will be checked. All marks add up to 100.  
Marks are indicated beside each question. Time allowed is 60 minutes.

PERSONAL DETAILS

GROUP: E NAME: Kapanga Jonas SID: 22111573

QUESTION ONE

1. A type of memory that can hold data for long periods of time, even when there is no power to the computer, is called \_\_\_\_\_.  
a. RAM      b. main memory      c. secondary storage      d. CPU storage
2. A set of 128 numeric codes that represent the English letters, various punctuation marks, and other characters is \_\_\_\_\_.  
a. binary numbering      b. ASCII      c. Unicode ~~L~~      d. ENIAC
3. Which storage type is used in the modern digital cameras, mobile phones, Mp3 players etc?  
a. Pendrive      b. Flash memory card      c. Optical drive ~~d. Floppy drive~~
4. What is a firewire used for?  
a. To connect the computer to a network ~~b. For connecting the hard disk drives and network connectors~~      c. For video cameras and external hard drives      d. To connect mouse and keyboard into PC
5. The smallest section of a hard disk is called:  
a. A track      b. A cluster      c. A platter      d. A sector
6. Computer has a built-in system clock that emits millions of regularly spaced electric pulses per \_\_\_\_\_.  
a. Microsecond      b. Millisecond      c. Minute      d. Second
7. Magnetic tape is not practical for applications where data must be quickly recalled because tape is \_\_\_\_\_.  
a. A sequential-access medium      b. A random-access medium  
c. An expensive storage medium      d. A read-only medium
8. During the execution of a program which gets initialized first?  
a. MDR      b. MAR      c. PC      d. IR
9. The best mode of connection between devices which need to send or receive large amounts of data over a short distance is \_\_\_\_\_.  
a. BUS      b. Isochronous port      c. Serial port      d. Parallel port

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10. What type of non-volatile memory would most likely store firmware like a computer's BIOS?  
 a. EEPROM      b. Hard Disk      c. Tape Drive      d. Flash Drive
11. Which of the following has the largest storage capacity?  
 a. A 900 KB folder    b. A 600 MB CD    c. A 1 TB hard drive    d. A 32 GB flash drive
12. Which of the following units of measure do you use to measure the CPU speed?  
 a. GHz      b. Number of cores      c. Mbps      d. TB
13. Which of the following is independent of the address bus?  
 a. Cache memory    b. Onboard memory    c. Secondary memory    d. Main memory
14. Size of the \_\_\_\_\_ memory mainly depends on the size of the address bus.  
 a. Cache      b. Secondary      c. Main      d. Virtual
15. Which of the following requires power to be on in order to maintain the data it stores?  
 a. ROM      b. RAM      c. Hard disk      d. Flash drive

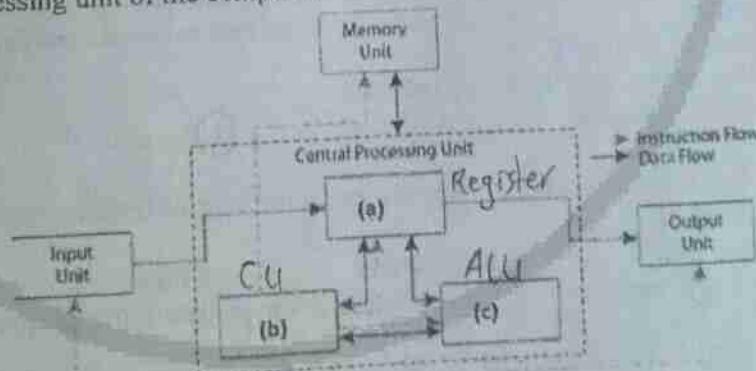
[10 Marks]

Write the following in full:

16. POST: Power On Self Test
17. SATA: Serial Advanced Technology Architecture
18. PCB: Printed Circuit Board
19. ATX: Advanced Technology Extended
20. CD-RW: Compact Disk Rewritable

## QUESTION TWO

- a) Carefully examine the following diagram that is supposed to show the different components that make up the central processing unit of the computer.



From the three (3) components a, b, and c shown above, state the component that performs the following functions:

- Holds the CPU's instruction set, which is a list of all operations that CPU can perform.
- Temporarily store data to be sent to memory

b.

a.

- iii. Perform logical operations.  
 iv. Keep track of the program instruction to execute next  
 v. Coordinate input and output activities of a computer.

C ✓

a  
b

(1 mark each)

[5 Marks]

b) Match the following:

A

- a) Very Large scale Integration  
 b) Vacuum Tube Technology  
 c) Stored Program  
 d) Superconductor Technology  
 e) Semiconductor Technology

B

- I) Second Generation  
 II) Fifth Generation  
 III) Fourth Generation  
 IV) First Generation  
 V) Third Generation

c) State the steps that make up the instruction cycle.

- (i) Fetch (iv) Store  
 (ii) Decode  
 (iii) Execute

[4 Marks]

d) What are the two key factors that characterize the memory?

- Access time ; the time interval between read/write request and

availability of data

- Storage Capacity ; Amount of information that a computer can store

[2 Marks]

[9 Marks]

Fill in the blanks:

- e) In a Binary System, computer number and characters are represented as a series of 0's and 1's.  
 f) A system bus or expansion bus comprises of three kinds of buses Data Bus, Control Bus and Address Bus.  
 g) The Data of data bus affects the speed of computer.  
 h) The clock frequency is measured in Kilohertz (KHz).  
 i) Random Access Memory and Read Only Memory are the two main types of primary memory.  
 j) The size of the register is also the Word size.

### QUESTION THREE

a) Output devices provide output to the user, which is generated after processing the input data.

[2 Marks]

i. What are the two (2) classes into which output devices fall?

- Visual / soft copy

- Hard copy

ii. For each one of the two (2) classes you have listed in (i), give 2 examples.

[4 Marks]

Visual / soft copy

Hard copy

- Monitor

- Printer

- Speakers

- Plotter

Q 3

- b) In addition to input devices and output devices, some devices function as both input and output devices. The I/O devices provide the input to computer as well as get output from computer. List three (3) examples of I/O devices. [3 Marks]

- Floppy Disk - Touch screen  
 - Flash drive

(3)

- c) Different kinds of printers are available for different applications. Printers are classified into two categories- impact and non-impact printers. Give two examples of each. [4 Marks]

Impact Printers	Non-Impact Printers
Dot Matrix	Ink-jet printer
Daisy Wheel	Laser printer

(4)

- d) Complete each of the statements below using the options listed below. [6 marks]

- OMR
- MICR
- OCR

- i. MICR recognizes characters that are written in magnetic ink.
- ii. OCR requires clear text and errors are common.
- iii. OCR converts scanned text to a word processed file.
- iv. MICR can read numbers quickly with few errors.
- v. OMR recognises the position of marks on paper.
- vi. OMR can complete the fast processing of multiple choice answers.

(6)

Fill in the blanks:

[6 Marks]

- e) Light pen is an example of a picking device.
- f) mouse is an example of a pointing device.
- g) The time taken to move the read/write head to the desired track is called the seek time.
- h) Size of the main memory mainly depends on the size of the address bus.
- i) The surface of the disk is divided into concentric circles known as Sector.
- j) A kilobyte is the smallest unit that can be read or written on a disk.

(17)

#### QUESTION FOUR

- a) Identify the range of valid numbers for the following number systems
- Decimal ..... 0 to 9
  - Octal ..... 0 to 7
  - Binary ..... 0 & 1
  - Hexadecimal ..... 0 to 15

[1 Mark]  
[1 Mark]  
[1 Mark]  
[1 Mark]

- b) What do the following acronyms stand for?

- EBCDIC

[2 Marks]

- UTF

[2 Marks]

- Unicode Transformation Format

[2 Marks]

- ASCII

- American Standard Code for Information Interchange

- c) A computer uses 8-bit registers to store the world record times for marathons set by the world's top male athletes in binary. The two tables below show the times set by two athletes

Athlete A								Athlete B									
Hours	0	0	0	0	0	0	1	0	Hours	0	0	0	0	0	0	1	0
Minutes	0	0	0	0	1	1	1	0	Minutes	0	0	0	0	0	0	0	1
Seconds	0	0	0	1	1	1	0	0	Seconds	0	0	1	0	0	1	1	1

- i. By showing all your work clearly, convert the time for each athlete to decimal (hh:mm:ss) and State who was the fastest athlete [10 Marks]

- ii. By showing all your work clearly, Convert the difference between the time set for Athlete A and Athlete B from decimal to hexadecimal [5 Marks]

$$2:13:28$$

$$2:22:37$$

$$- \quad 0:11:49$$

$$= 11 \frac{1}{16} \text{ min} : 31 \frac{15}{16} \text{ sec}$$

$$\begin{array}{r} 16 | 0 \\ 16 | 0 \end{array}$$

$$\begin{array}{r} 2 \\ 2 \\ 2 \\ 2 \\ 2 \\ 2 \\ 2 \\ 2 \end{array}$$

$$\begin{array}{r} 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \end{array}$$

$$\begin{array}{r} 2 \\ 2 \\ 2 \\ 2 \\ 2 \\ 2 \\ 2 \\ 2 \end{array}$$

$$\begin{array}{r} 16 | 1 \\ 16 | 0 \end{array}$$

$$\begin{array}{r} 16 | 1 \\ \times 2 \\ \hline 32 (2) \\ + 16 (1) \\ \hline 48 \end{array}$$

$$\begin{array}{r} 16 | 4 \\ 16 | 3 \\ 16 | 0 \end{array}$$

## Question Four

(c, i)

### Athlete A

Hours:

0	0	0	0	0	1	0
2 <sup>7</sup>	2 <sup>6</sup>	2 <sup>5</sup>	2 <sup>4</sup>	2 <sup>3</sup>	2 <sup>2</sup>	2 <sup>1</sup>

$$0+0+0+0+0+0+2+0$$

2 hours

Minutes: 0 0 0 0 1 1 0  
~~2 2 2 2 2 2 2~~

Minutes: 0 0 0 0 1 1 0  
~~2 2 2 2 2 2 2~~

$$0+0+0+8+4+2+0$$

14 minutes

seconds:

0	0	0	1	0	0
2 <sup>7</sup>	2 <sup>6</sup>	2 <sup>5</sup>	2 <sup>4</sup>	2 <sup>3</sup>	2 <sup>2</sup>

$$0+0+0+16+8+4+0+0$$

28 seconds

$\therefore 2h: 14\text{ min } 28\text{ sec}$  was his time.

### Athlete B

Hours:

0	0	0	0	0	1	0
2 <sup>7</sup>	2 <sup>6</sup>	2 <sup>5</sup>	2 <sup>4</sup>	2 <sup>3</sup>	2 <sup>2</sup>	2 <sup>1</sup>

$$0+0+0+0+0+2+0$$

2 hours

Minutes: 0 0 0 0 0 0 1  
~~2 2 2 2 2 2 2~~

$$0+0+0+0+0+0+1$$

1 minute

seconds:

0	0	1	0	0	1	1
2 <sup>7</sup>	2 <sup>6</sup>	2 <sup>5</sup>	2 <sup>4</sup>	2 <sup>3</sup>	2 <sup>2</sup>	2 <sup>1</sup>

$$0+0+32+0+0+4+2+1$$

39 seconds

(F)

$\therefore 2h: 01\text{ min } 39\text{ sec}$  was the time

$\therefore$  Athlete B was the fastest

**INSTRUCTIONS**

Answer all questions in the space provided. All marks add up to 60. Marks are indicated beside each question. Time allowed is 50 minutes.

**PERSONAL DETAILS**

GROUP: E NAME: Kapanga C Jones SID: 28111573

**QUESTION ONE**

- a) For each of the following, write the system utility responsible for the given task. [4 Marks]
- Divide a single drive into multiple logical drives Disk partitioning.
  - Provides detailed information about the software installed on the computer and the hardware attached to it System profiling.
  - Find files that have not been used for a long time Disk cleaner (4).
  - Check the computer network and log events Network management.
- b) Translator software is used to convert a program written in high-level language and assembly language to a form that the computer can understand. What are the three different kinds of translator software? [3 Marks]
- Compiler (3)
  - Assembler
  - Interpreter
- c) Name any six ways in which different kinds of software is made available to the user. [6 Marks]
- Demoware
  - Open Source
  - Shareware (6)
  - Public domain
  - Freeware
  - Original Equipment Manufacturer (OEM) so
- d) On a computer without Internet Explorer, alternative software that can be used includes Chrome and Mozilla Firefox. [2 Marks]

**QUESTION TWO**

- a) Operating system provides (i) Command line interface or (ii) Graphical User Interface. There many types of operating systems and whose categories often overlap. The following are some of the types [1 Mark each]
- Embedded (6) : often found in devices such as a watches
  - Multiprocessor : can run on a laptop with a multicore processor
  - Multiuser : e.g the one found on a computer running the CBU Student Information System (Portal). [2 Marks each]
- b) A (i) program in execution is usually referred to as a process. It can be in a new, ready, running, waiting or (ii) terminated state. A CPU will often execute processes (iii) simultaneously. During execution a (iv) race condition will exist when multiple processes access and manipulate the same data concurrently, in which the final result depends on the order of process execution. (v) Scheduling is need to coordinate how the same data is shared. Despite this, a process may endlessly wait for a resource leading to what is called a (vi) deadlock.

Apart from process management, operating systems also help with memory management. One interesting feature under memory management is called (vii) Virtual memory, which allows the execution of large processes that are not completely in memory. [1 Mark each]

### QUESTION THREE:

- a) The data is sent from one computer to another over a transmission medium. The transmission media can be grouped into two main categories, what are these? [1 Mark each]  
i. Guided media ii. Unguided media
- b) List any three types of media used for wireless networking. [1 Mark each]  
i. Radio transmission  
ii. Satellite transmission  
iii. Microwave transmission
- c) A computer network is an interconnection of two or more computers that are able to exchange information. The different network types are distinguished from each other based on three characteristics, what are these? [1 Mark each]  
i. Transmission Technology  
ii. Network Topology  
iii. Size of area of connection
- d) There are three main topologies used in Local Area Networks, list them: [1 Mark each]  
i. Star topology  
ii. Ring Topology  
iii. Bus topology
- e) Identify each of the following networking devices: [1 Mark each]  
i. A hardware through which the computer connects to a network. Network Interface Card (NIC)  
ii. They cannot identify complete frames. Thus, in addition to the valid transmissions from one segment to another, they also propagate any electrical interference occurring on a segment to other segment. Repeater  
iii. Uses a technique that reads the MAC address of the data frame and forwards the data to the appropriate port. Switch  
iv. Can accept a packet forwarded for one protocol and convert it to a packet formatted for another protocol before forwarding it. Gateway

### QUESTION FOUR

- a) State the Internet term used to describe the following: [1 Mark each]  
i. Website is a set of related webpages connected through hyperlinks.  
ii. Web browser is a program on your computer that allows you to access websites on the internet.  
iii. Search engine is a software system that enables users to search and retrieve information from a database or the internet based on specific keywords or phrase.
- b) In the spaces provided below state the four components of a search engine [1 Mark each]  
i. Spider  
ii. Domain server  
iii. Indexing software  
iv. System Browser
- c) Expand the abbreviation of the following concepts [1 Mark each]  
i. URL: Uniform Resource Locator  
ii. ISP: Internet Service Providers  
iii. ISDN: Integrated Service Digital Network  
iv. DSL: Digital Subscriber Line
- d) State the Internet applications that do the following [1 Mark each]  
i. File transfer protocol is a protocol that enables the user to transfer files from one system to another.  
ii. Telecommunication network (Telnet) is a protocol that allows the user to log on to a remote computer.
- e) In the space provided below, state the two parts that constitute an email address. [1 Mark each]  
i. user's or subscriber's name  
ii. host's name or domain name



## THE COPPERBELT UNIVERSITY

SCHOOL OF INFORMATION AND COMMUNICATION TECHNOLOGY

2022/2023 SESSIONAL EXAMINATIONS

CS 110: INTRODUCTION TO COMPUTING

### INSTRUCTIONS

1. Time allowed is three (3) hours
2. There are six (6) questions in this paper. Answer any four questions.
3. **DO NOT** use acronyms or abbreviations in answering questions, unless you have been asked to do so in the question.
4. Show all necessary workings for Questions involving calculations.
5. All questions carry equal marks. Each Question is 25 Marks for a total of 100 Marks.

1766. x 3 = 5  
98 X 3  
18

**DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO**

13502

## QUESTION ONE

Fill in the blanks for part a) and part b):

- a) Compute means to (i) \_\_\_\_\_ of the computer. The set of instructions to perform various operations is called a (ii) \_\_\_\_ ✓ \_\_\_\_\_. The (iii) ✓ \_\_\_\_\_ of the computer is the physical parts of the machine like monitor, keyboard, disks etc. whereas the (iv) \_\_\_\_\_ is the various programs, procedures and other documentation which is used to operate the hardware efficiently. Classification of computers done on the basis of the logic used in their design as (v) \_\_\_\_\_ ✓ \_\_\_\_\_ and (vi) \_\_\_\_\_ ✓ \_\_\_\_\_ computers. [6 Marks]
- b) The computer has evolved from a large-sized simple calculating machine to a smaller but much more powerful machine. The evolution of computer to the current state is defined in terms of the generations of computer. The first generation of computers used (i) \_\_\_\_\_ for circuitry and computation time was in (ii) \_\_\_\_\_. The third generation computers used the (iii) \_\_\_\_\_ and computation time was in (iv) \_\_\_\_\_. The goal of fifth generation computing is to develop computers that are capable of learning and (v) \_\_\_\_\_. The fifth generation computers are based on Artificial Intelligence which includes areas like (vi) \_\_\_\_\_, (vii) \_\_\_\_\_, speech recognition, voice recognition and (viii) \_\_\_\_\_. [8 Marks]
- c) There are a number of factors involved that are related to the CPU and have an effect on the overall speed and performance of the computer. Other than registers and RAM, what are the other three (3)? [cache, data bus, system bus] [3 Marks]
- d) The processor or the CPU is the main component of the computer. Except motherboard support what three factors do you have to look at when selecting a processor? [3 Marks]
- e) What do you call the amount of information (in bits) that a memory can store? [1 Mark]
- f) The primary responsibility of a computer processor is to execute a sequential set of instructions that constitute a program. State four different categories in which an instruction can fall. [4 Marks]

- Transistors  
- Microprocessors  
- Integrated circuits  
- Integrator

## QUESTION TWO

- a) State the I/O port that can be used for the following: [4 Marks]
- Provide the plug and play features so that devices can be connected to the computer without having to re-boot it. \_\_\_\_\_
  - Connect a DVD drive to the computer. \_\_\_\_\_
  - Transmit data, one bit at a time. \_\_\_\_\_ bus
  - Transmit eight bits of data simultaneously. \_\_\_\_\_
- b) There are different methods to format a disk. File Allocation Table (FAT) is the commonly used logical format for disk formatting performed by Windows. State four areas are created when a disk is formatted using FAT. [4 Marks]
- c) ROM is a non-volatile primary memory. It does not lose its content when power is switched off. Look at the following examples of ROM memories. Under which ROM category does each of the following fall: [3 Marks] ✓
- Flash Disk: EEPROM
  - DVD-R: PFLASH
  - CD-RW: PFLASH
- d) Optical input devices allow computers to use light as a source of input. Scanner is an example of optical input device. Give three more examples of optical input devices. [3 Marks] ✓  
Barcode reader, Optical character recognition, Magnetic Ink character Recognition
- e) In addition to input devices and output devices, some devices function as both input and output devices. The I/O devices provide the input to computer as well as get output from computer. List three (3) examples of I/O devices. Touch screen [3 Marks]
- f) Magnetic tape is a plastic tape with magnetic coating. It is divided horizontally into (i) \_\_\_\_\_ vertically into (ii) \_\_\_\_\_. Data is recorded on tape in the form of (iii) \_\_\_\_\_. [3 Marks]
- g) The keyboard is an example of an input device. The design of a keyboard is similar to a standard typewriter. The modern keyboards are QWERTY keyboards. [1 Mark] ✓
- h) Mouse is a small hand-held device having two or three buttons on its upper side. In addition to the buttons, a mouse also has a small wheel between the buttons. A mouse is classified as (i) physical mouse or (ii) optical mouse. [2 Marks] ✓
- i) The performance of RAM is affected by two factors, state them. [2 Marks] ✓  
Storage capacity & access time

### QUESTION THREE

Show all necessary working for this section as no marks will be given if the working is not indicated

- a) A computer system encrypts passwords entered in octal by storing them in hexadecimal format.

One of the students has her encrypted password stored as '5D6B7C8D'. Produce the decrypted password. [8 Marks]

- b) Chikondi wants to send a secret message to Luyando using the ASCII code. He converts each letter of her message to its binary representation and then adds 00000001 to each representation. For example, the letter A is 01000001 in binary, so she changes it to 01000010. Calculate the hexadecimal representation of Chikondi's encoded message if he wants to say "LOVE"?

[8 Marks]

- c) John is upgrading his PC and wants to purchase the components online from an e-commerce site. John decides to purchase two 4GB RAM chips costing \$9.98 each, one motherboard costing \$34.45 and a 1TB Solid State Drive worth \$32.34. Assuming that the cost of shipping all these items is \$11.20 and the exchange rate is at K20.08 to \$1.

i. Convert the total amount John will pay in Kwacha to Binary [4.5 Marks]

ii. Convert the total amount John will pay in Kwacha to Hexadecimal [4.5 Marks]

1 3 5 3 9 6 7 6 2 1 5

$$\begin{array}{ccccccc}
 & S & D & G B & T C & 8 D & \\
 64 & \rightarrow & 100 & [1-2] & 5 & \boxed{13} & 6 \boxed{11} + \boxed{110} \\
 & 96 & - & 122 & [9-2] & & 8 \boxed{13} \\
 & & & & & & 6 \quad 18 \quad 18 \quad 18 \\
 & & & & & & 0111 \quad 0001 \\
 & & & & & & \hline
 & & & & & & 1000 \\
 & & & & & & 0001 \\
 & & & & & & 0001 \\
 & & & & & & \hline
 & & & & & & 10010
 \end{array}$$

$$\begin{array}{c}
 A = 10 \\
 B = 11 \\
 C = 12 \\
 D = 13 \\
 E = 14 \\
 F = 15 \\
 G = 16 \\
 H = 17 \\
 I = 18 \\
 J = 19 \\
 K = 20 \\
 L = 21 \\
 M = 22 \\
 N = 23 \\
 O = 24 \\
 P = 25 \\
 Q = 26 \\
 R = 27 \\
 S = 28 \\
 T = 29 \\
 U = 30 \\
 V = 31 \\
 W = 32 \\
 X = 33 \\
 Y = 34 \\
 Z = 35
 \end{array}$$

1567385325

$$\begin{array}{r}
 4 \quad | \quad 16 \quad | \quad 13 \quad | \quad 4 \quad | \quad 8 \quad | \\
 16 \quad | \quad 13 \quad | \quad 13 \quad | \quad 13 \quad | \quad 13 \\
 \hline
 110
 \end{array}$$

4D

## QUESTION FOUR

a) Suppose you are a software developer who wants to create a new application. First, you need to choose a (i) \_\_\_\_\_ that suits your needs and preferences. Secondly, you need to use a (ii) ~~transfor~~ to convert your source code into executable code that can be run by the computer. Thirdly, you need to use a (iii) \_\_\_\_\_ and a (iv) \_\_\_\_\_ to connect object files and place your executable code into memory for execution. Finally, you need to use some software for management and functionality of computer to run your application software. These include:

- (v) \_\_\_\_\_ : This is the most important and fundamental system software that manages the hardware resources
- (vi) \_\_\_\_\_ : These are small programs that act as intermediaries between the operating system and the hardware devices.
- (vii) \_\_\_\_\_ : These are programs that help to maintain and optimize the performance and security of the computer system.

There are two main types of software. (viii) \_\_\_\_\_ is the software that provides the basic functionality and management of the computer system, while application software is the software that performs specific tasks for the user.

Some examples of application software are:

- (ix) \_\_\_\_\_ : This is the software that allows the user to create and edit text documents.
- (x) \_\_\_\_\_ : This is the software that allows the user to create and edit images.
- (xi) \_\_\_\_\_ : This is the software that allows the user to perform accounting tasks, such as recording transactions, preparing financial statements, and managing budgets.
- (xii) \_\_\_\_\_ : This is the software that allows the user to organize and manipulate numerical data in rows and columns, such as calculations, charts, and graphs.
- (xiii) \_\_\_\_\_ : This is the software that allows the user to create and deliver presentations, such as slideshows, animations, and videos.
- (xiv) \_\_\_\_\_ : This is the software that allows the user to design and model complex objects and systems, such as buildings, machines, and circuits.
- (xv) ~~Browser~~ \_\_\_\_\_ : This is the software that allows the user to access and view web pages on the world wide web.

[15 Marks]

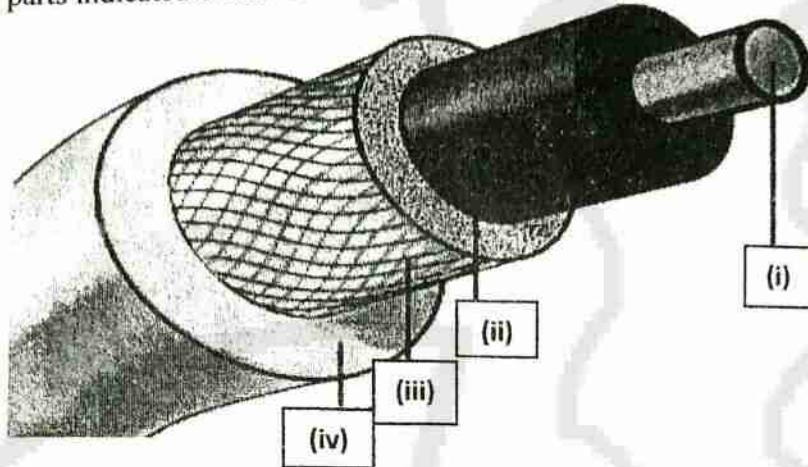
- b) The main objectives of software such as Android, Linux Mint or Windows 10 are to provide a user-friendly (i) ~~Interfa~~ to allocate the available resources efficiently, and to ensure the protection and (ii) ~~securi~~ of the system and data. One of the categories of this software include (iii) \_\_\_\_\_ which allows only one user to perform multiple tasks. This software uses a scheduler to select a (iv) \_\_\_\_\_ from the ready queue and assign it to the CPU for execution. The software also uses various scheduling algorithms to decide the order of execution of program running in memory such as (v) ~~F C t S~~ .

[10 Marks]

## QUESTION FIVE

a) Name the parts indicated on the coaxial cable

[4 Marks]



b) For an optical fiber, name the part responsible for

[3 Marks]

- i. Transmitting light: \_\_\_\_\_
- ii. Protecting the fiber from damage: \_\_\_\_\_
- iii. Preventing light from escaping: \_\_\_\_\_

c) Suggest a network device responsible for

[5 Marks]

- i. Amplifying the signal to restore to its original strength: \_\_\_\_\_
- ii. Providing an interface to connect multiple computers and devices in a network: \_\_\_\_\_
- iii. Extending LAN: \_\_\_\_\_
- iv. Dividing LAN into multiple segments: \_\_\_\_\_
- v. Connecting heterogeneous network: \_\_\_\_\_

d) The wireless technology has two main components the (i) \_\_\_\_\_ that includes the transmitter along with an area it can cover, and the (ii) \_\_\_\_\_ like mobile phones, laptops with Ethernet Card, etc.

[2 Marks]

e) Provide three characteristics that distinguish different networks from each other. [3 Marks]

f) Communicating online, whether by e-mail, chat rooms or message boards, is informal, quick and easy. However, there are certain unsaid rules that one should follow. State any four such rules.

[4 Marks]

g) For a search engine, which component is responsible for

[4 Marks]

- i. Traversing the web from link to link, identifying and reading pages: \_\_\_\_\_
- ii. Analysis pages downloaded by spiders: \_\_\_\_\_
- iii. Enabling users to query the index and usually returns the results in relevancy ranked order: \_\_\_\_\_
- iv. Storing webpages that have been downloaded: \_\_\_\_\_

## COPPERBELT UNIVERSITY

SCHOOL OF INFORMATION AND COMMUNICATIONS TECHNOLOGY  
INTRODUCTION TO COMPUTING (CS 110)

TEST 1 (MAY, 2022)

## INSTRUCTIONS

Answer all questions in the space provided – No back page will be checked. All marks add up to 100. Marks are indicated beside each question. Time allowed is 90 minutes.

## PERSONAL DETAILS

GROUP: E NAME: MUKUNGULE CLEMENT SID: 21162605

QUESTION ONE

- a) There are a number of factors involved that are related to the CPU and have an effect on the overall speed and performance of the computer. In class, we talked about 5 of them. What are they? [5 Marks]

- Random Access Memory (RAM)
- Clock tick which is measured in (GHz)
- Number of Registers
- Cache memory (B)
- Bus width

- b) What does the acronym CMOS stand for?

[2 Marks]

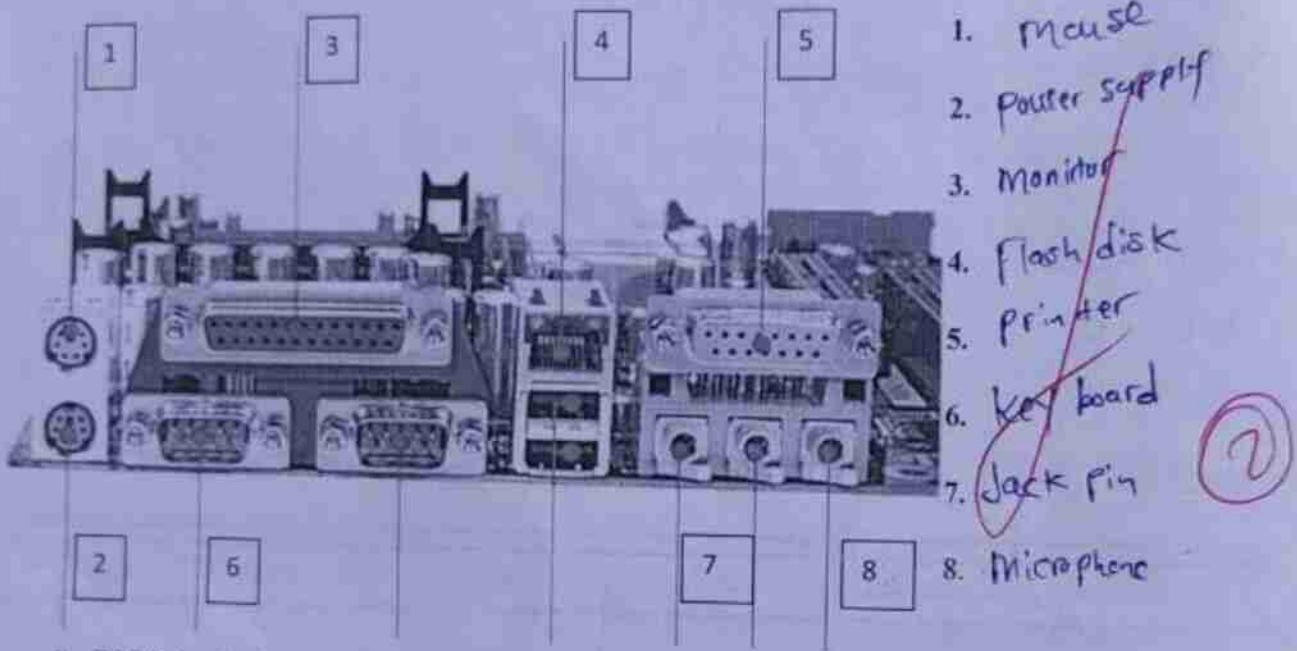
Complementary Metal Oxide Semi-Conductor

60/2

Q3 - 24  
Q4 - 11h

Q1 - 08

- c) From the diagram given below, identify a device that can be connected to each of the labeled ports. [8 Marks]



- d) BIOS is the basic program used as an interface between the operating system and the motherboard. It performs a ~~Self-operating test~~ that checks that the hardware is functioning properly and the hardware devices are present. BIOS also invokes the ~~Booting system Boot map~~ to load the operating system into memory. [4 Marks]

- e) The processor or the CPU is the main component of the computer. What four factors do you have to look at when selecting a processor? [4 Marks]

- Random Access Memory (RAM)
- Clock rate
- Registers
- Bus width
- Cache memory

before the sizes of 4Gb, 8Gb or more,  
1GHz, 2GHz or More

- f) What is the use of Firewire?

The fire is the Fire wire is used to connect video and audio inputs to the computer. [2 Marks]

(1)

20

SECTION TWO

- Q. a) A computer is defined as an electronic machine that accepts data from the user, processes the data by performing calculations and operations on it, and generates the desired output results.

i. State five (5) characteristics of a computer [5 Marks]

- Speed
- Reliability
- Storage Capacity
- Visibility
- Accuracy

✓ 5

- ii. The digital computers that are available nowadays vary in their sizes and types. The computers are broadly classified into four categories. What are the four categories?

[4 Marks]

Micro Computers

Mini Computers

Main frame Computer

Super Computers

✓ 4

- iii. If you decide to just buy a brand new laptop computer, state any four brands that you can consider.

[4 Marks]

Apple

Toshiba

HP

Dell

✓ 4

ANSWER ALL.

- b) The computer memory stores different kinds of data like input data, output data, intermediate results, etc., and the instructions. Binary digit or bit is the basic unit of memory. A bit is a single binary digit, i.e. How many bits make up
- 1MB 4096 bytes 1024 kilobytes [2 Marks]
  - 1TB 1024 \* 1024 Gigabytes [2 Marks]
  - What do you call the amount of information (in bits) that a memory can store?  
bytes [1 Mark]
- c) Imagine you want to buy a laptop computer, what reasonable specification would you look for under each one of the following components:
- Processor 2.5GHz [5 Marks]
  - RAM 8GB
  - Screen size 21"
  - Hard disk 500GB
  - Manufacturer HP
- d) In relation to memory, what is used in EPROM to erase data?  
The data is erased due to the exposure to Ultra violet rays. [2 Marks]

### QUESTION THREE

- a) What are the two categories into which input devices are classified?  
Human data entry and source data entry device. [4 Marks]
- b) Pointing devices are used for providing the input to computer by moving the device to point to a location on computer monitor. The input data is not typed; instead, the data is entered by moving the pointing device.
- Other than mouse, give two more examples of pointing devices.  
Joystick  
tracking ball [4 Marks]

Q6

a) C  
th

b) A P  
Dete

c) A mile  
1991,  
Zurich,  
average  
Give his  
ortnight.

- ii. A Mouse can be classified as being of which two types?

Physical and Digital

[4 Marks]



- c) Give two examples of non-impact printers and one for impact printer.

Non-impact

Dot matrix printer

Daisy wheels printer

Impact

drum printer

[3 Marks]



- d) An image on the monitor is created by a configuration of dots, also known as pixels. The clarity of image on the computer screen depends on which three factors? Define each one of the three factors.

[6 Marks]

Resolution - this is the amount of pixels that are in the vertical and horizontal direction. The common resolution are  $600 \times 800$

Refresh Rate - this is the time taken for the dot to refresh and appear bright

Dots - this is the number of pixels contained on area.

- e) Name the four types of optical scanners.

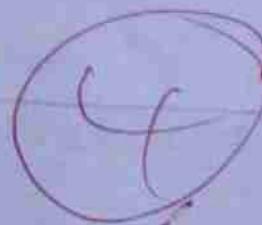
[4 Marks]

Barcode Reader

Optic Mark Recognition (OMR)

Magnetic Ink Character Recognition (MICR)

Optic Character Recognition



[4 Marks]

- a) Identify any four common encoding schemes

American Coding Schemes  
 American Standard Encoding Schemes  
 Universal Standard Coding Schemes.

Number

- b) List the largest digit for the Binary, Octal, Decimal and Hexadecimal numbering System [4 Marks]

The largest digit for a binary is One (1)

(4)

The largest digit for an octal is Seven (7)

The largest digit for a decimal is Nine (9)

The largest digit for an Hexadecimal is Fifteen (F)

- c) Passengers boarding an aircraft are allowed to carry baggage up to 15kg for free. Any extra luggage beyond 15Kg is charged at K300 per Kg. Mark, a passenger had come with 36.528Kg of luggage. Compute the binary and hexadecimal representation of the extra luggage that Mark will be charged. [8 Marks]

$$\begin{array}{r} 36.528 \\ - 15.000 \\ \hline 21.528 \end{array}$$

$$\begin{array}{r} 1 \text{ kg} & K300 \\ 21.528 & \times \\ 21.528 \times 300 & \\ = 2152800 & \times \\ = 6458400 & \\ = 6458.400 & \end{array}$$

$$21.528 = 21.1000011_2$$

$$21.528 \text{ in binary}$$

$$10101.1000011_2$$

$21.528$  in binary

$$\begin{array}{r} 21 \\ \hline 2 | 10 \\ 2 | 5 \\ 2 | 2 \\ 2 | 1 \\ 2 | 0 \\ \hline 21 = 10101_2 \end{array}$$

$$\begin{array}{r} .528 \\ \times 2 \\ \hline 1.056 \\ \times 2 \\ \hline 0.056 \\ \times 2 \\ \hline 0.102 \\ \times 2 \\ \hline 0.204 \\ \times 2 \\ \hline 0.408 \end{array}$$

$$\begin{array}{r} 21 \\ \hline 16 | 5 \\ 16 | 1 \\ \hline 21 = 15_{16} \end{array}$$

$$21 = F_{16}$$

$21.528$  in Hexadecimal

$$0.528$$

$$= F.87_{16}$$

$$- 15.87_{16}$$

$$\begin{array}{r} 16 | 3768 \\ 16 | 528 \\ \hline 3748 \\ \times 16 \\ \hline 2688 \\ \times 16 \\ \hline 448 \\ \hline 7168 \end{array}$$

$$0.87_{16}$$

- d) The following symbols are listed in order, for a known encoding scheme.

!	*	#	\$	%	&	,	(	)	*	+
---	---	---	----	---	---	---	---	---	---	---

If the hexadecimal representation of % is  $25_{16}$ .

- i) Compute the binary representation of \* and +

~~Working~~

2816	3116	8H21	8H21
R	S	8H21	0001
8H21	8H21	0010	0101
0010	0101	0011	0001
binary representation of * and +		[4 Marks]	
0010 0101	11	0011	0001
2216	2216	0011	0001
8H21	8H21	0010	0010
0010	0011	0010	0010
66		66	
Binary 15		Binary 15	
00100011		00100010	

- ii) Compute the octal representation of (

[3 Marks]

~~2816~~

8H21	8H21
0010	1000
000101 000	
421	421
421	

0 5 0

~~508~~    ~~508~~

Convert 2816 to a binary number and  
then group it in the group of three.

- iii) What is the Binary representation of FEED?

[2 Marks]

~~FEED~~

F = 15	E = 14	E = 14	P = 13
168H21	168H21	8H21	8H21
10000	01111	1110	1110

~~Working~~

F = 15	E = 14	E = 14	P = 13
8H21	8H21	8H21	8H21
1110	1110	1110	1101
1111 1110 1110 1101			

39

60

## COPPERBELT UNIVERSITY

SCHOOL OF INFORMATION AND COMMUNICATIONS TECHNOLOGY  
INTRODUCTION TO COMPUTING (CS 110)

## TEST 2 (JULY, 2022)

## INSTRUCTIONS

*Answer all questions using a tick (✓) or circling the correct answer. 11 marks add up to 60.  
Time allowed is 40 minutes.*

## PERSONAL DETAILS

GROUP: E NAME: MUKUNGULE CLEMENT SID: 2162605

21 Computer Network is

- A. Collection of hardware components and computers
- B. Interconnected by communication channels
- C. Sharing of resources and information
- D. All of the Above

22 Special purpose software are:

- A. Application software      B. System software      C. Utility software      D. None of the above

23 System program that set-up executable program in main memory ready for execution is called:

- A. Text editor      B. Compiler      C. Linker       D. Loader

4) What is the meaning of Bandwidth in Network?

- A. Transmission capacity of a communication channels
- B. Connected Computers in the Network
- C. Class of IP used in Network
- D. None of Above

5) Information systems can give an organization competitive advantage.

- A. True or (ii) False

6) Boundaries are the associations between components of a system

- (a) True       (ii) False

7) What is the use of Bridge in Network?

- A. Connect LANs      B. to separate LANs      C. to control Network Speed      D. All of the above

8) A potential violation of security and causes harm is known as a .....  
A. virus      B. breach      C. hack      D. threat

9) A destructive program that masquerades as useful program is known as .....  
A. a worm      B. a Trojan horse      C. a ransomware      D. a virus

10) Hacking always refers to a Denial of Service attack

(a) True or (b) False

11) Intercepting packets while they are being transmitted from source to destination is .....  
A. packet sniffing      B. password cracking      C. e-mail hacking      D. intrusion detection

12) The acronym CIA is used to provide security services. CIA refers to

- (a) Compromise, Insecure and Active
- (b) Confidentiality, Integrity and Availability
- (c) Confidentiality, Integrity and Authentication
- (d) Computer Security, Information Awareness and Access Control

13) Assuming that we live in a world where no one has malicious intent to harm computer systems, it would not be necessary to put in place security measures

(a) True or (b) False

14) Process is .....

- (A) A program in execution
- (B) An instance of a program running on a computer
- (C) The entity that can be assigned to and executed
- (D) All of the above

15) With ..... only one process can execute at a time; meanwhile all other process are waiting for the processor.

A. Multiprocessing

B. Uniprocessing

C. Multiprogramming

D. Uniprogramming

16) With ..... more than one process can be running simultaneously each on a different processor.

A. Multiprogramming

B. Uniprocessing

C. Multiprocessing

D. Uniprogramming

17) An information system can exist without computers

(a) True or (b) False

18) All management levels in an organisation require the same nature of information

(a) True or (b) False

19) Operating system and utility software are examples of:

A. System software B. Device drivers C. Application software D. Customized software

20) A system program that combines the separately compiled modules of a program into a form suitable for execution is:

A. Assembler B. Linking loader C. Cross compiler D. Load and go

21) Which of the following devices is used to create a LAN

A. Hub B. Bridge C. Router D. Repeater

22) Many researchers describe security as a double edged sword, the more secure a system is the more difficult it is to use that system, the less secure a system is the easier it is to use the system

(a) True or (b) False

23) Components of an Information System include

- A. Data, Information and Knowledge
- B. Environment, Boundary and Interface
- C. Input, processing, output and feedback
- D. Software, interrelationships and Communication

24) Which set shows categories of Information Systems?

- A. MIS, TPS, DSS, Mainframes
- B. Linux, Windows, Mac OS

C. Low level, Top level and First Level

D. Human Resource, Accounting, Sales

25) What is the meaning broadband?

A. Frequency B. Bandwidth C. Throughput D. fast internet access

26) Which of the following is not a Networking Device?

A. Gateways B. Linux C. Routers D. Firewalls

27) Security services are the reasons for breach of security

(a) True or (b) False

28) Which of this is not a guided media?

A. Fiber optical cable B. Coaxial cable

C. Wireless LAN

D. Copper wire

29) UTP is commonly used in

- A. DSL      B. FTP      C. HTTP      D. None of the above

30) Which one is a valid example of a specialised Information System?

- A. A fault diagnosis system for a car  
B. The accommodation application system for the University  
 C. Mobile money system  
D. A System for producing sales summaries for a supermarket

31) An Automated Teller Machine is an example of

- A. Transaction Processing System      B. E-Commerce System      C. Executive Support System  
D. Expert System

32) Which of the following is not a type of broadband internet connection?

- A. Satellite      B. DSL      C. Dial up      D. Cable

33) What is the term used for unsolicited e-mail

- A. Spam      B. Backbone      C. Usenet      D. Newsgroup

34) Sending an E-mail is similar to

- A. sending a package      B. Talking on the phone      C. Writing a letter      D. Talking on the phone

35) ARPANET stands for

- A. Advanced Research Projects Agency Network  
B. Advanced Research Projects Newak  
C. Advanced Research Projects Network  
 D. None of the above

36) A Decision Support System makes decisions for managers in the organisation

- (a) True or (b) False

37) Expert systems are used for solving General problems

- (a) True or (b) False

38) The process of connecting to the Internet account is

- A. Sign in      B. sign out      C. log in      D. log out

39) The server on the internet is also known as

- A. Hub       B. Host      C. Gateway      D. Repeater

40) A user can get files from another computer on the internet by using

- A. HTTP      B. TELNET      C. UTP       D. FTP

41) When I take a photograph of my signature which is on a piece of paper and paste that picture of a signature in a word document is

- A. a digital signature      B. an electronic signature       C. a Picture signature      D. None of these

42) A firewall can protect a network from

- A. both local and external network threats  
 B. local network threats only  
C. external network threats only  
D. password cracking threats only

43) In MODEMS

- A. Digital Signal is amplified  
 B. Several digital signals are multiplexed  
 C. A digital signal changes some characteristic of a carrier wave  
D. None of the above

44) ..... transforms the message into a format that cannot be read by hackers

- A. Decryption      B. Encryption      C. Transforming      D. Digital signature

45) ..... is used to validate the identity of the message sender to the recipient

- A. Decryption      B. Encryption       C. Digital signature      D. Transforming

46) System utility software provides basic functionality to the computer

- A. True or (b) False

47) Which of the following is independent malicious program that need not any host program?

- A. Worm      B. Trapdoor      C. Virus      D. Trojan horse

48) Which of the following is known as malicious code

- A. Illegalware      B. Badware       C. Malware      D. Maliciousware

49) A Compiler looks at a source code line-by-line while an Interpreter looks at the entire source code.

(a) True or (b) False

50) Which of the following are the states of a five state process model?

- i) Running      ii) Ready      iii) New      iv) Exit      v) Destroy

(A) i,ii,iii and v only      B. i,ii,iv and v only      C. i,ii,iii and iv only      D. All i,ii,iii,iv and v

51) The following conditions of policy must be present for a deadlock to be possible.

- i) Mutual exclusion    ii) Hold and wait    iii) No preemption    iv) Circular wait

A. i,ii and iii only      B. ii,iii and iv only      C. i,iii and iv only      D. All i,ii,iii and iv

52) As assembler is

- A. A program that automate translation of assembly in machine language  
B. A program that converts high level language in object program  
C. A program that places programs into memory  
D. A program to execute programs from source to machine language

53) Linux Operating system is

- A. Single user, single tasking      B. Single user, multitasking      C. Multi user, multitasking  
D. Multi user, single tasking

54) Microsoft internet explorer and adobe photoshop are examples of:

- A. System software      B. Device drivers      C. Application software      D. Operating System

55) Which of the following system software resides in main memory always?

- A. Text editor      B. Assembler      C. Linker      D. Loader

56) \_\_\_\_\_ is an example of an operating system that support single user process and single thread.

- A. Unix      B. MS-DOS      C. OS/2      D. Windows 2000

57) Because of virtual memory, the memory can be shared among

- A. Processes      B. Threads      C. Instructions

D. None of these

58) From waiting state, a process can only enter into

- A. Running state      B. Ready state      C. New state

D. Terminated state

59) All the processes which are ready to execute reside in

- A. I/O queue      B. Waiting queue      C. Ready queue

D. Running queue

60) Which of the following is not an Operating System?

- A. Mac OS      B. Windows Explorer      C. Red Hat

D. Solaris

*Personfile*



## THE COPPERBELT UNIVERSITY

SCHOOL OF INFORMATION AND COMMUNICATION TECHNOLOGY

2021/2022 SESSIONAL EXAMINATIONS

**CS 110: INTRODUCTION TO COMPUTING**

### INSTRUCTIONS

1. Time allowed is three (3) hours
2. There are six (6) questions in this paper. **ANSWER ALL QUESTIONS IN SECTION A AND ANY TWO (2) QUESTIONS IN SECTION B.**
3. **DO NOT** use acronyms or abbreviations in answering questions, unless you have been asked to do so in the question.
4. Show all necessary for Questions involving calculations.
5. All questions carry equal marks. Each Question is 20 Marks for a total of 100 Marks.

**DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO**

**SECTION A (ANSWER ALL QUESTIONS IN THIS SECTION)**

**QUESTION ONE**

- a) The main types of information systems used in organization are Office Automation Systems, Transaction processing system, management information system, decision support system and executive information system. State the kind of information system that would be used for the following tasks.
- Generate information related to the sales of a product in a month and the inventory status during that month.
  - Monitor the performance and maintain coordination between the different functional areas, like purchase and accounts payable, in an organization.
  - Identify a problem, an opportunity, or a trend which affects the organization's future growth.
  - Provides support for the traditional office operations like managing the documents, sending messages for interaction, arranging and conducting meetings. [1 mark each]
- b) For the following pieces of information below, state whether they are qualitative or quantitative in nature.
- The E-Learning policy of the university we all love.
  - Census statistics of the nation.
  - A pie chart showing the university's enrolment patterns.
  - A computer analyst describes the problem with a computer system. [1 mark each]
- c) The digital computers that are available nowadays vary in their sizes and types. The computers are broadly classified into four categories namely Microcomputers, Minicomputers, Mainframe computers, and Supercomputers. Identify the classes into which the following devices fall.
- Apple iPhone
  - Samsung Galaxy Tablet
  - Lenovo Laptop
  - Dell OptiPlex Desktop
- [1 Mark each]
- d) There are a number of factors involved that are related to the CPU and have an effect on the overall speed and performance of the computer. State any four such factors. [4 Marks]
- e) The history of computer development is often discussed with reference to different generations of computing devices. There are five generations discussed in the course. Name the technologies associated with the first four generations in chronological order. [4 Marks]

## QUESTION TWO

### PART ONE (Choose the correct answer from the choices provided in each question)

- 1) Which of the following statements is TRUE?
  - (a) ROM loses information when the computer is powered off.
  - (b) ROM chips can be plugged into the motherboard to provide more memory.
  - (c) ROM can't be written to, it's pre-programmed.
- 2) Which of the following requires power to be on in order to maintain the data it stores?
  - (a) ROM
  - (b) RAM
  - (c) Hard disk
  - (d) Flash drive
- 3) What is the name of the terminal, with limited processing capabilities, which is usually connected to a mainframe computer?
  - (a) A dumb terminal
  - (b) An intelligent terminal
  - (c) A terminal adapter
  - (d) A terminal node.
- 4) Which of these statements about computer applications is true?
  - (a) The same version of an application will work on any type of computer.
  - (b) They control devices such as printers and scanners that are attached to the PC.
  - (c) They enable users to carry out specific task such as word processing.
  - (d) They are the only programs that you need to use a PC.
- 5) What type of non-volatile memory would most likely store firmware like a computer's BIOS?
  - (a) EEPROM
  - (b) Hard Disk
  - (c) Tape Drive
  - (d) Flash Drive
- 6) Which of the following has the largest storage capacity?
  - (a) A 900 KB folder
  - (b) A 600 MB CD
  - (c) A 1 TB hard drive
  - (d) A 32 GB flash drive
- 7) Which of the following units of measure do you use to measure the CPU speed?
  - (a) GHz
  - (b) Number of cores
  - (c) Mbps
  - (d) TB
- 8) Which of the following is independent of the address bus?
  - (a) Cache memory
  - (b) Onboard memory
  - (c) Secondary memory
  - (d) Main memory
- 9) Size of the \_\_\_\_\_ memory mainly depends on the size of the address bus.
  - (a) Cache
  - (b) Secondary
  - (c) Main
  - (d) Virtual

- 10) Which of the following is a kind of impact printer?  
(a) Plotter      (b) Dot matrix printer      (c) Inkjet Printer      (d) Laser Printer

**PART TWO (State whether each of the following statements is true or false)**

- 11) Static RAM chips require continuous refreshing for them to store data. *✓*
- 12) Flash memory is used in MP3 players because they are high-speed memories, durable and have low-energy consumption. *✗*
- 13) The content of Programmable ROM can be changed by applying high voltages to them. *✗*
- 14) Memory buffer registers temporarily store data to be sent to memory. *✗*
- 15) The Logic Unit performs comparisons of operands. *✗*
- 16) The instruction cycle has only three (3) steps; namely Fetching, Decoding and Executing. *✗*
- 17) The expansion bus in the computer is made up of two (2) kinds of buses; namely, the data bus and the address bus. *✗*
- 18) Input devices that require data to be entered manually to the computer are identified as human data entry devices. *✗*
- 19) Magnetic Ink Character Recognition can complete the fast processing of multiple choice answers. *✗*
- 20) It takes one clock cycle to perform a basic operation. *✗*

### QUESTION THREE

- a) A computer consists of three main components—(1) Input/output (I/O) Unit, (2) Central Processing Unit (CPU), and (3) Memory Unit. State 6 important registers that are found in the Central Processing Unit [3 Marks]
- b) A bus is a set of electronic signal pathways that allows information and signals to travel between components inside or outside of a computer. Data Bus is used to transfer data between I/O devices and CPU. What are the three most common bus technologies? [3 Marks]
- c) Provide one word to complete each of the following sentences.
- To protect an organisation from an external hacker, every packet of data sent between the organisation's intranet and the Internet should pass through a \_\_\_\_\_.
  - \_\_\_\_\_ is a weakness of system that is left unprotected.
  - \_\_\_\_\_ is the software that is intentionally included into a system with the intention to harm the system.
  - The process of converting a message into meaningless text for security is called \_\_\_\_\_.
- [1 Mark each]
- d) A threat is a potential violation of security and causes harm. A threat can be a malicious program, a natural disaster or a thief. Vulnerability is a weakness of system that is left unprotected.
- What are the two forms of security attack? [2 Marks]
  - True/False - Destructive programs that masquerade as useful programs are called worms. [1 Mark]
  - Give three examples of computer user authentication mechanisms. [3 Marks]
  - State any four characteristics of a security policy. [4 Marks]

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~~6~~

**SECTION B (Answer Any Two questions in this section)**

**QUESTION FOUR**

- a) Kojo a first year student described the software that he was using on a computer as "software for translating the commands given **by the user** into a form that the machine can understand and execute".

- i. Identify the software that Kojo was referring to [1 Mark]  
ii. List four specific examples of such software

~~X/5~~  
~~32~~

- b) Complete this paragraph by filling in the missing words. [8 Marks]

Robert has bought a brand new computer 2GB of RAM and 500Gb hard-disk. When using his computer he can interact with it using the (i)..... or (ii)..... interface. Despite the RAM being 2GB, (iii)..... will allow him to run applications that will require more than 2GB of RAM.

During execution of applications on Roberts computer, each program will be represented as a(iv) ..... in memory and a program called a (v)..... will be responsible for coming up with a schedule for execution. Scheduling can be (vi)..... or (vii).....

Apart from running applications, using (viii)..... software will help Robert to use devices such as printers, scanners and other peripherals.

- c) ✓ The coming of COVID-19 encouraged a lot of people to use on-line platforms to purchase goods. Mary is one of the people students who decided to start buying parts to assemble a desktop computer from [www.ebay.co.uk](http://www.ebay.co.uk). She decided to purchase two 4GB RAM chips costing £7.98 each, one motherboard costing £39.96 and a 1TB hard disk worth £31.26.

Assuming that the cost of shipping all these items is £8.20 and the exchange rate is at K19.58 to £1.

- i. Convert the total amount Mary will pay in Kwacha to Binary [4.5 Marks]  
ii. Convert the total amount Mary will pay in Kwacha to Hexadecimal

~~3~~  
~~63~~  
~~23~~  
~~66~~  
~~62~~  
~~02~~

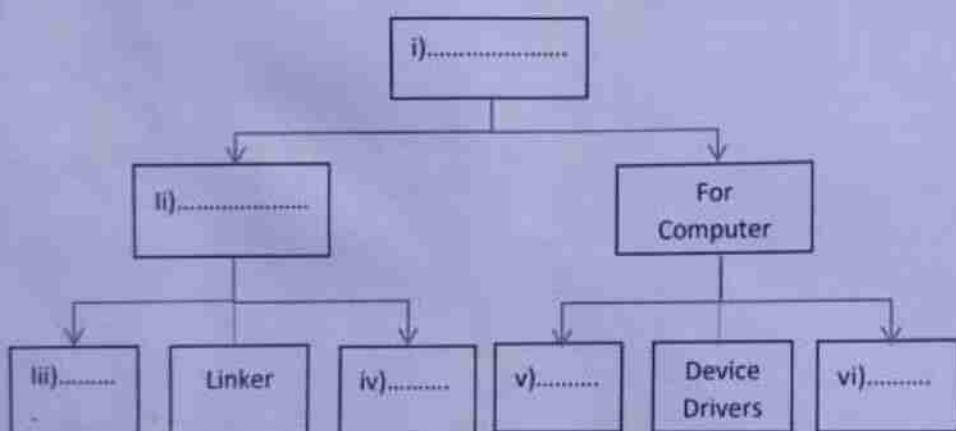
~~102~~  
~~191010111001.0101~~  
~~17/2 9x6~~  
~~15/2 6^2~~  
~~13/2 8^2~~  
~~11/2 6^2~~  
~~9/2 4^2~~  
~~7/2 2^2~~  
~~5/2 1^2~~  
~~3/2 0^2~~  
~~1/2 0^2~~  
~~12/2 1^2~~  
~~10/2 1^2~~  
~~8/2 1^2~~  
~~6/2 1^2~~  
~~4/2 1^2~~  
~~2/2 1^2~~  
~~1/2 1^2~~  
~~15/2 1^2~~  
~~13/2 1^2~~  
~~11/2 1^2~~  
~~9/2 1^2~~  
~~7/2 1^2~~  
~~5/2 1^2~~  
~~3/2 1^2~~  
~~1/2 1^2~~

## QUESTION FIVE

- a) For each of the following identify the type of software acquisition described:
- Joy downloads a full version of a download manager software to try for 30 days but after that she must purchase a full license if she wants to continue using the software
  - Mark uses a version of antivirus software which is meant for personal use on his laptop but he is not allowed to use the same software for his company that has over a 100 computers
  - Jane and her friends are working on a project and they are using Linux Ubuntu on their desktop computers
  - Your friend who is an architect bought a copy of Adobe AutoCAD from a retail shop in Town

[1 Mark Each]

- b) Complete the following diagram by filling in the missing content [6 Marks]



- c) ICT has become popular as it facilitates communication over both short and long distances. For any form of communication to be achieved, a suitable medium must be used.
- Identify the two categories of transmission media used [2 Marks]
  - For each category in (i) give two specific examples [2 Marks]
- d) State the function of each of the following devices
- Router [1 Mark]
  - Gateway [1 Mark]
  - Switch [1 Mark]
- e) State three characteristics that are used to classify networks [3 Marks]

## **QUESTION SIX**

- a) Identify two benefits of using e-mail over sending a hard-copy letter [2 Marks]
- b) Students from CS110 are in the computer Lab conducting research on the worldwide web.
  - i. State three types of networks that these students are using to conduct their research [3 Marks]
  - ii. Name the tool they are likely going to use to search for information on the world wide web and give an example for the specific tool [2 Marks]
  - iii. What is the generic name given to the software they are using to access content on the world wide web [1 Mark]
  - iv. State the name of the basic communication protocol the students are using on the Internet [1 Mark]
  - v. Identify the topology that the students are most likely using [1 Mark]
- c) State the purpose of the following
  - i. SMTP Server [2 Marks]
  - ii. VoIP [2 Marks]
  - iii. BCC [2 Marks]
  - iv. EFT [2 Marks]
  - v. Modem [2 Marks]

27/50

COPPERBELT UNIVERSITY  
CS 110 TEST

INSTRUCTIONS

Answer all questions in the space provided. ANSWERS WRITTEN OUTSIDE THE PROVIDED SPACE WILL NOT BE MARKED. ANSWERS THAT ARE NOT CLEARLY WRITTEN WILL NOT BE MARKED. Total Mark is 50. Marks are indicated beside each question. Time allowed is 1 hr. FAILURE TO FOLLOW THE INSTRUCTIONS WILL RESULT IN LOSS OF MARKS. SPACE FOR ROUGH WORK IS PROVIDED ON PAGE 6. DO NOT UNSTAPLE THE PAPERS

PERSONAL DETAILS

NAME: BLESSINGS TAPVD StudentID: 2014  
GROUP: A PROGRAMME: SMNS Non-Quota (NQ)

QUESTION ONE

For each of the following questions, circle the correct answer(s) from the options provided

- 1) Which one of the following is the correct sequence of the CPU's instruction cycle?  
[A] Decode, Fetch, Execute and store,  [B] Fetch, decode, execute and store  
[C] Fetch, store, decode and execute  [D] Store, execute, fetch and decode
  
- 2) What term in computer terminology refers to a change in technology a computer was being used and is used to distinguish between various hardware technology.  
[A] Development  [B] Classification  [C] Generation  [D] Advancement
  
- 3) What is a firewire used for?  
[A] To connect mouse and keyboard into PC  [B] To connect the computer to a network  
 [C] For video cameras and external hard drives   
[D] for connecting the hard disk drives and network connectors
  
- 4) The entire computer system is coordinated by  
[A] Coordinator Register   [B] The control Unit  [C] The Program Counter (PC),  
[D] Instruction Register
  
- 5) The \_\_\_\_\_ holds the contents of the accessed memory word.  
[A] IR   [B] MBR  [C] MAR  [D] PC
  
- 6) During the execution of a program which gets initialized first?  
 [A] PC  [B] MAR  [C] MDR  [D] IR

- 7) Which of the following is independent of the address bus?  
[A] Secondary memory [B] Main memory [C] Onboard memory  
**[D] Cache memory**
- 8) \_\_\_\_\_ can complete the fast processing of multiple choice answers.  
[A] Optical mark Recognition [B] Magnetic ink character recognition  
[C] Optical character recognition [D] All of the above
- 9) Which computer application scan text and converts into readable form in computer?  
[A] Optical character Recognition [B] Optical Scanner Reader  
[C] Optical character evaluator [D] Optical Marker Recognition
- 10) Which is a kind of impact printers?  
[A] Laser printer [B] Inkjet printer [C] Plotter [D] Dot matrix printer
- 11) From the list below, select all the input devices that can be appropriate for use at self-service checkouts. (A self-service checkout is an automated process that enables shoppers to scan, bag, and pay for their purchases without human assistance).  
[A] Plotter [B] Touch Screen [C] Microphone [D] Mouse  
[E] Standard QWERTY keyboard [F] Joy Stick [G] Touchpad  
[G] Scales [H] Magnetic strip reader [I] Bar code reader
- 12) From the list below, select the input devices which can be used by blind persons to enter data and instructions in a computer.  
[A] Microphone [B] Standard QWERTY keyboard [C] Mouse [D] Plotter  
[E] Bar code reader [F] Braille Keyboard [G] Joy Stick

Questions 13 to 15 are based on the diagram in figure 1. Carefully examine the diagram that is supposed to show the different components that make up the computer system and answer the questions that follow.

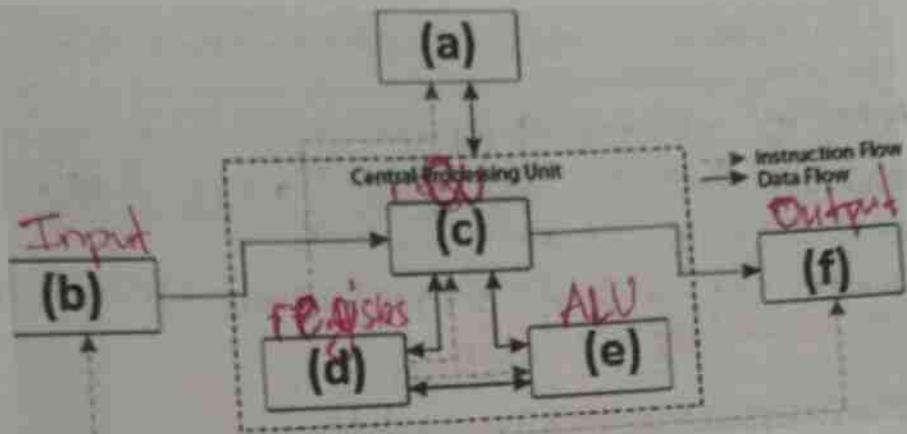


Figure 1

- 13) Select the component that holds the CPU's instruction set, which is a list of all operations that CPU can perform.
- a      b      c      d      e      f
- 14) Select the component that temporarily stores the most recently fetched instruction.
- a      b      c      d      e      f
- 15) Select the component that perform logical operations.
- a      b      c      d      e      f

## QUESTION TWO

A *computer* is an electronic machine that accepts data from the user, processes the data by performing calculations and operations on it, and generates the desired output results. Computer performs both simple and complex operations, with speed and accuracy. In point form, assemble your own computer by answering the following questions:

- a) Other than monitor, RAM chip, processor chip, monitor and hard disk, list 4 distinct off-the-shelf hardware components that you can buy from a vendor to complete your computer. [4 Marks]

\* Keyboard  
 \* Mouse  
 \* Scanner  
 \* Printer      \* Cables  
 \* Power cables

(2)

- b) In one line for each, give reasonable specifications you would go for when buying RAM, processor, hard disk and monitor. [4 Marks]

- RAM of atleast ~~4 GB~~  
★ Processor that can handle Millions of Instruction Per Second  
- Hard disk of atleast ~~500GB~~  
- Monitor of atleast ~~240x300mm~~ Screen resolution  
- Processor of ~~2.5 GHz~~

- c) The digital computers that are available nowadays vary in their sizes and types. The computers are broadly classified into four categories. State the four (4) categories. [4 Marks]

- micro Computers  
- mini Computers  
- mainframe Computers  
- Super Computers

(4)

- d) The computer has evolved from a large-sized simple calculating machine to a smaller but much more powerful machine. The evolution of computer to the current state is defined in terms of the generations of computer. There are five (5) generations altogether starting with the first and ending with the fifth. Indicate these generations from the following technologies. [3 Marks]

- i. Computers used the Integrated Circuit      3rd Generation
- ii. The instructions were written using the assembly language      2nd Generation
- iii. Introduced the Graphical User Interface (GUI)      4th Generation

(3)

### QUESTION THREE

- a) The media access control (MAC) address of a computer in hexadecimal is 3B:5D:52:C4:A9:B8. Represent this MAC address in binary. [6 marks]

~~1110011:1011001:1010000:11000100:10101001:10101110~~

~~1110011:1011001:1010000:11000100:10101001:10101110~~

~~52~~

2	5	11
2	2	0
2	1	1
2	0	0

2	2	10
2	1	1
2	0	0
2	0	0

~~(A)~~

$$5 = 0101_2 \quad 2 = 0010_2 \quad 52_8 = \underline{0101}0010_2$$

- a) If  $01001101$  is the ASCII representation of the letter M, write down the representation of the letters below. [1 mark each]

i. J =  $01001101010$

$$01001101_2 \rightarrow M = 77_{10}$$

ii. Q =  $01010001$

$$\begin{aligned} &M=77, J=74, Q=81 \\ &T=84, V=86 \end{aligned}$$

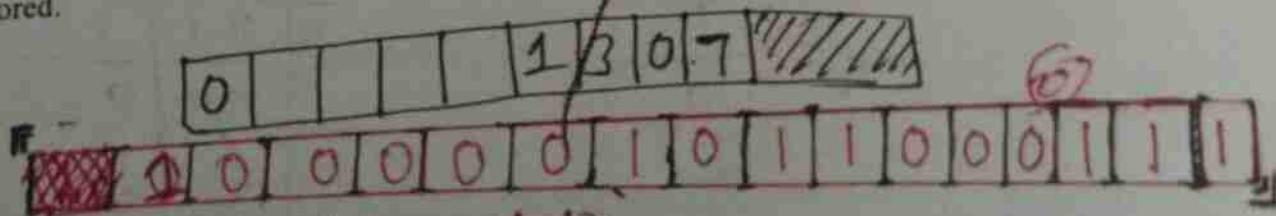
iii. T =  $01010100$

~~(O)~~

iv. V =  $01010110$

The number  $-1307_8$  is to be stored in a 16-bit memory location. Show how this number will be stored. [5 marks]

$$\begin{array}{l} 1 = - \\ 0 = + \end{array}$$



8	8	R
2	7	1
2	3	1
2	0	1
2	0	0

B	D	R
2	0	0
2	0	0
2	1	1
2	0	0

B	Q	R
2	1	1
2	0	0
2	0	0
2	0	0

## CS 110-INTRODUCTION TO COMPUTING TEST 2

INSTRUCTIONS

Answer all questions in the space provided. Total Mark is 60. Marks are indicated beside each question. Time allowed is 90 minutes. DO NOT USE ACRONYMS OR ABBREVIATIONS WHEN ANSWERING THE QUESTIONS.

PERSONAL DETAILS

NAME: Blessings Tapulo STUDENTNO: 2014  
 GROUP: A PROGRAMME: Bachelor Of Science (Non-Quota)

SECTION A

Circle the correct answer(s) from the options provided

- 1) Global network of networks is known as \_\_\_\_\_  
 [a] Intranet     b Internet    [c] Local area network    [d] Extranet
- 2) When the packet with code is transmitted, it is received and processed by every machine on the network. This mode of operation is called  
 [a] Broadcasting     b Multicasting    [c] Uni-casting    [d] Point – to – point
- 3) Which of the following is not an example of a guided medium?  
 [a] coaxial cable     b blue tooth    [c] fiber optic cable    [d] Unshielded twisted pair cable
- 4) A network topology in which there is a central computer connected to two or more client computers is called \_\_\_\_\_.  
 [a] bus network    [b] ring network     c star network    [d] none of these
- 5) Which of the following is a single-user operating system?  
 [a] Windows 7    [b] Mac OS     c MS-DOS    [d] None of these
- 6) Which of the following is not an example of a Real Time Operating System?  
 a VxWorks    [b] RT Linux    [c] eCox    [d] None of the above

Section B

$$Q_1 = 15$$

$$Q_2 = 6$$

$$Q_3 = 14$$

Section A = 16

- 7) Which program runs first after booting the computer and loading the GUI?  
[a] Desktop Manager    [b] File Manager    [c] Windows Explorer    **[d] Authentication**
- 8) What is a Browser?  
[a] An HTML system    [b] A Server  
**[c] A software program that enables you to view web documents.**  
[d] Hierarchical scheme for indicating logical and sometimes geographical venue of a web-page from the network
- 9) What does URL stand for?  
[a] Universal Resource Linker    [b] Uniform Resource Library  
[c] Universal Research Library    **[d] Uniform Resource Locator**
- 10) In computer networking, what is an ISP?  
[a] A piece of computer equipment that allows you to communicate with another computer  
**[b] Internet Service Provider**    [c] Spiders  
[d] A precise definition of how computers interact with one another
- 11) What is a domain suffix?  
**[a] The name of the user's internet system or location**  
[b] An e-mail address that you send another person  
[c] This term refers to unique multiple e-mails    [d] Uniform Resource Locators  
[e] None of the above
- 12) Internet's Initial development was supported by:  
**[a] ARPANET**    [b] IBM    [c] Microsoft    [d] Google
- 13) Which of the following is designed to control the operations of a computer?  
[a] Application Software    **[b] System Software**    [c] Utility Software    [d] User

14) \_\_\_\_\_ is a program that links several object modules and libraries to a single executable program.

- [a] Interpreter      [b] Loader      [c] Assembler       [d] Linker

15) Compiler converts the source code into object-code line by line and creates the executable code.

- [a] True      [b] False

16) Which of the following is not a process state?

- [a] Terminated      [b] Running      [c] Blocked       [d] Execution

17) A program designed to perform specific task is known as

- [a] System software       [b] Application software      [c] Utility programs  
[d] Operating system

18) The operating system hides the details of the hardware from the programmer and provides the programmer with a convenient interface for using the system.

- [a] True       [b] False

19) The processor itself is not a resource so the operating system is not involved in determining how much of the processor time is devoted to the execution of the program.

- [a] True       [b] False

20) In a time-sharing system, a user's program is pre-empted at regular intervals, but due to relatively slow human reaction time, this occurrence is usually transparent to the user.

- [a] True       [b] False

## SECTION B

### QUESTION ONE

(P)

a) List two (2) examples of application software under below:

- i. Word Processing Software

Microsoft Word, Google Docs

- ii. Image Processing Software:

Adobe Photoshop, Picasa

- iii. Web Browser Software:

Internet Explorer, Google Chrome

[6 marks]

b) System utility software is required for the maintenance of a computer. List any four (4) system utilities

(i) Disk Cleaner

(ii) Disk Partitioning

(iii) Network Manager

(iv) Anti-Virus utility

(4)

[4 marks]

c) In addition to the categorization of programming languages into machine language, assembly language, and high-level language, programming languages are also classified in terms of generations in which they have evolved. Indicate these generations from the following

i. .NET (VB.NET, C# etc): — ~~3<sup>rd</sup> & 4<sup>th</sup>~~ Generation

ii. LISP, Prolog: — ~~5<sup>th</sup>~~ Generation

iii. Cobol: — ~~3<sup>rd</sup>~~ Generation

iv. Machine language: — ~~1<sup>st</sup>~~ Generation

v. Assembly language: — ~~2<sup>nd</sup>~~ Generation

[5 marks]

## QUESTION TWO

a) What do the following internet acronyms stand for?

- i. ISDN - Integrated Subscriber Digital Network
- ii. TCP/IP - Transfer Control Protocol / Internet Protocol
- iii. FTP - File Transfer Protocol
- iv. DNS - Digital Network Systems

[4 marks]

b) Computer software can be made available to users in different ways. An example of this is one where the software is bundled along with the purchased hardware. List three (3) other ways in which the software is made available to users other than the one given in the question.

- (i) Free ware Software - Can be downloaded for free on the internet
- (ii) Open Source Software - User is allowed to make changes to the Software
- (iii) Retail Software - Can be bought from retail stores

[3 marks]

c) The operating system translates the commands into a form that the machine can understand and execute. Operating system has two main objectives; List these objectives

- (i) Communicates with the Computer Hardware
- (ii) Provides an interface that is convenient for the user

[2 marks]

## QUESTION THREE

a) Operating systems are classified into different types depending on their capability of processing. Indicate these types from the following

- i. Allows execution of more than one task or process concurrently  
Multi processing Operating System

- ii. For personal computers  
**Single user Multi task Operating System**
- iii. Processing takes place in parallel  
**Multiprocessing Operating Systems**
- iv. Users can communicate with each other  
**Multiuser Operating System**
- v. The processor time is divided amongst different tasks  
**Multiprocessing Operating System**
- vi. Processing is done within a time constraint  
**Real Time Operating System**
- vii. Specific to a device and are less resource intensive  
**Embedded Operating System**

[7 marks]

b) List three Central Processing Unit scheduling algorithms

- (i) First Come First Served (FCFS)
- (ii) Shortest Job First (SJF)
- (iii) Round Robin

[3 marks]

c) A deadlock arises when the four necessary conditions hold true simultaneously in a system.

List these conditions

- (i) Hold and Wait
- (ii) Circular Wait
- (iii) No Pre-emption
- (iv) Mutual Exclusion

(d)

[4 marks]

c) The users can interact with the computer by using two main kinds of interfaces. List these user interfaces

- Command Line Interface (CLI)
- Graphical User Interface (GUI)

(e)

[2 marks]

**COPPERBELT UNIVERSITY**  
**CS 110 TEST**

**INSTRUCTIONS**

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**PERSONAL DETAILS**

NAME: \_\_\_\_\_ StudentID: \_\_\_\_\_

GROUP: \_\_\_\_\_ PROGRAMME: \_\_\_\_\_

**QUESTION ONE**

**For each of the following questions, circle the correct answer(s) from the options provided**

- 1) Which one of the following is the correct sequence of the CPU's instruction cycle?  
[A] Decode, Fetch, Execute and store,    **[B] Fetch, decode, execute and store**  
[C] Fetch, store, decode and execute    [D] Store, execute, fetch and decode
  
- 2) What term in computer terminology refers to a change in technology a computer was being used and is used to distinguish between various hardware technology.  
[A] Development    [B] Classification    **[C] Generation**    [D] Advancement
  
- 3) What is a firewire used for?  
[A] To connect mouse and keyboard into PC    [B] To connect the computer to a network  
**[C] For video cameras and external hard drives**  
[D] for connecting the hard disk drives and network connectors
  
- 4) The entire computer system is coordinated by  
[A] Coordinator Register    **[B] The control Unit**    [C] The Program Counter (PC).  
[D] Instruction Register
  
- 5) The \_\_\_\_\_ holds the contents of the accessed memory word.  
[A] IR    **[B] MBR**    [C] MAR    [D] PC
  
- 6) During the execution of a program which gets initialized first?  
**[A] PC**    [B] MAR    [C] MDR    [D] IR

- 7) Which of the following is independent of the address bus?
- [A] Secondary memory [B] Main memory [C] Onboard memory  
[D] Cache memory
- 8) \_\_\_\_\_ can complete the fast processing of multiple choice answers.
- [A] Optical mark Recognition [B] Magnetic ink character recognition  
[C] Optical character recognition [D] All of the above
- 9) Which computer application scan text and converts into readable form in computer?
- [A] Optical character Recognition [B] Optical Scanner Reader  
[C] Optical character evaluator [D] Optical Marker Recognition
- 10) Which is a kind of impact printers?
- [A] Laser printer [B] Inkjet printer [C] Plotter [D] Dot matrix printer
- 11) From the list below, select all the input devices that can be appropriate for use at self-service checkouts. (A self-service checkout is an automated process that enables shoppers to scan, bag, and pay for their purchases without human assistance).
- [A] Plotter [B] Touch Screen [C] Microphone [D] Mouse  
[E] Standard QWERTY keyboard [F] Joy Stick [G] Touchpad  
[G] Scales [H] Magnetic strip reader [I] Bar code reader
- Note: students should only identify the 5 listed above. If a student puts more than 5 options, the excess should be deducted as a penalty for wrong answers (e.g. if a student puts 8 options including the 5 correct ones, his mark will be  $5-3=2$ . If they give 8 options, and only 4 are correct, their mark will  $4-4=0$ .)**
- 12) From the list below, select the input devices which can be used by blind persons to enter data and instructions in a computer.
- [A] Microphone [B] Standard QWERTY keyboard [C] Mouse [D] Plotter  
[E] Bar code reader [F] Braille Keyboard [G] Joy Stick
- Note: students should only identify the 2 listed above. If a student puts more than 2 options, the excess should be deducted as a penalty for wrong answers (e.g. if a student puts 4 options including the 2 correct ones, his mark will be  $2-2=0$ . If they give 3 options, and only 1 is correct, their mark 0.)**

Questions 13 to 15 are based on the diagram in figure 1. Carefully examine the diagram that is supposed to show the different components that make up the computer system and answer the questions that follow.

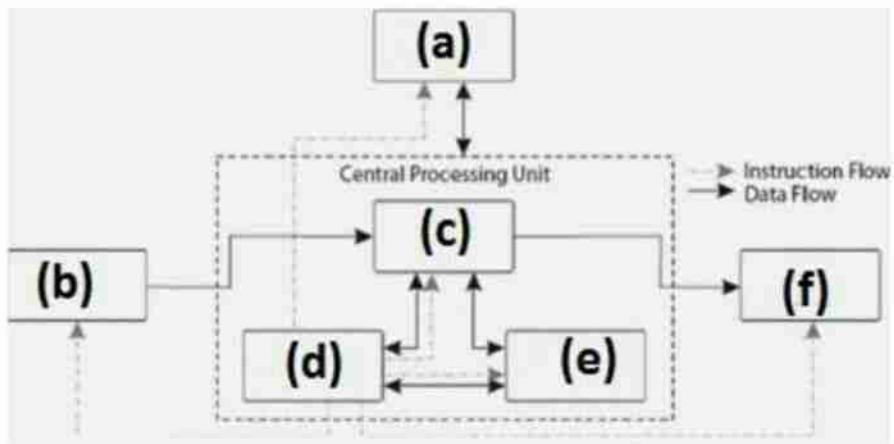


Figure 1

13) Select the component that holds the CPU's instruction set, which is a list of all operations that CPU can perform.

- a      b      c      **d**      e      f

14) Select the component that temporarily stores the most recently fetched instruction.

- a      b      **c**      d      e      f

15) Select the component that perform logical operations.

- a      b      c      d      **e**      f

## **QUESTION TWO**

A computer is an electronic machine that accepts data from the user, processes the data by performing calculations and operations on it, and generates the desired output results. Computer performs both simple and complex operations, with speed and accuracy. In point form, assemble your own computer by answering the following questions:

- a) Other than monitor, RAM chip, processor chip, monitor and hard disk, list 4 distinct off-the-shelf hardware components that you can buy from a vendor to complete your computer.

[4 Marks]

**Keyboard, mouse, cpu casing/housing, power cables, (you can also includes other components that can be bought off the shelf as long as they are not listed in the question)**

- b) In one line for each, give reasonable specifications you would go for when buying RAM, processor, hard disk and monitor. [4 Marks]

**RAM: Accept answers from 4GB going up (4gb, 8gb, 16gb, 32 gb) (do not accept answers such as big enough)**

**Hard disk size: accept answers from 120GB going up (120, 160, 200,...) (do not accept answers such as big enough)**

**Monitor: accept answers: 11 inches, 12 inches, 14 inches, 15 inches, 17 inches, 22 inches (do not accept answers such as big enough)**

- c) The digital computers that are available nowadays vary in their sizes and types. The computers are broadly classified into four categories. State the four (4) categories.

[4 Marks]

**Main frame, mini, micro and super computers**

- d) The computer has evolved from a large-sized simple calculating machine to a smaller but much more powerful machine. The evolution of computer to the current state is defined in terms of the generations of computer. There are five (5) generations altogether starting with the first and ending with the fifth. Indicate these generations from the following technologies. [3 Marks]

- i. Computers used the Integrated Circuit

**Third Generation**

- ii. The instructions were written using the assembly language

**Second Generation**

- iii. Introduced the Graphical User Interface (GUI)

**Fourth generation**

### **QUESTION THREE**

- a) The media access control (MAC) address of a computer in hexadecimal is 3B:5D:52:C4:A9:B8. Represent this MAC address in binary. [6 marks]

3= 0011, B = 1011, 5 = 0101, 2 = 0010, C=1100, A =1010, 8 = 1000, 4 = 0100, D=1101 9=1001

**3B:5D:52:C4:A9:B8 = 0011 1011: 0101 1101: 01010010 : 1100 0100: 1010 1001: 1011 1000**

**Or 0011 10110101 1101 01010010 1100 01001010 1001 1011 1000 (excluding : )**

**Or 11 10110101 1101 01010010 1100 01001010 1001 1011 1000 (excluding leading 0s)**

**Instruction: award 1 mark for each number correctly converted to base 2**

- a) If 01001101 is the ASCII representation of for the letter M, write down the representation of the letters below. [1 mark each]

i. J = **01001010**

ii. Q = **01010001**

iii. T= **01010100**

iv. V = **01010110**

The number -1307<sub>8</sub> is to be stored in a 16-bit memory location. Show how this number will be stored. [5 marks]

-	1	3	0	7	
1	000	001	011	000	111 = 1000001011000111 <sub>2</sub>

**Instruction: award 1 mark for correctly indicating the value for the sign, 1 mark for filling in the 0s after the sign, and 1 mark for each number correctly converted to base 2**

Blessings Tapulo



## THE COPPERBELT UNIVERSITY

### SCHOOL OF INFORMATION AND COMMUNICATION TECHNOLOGIES

2020/2021 SESSIONAL EXAMINATIONS

CS 110 – INTRODUCTION TO COMPUTING

#### INSTRUCTIONS

- 1) Time allowed is three (3) hours
- 2) There are seven (7) questions in this paper. Attempt any five (5) questions in this paper.
- 3) Read the questions carefully before answering. Identify words such as State, List, and Outline etc, and proceed as appropriate. If the question asks for a given number of points, you risk losing marks by supplying more than required of you.
- 4) Please do not forget to indicate your student ID and the Group you belong to on the answer booklet that will be provided.
- 5) Do not use acronyms or abbreviations.
- 6) All questions carry equal marks. Each Question is 20 Marks for a total of 100 Marks.

**DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO**

### **QUESTION ONE**

a) Match the following devices with the word that best describes their function e.g. **keyboard** equals **input**. You can use words more than once.

- |                      |          |
|----------------------|----------|
| i) Hard disk         | (1 mark) |
| ii) Mobile telephone | (1 mark) |
| iii) Printer         | (1 mark) |
| iv) Modem            | (1 mark) |

b) Match each of the following input devices with two (2) of the statements shown in the table below.

- |           |           |
|-----------|-----------|
| i) OCR    | (2 marks) |
| ii) OMR   | (2 marks) |
| iii) MICR | (2 marks) |

1. It requires clear text and errors are common.	3. It can read numbers quickly with few errors.	5. It can complete the fast processing of multiple choice answers.
2. It converts scanned text to a word processed file.	4. It recognises the position of marks on paper.	6. It recognizes characters that are written in magnetic ink.

c) List the main characteristics of the following types of software licence:

- |                    |           |
|--------------------|-----------|
| i) Site licences   | (2 marks) |
| ii) Software lease | (2 marks) |

d) State two (2) benefits of each the following types of software:

- |                                |           |
|--------------------------------|-----------|
| i) Hosted software             | (2 marks) |
| ii) Locally installed software | (2 marks) |

e) State how an operating system manages memory and CPU time to allow the computer to multitask.

## **QUESTION TWO**

Choose correct terms from the given list below to complete the paragraph in (a).

- Encryption
- File name
- Firewall
- HTML tags/text
- IP Address
- Protocol
- Proxy server
- SSL Certificate
- Web server name

a) A user enters a URL. The web browser breaks up the URL into three components (i)....., (ii)....., and (iii).....

The web server returns the selected web page. The web browser reads the (iv)..... from the selected web page and shows the correctly formatted page on the user's screen. A (v)..... is used between the user's computer and the network to examine the data traffic to make sure it meets certain criteria. To speed up access to web pages next time, a (vi)..... is used between the computer and the web server; this device uses a cache to store the website home page after it has been accessed for the first time. (5 marks)

b) A non-quota student is using the Internet for the first time to do some online shopping. She visits a website that tells her that it uses cookies.

- i) Briefly explain what is meant by the term cookies (2 marks)
- ii) List four (4) examples of the use of cookies. (4 marks)

c) Expand each of the following acronyms:

- i) HTTPS;
- ii) IMAP;
- iii) IPsec;
- iv) RSVP;
- v) POPv3;
- vi) ARP;
- vii) VoIP (7 marks)

d) What makes a connection a broadband connection? (2 marks)

### **QUESTION THREE**

- a) List the four (4) key features of internal memory (4 marks)
- b) State five (5) key features of external memory (2.5 marks)
- c) Distinguish between DRAM and SRAM giving key features in each (4 marks)
- d) What do the following acronyms stand for: (2.5 marks)
  - i) POST
  - ii) EPROM
  - iii) PROM
  - iv) EEPROM
  - v) BIOS
- e) Distinguish between sequential and direct access devices (3 marks)
- f) List four (4) features of each of the following storage media:
  - i) Magnetic tape
  - ii) Magnetic disk(4 marks)

### **QUESTION FOUR**

Three Universities in a large city are to merge and become a single University spread across the three sites. Each University has a Local Area Network (LAN) and these networks are to be joined together to form a Wide Area Network (WAN).

- a) State two (2) differences between a LAN and a WAN. (4 marks)
- b) List four (4) advantages to the merged University of using the new WAN. (4 marks)
- c) State the problems that could occur when using the new WAN. (4 marks)
- d) The majority of computers sold to consumers today come pre-equipped with WLAN; List four (4) benefits of WLAN? (4 Marks)
- e) List four (4) major inherent limitations that come with WLAN? (4 Marks)

### QUESTION FIVE

- a) Complete each of the following sentences by using a word from the table below.

Storage	Knowledge	Organisation	System
Application	Master Terminal	Optical	Mandatory
Output	Virus	Pilot	Memory

- i) A/An Organisation is considered to be a group of people who work together towards a common goal.
- ii) Information which is given context becomes Knowledge.
- iii) Access control is a security strategy that restricts the ability individual resource owners have to grant or deny access to resource objects in a file system.
- iv) A/An virus is a program that often interferes with computer systems or damages data.
- v) Peripherals can be divided into three categories: input, output and ..... peripheral devices.
- vi) Application software is also called end-user programs.
- vii) A computer master terminal is an electromechanical hardware device which is used for entering data into and displaying data from a computer system.
- viii) Display hardware such as a monitor is used to display the results of computer data that has been processed.
- ix) A/An Optical disc such as a DVD, stores digital data.
- x) Files that typically contain descriptive data are referred to as ..... files.  
(10 × 1) (10 marks)

- b) The media access control (MAC) address of a network device in hexadecimal is 1C:4D:33:C6:A7:B9. Represent this MAC address in binary (2 marks)
- c) If 01010001 is the ASCII representation for the letter Q, write down the representation of the following words.  
i) TO  
ii) ME  
iii) YAL (6 marks)
- d) What number does the below given floating point format represent in base 8 format.  
1000001011000111<sub>2</sub> (2 marks)

1 0 1 3 0 1 . 0 0 0 1 1 1  
5  
1+2+4  
1+2

**COPPERBELT UNIVERSITY**  
**CS 110 TEST**

**INSTRUCTIONS**

*Answer all questions in the space provided. **ANSWERS WRITTEN OUTSIDE THE PROVIDED SPACE WILL NOT BE MARKED.** Do not use abbreviations or acronyms when answering the questions. Total Mark is 60. Marks are indicated beside each question. Time allowed is 1 hr 15 mins. **FAILURE TO FOLLOW THE INSTRUCTIONS WILL RESULT IN LOSS OF MARKS.***

**QUESTION ONE**

(a) The computer has evolved from a large-sized simple calculating machine to a smaller but much more powerful machine. The evolution of computer to the current state is defined in terms of the generations of computer. There are five (5) generations all together starting with the first and ending with the fifth. Indicate these generations from the following technologies.

[1 Mark Each]

- (i) Computers used the Integrated Circuit
- (ii) The instructions were written using the assembly language
- (iii) Computation time was in staggering milliseconds
- (iv) Introduced the Graphical User Interface (GUI)

(b) The digital computers that are available nowadays vary in their sizes and types. The computers are broadly classified into four categories namely Microcomputers, Minicomputers, Mainframe computers, and supercomputers. Identify the classes into which the following devices fall.

[1 Mark per point]

- (i) Apple iPhone \_\_\_\_\_
- (ii) Samsung Galaxy Tablet \_\_\_\_\_
- (iii) Lenovo Laptop \_\_\_\_\_

(c) Registers are high-speed storage areas within the CPU, but have the least storage capacity. Registers are not referenced by their address, but are directly accessed and manipulated by the CPU during instruction execution. They store data, instructions, addresses and intermediate results of processing. Which Register :

- (i) Stores the result of arithmetic and logic operations
- (ii) contains the current instruction most recently fetched.
- (iii) stores the operands and any other data.
- (iv) contains the address of next location in the memory to be accessed.

[1 Mark Each]

(d) The Motherboard has a certain number of input/output sockets that are connected to the ports and interfaces found on the rear side of a computer. You can connect external

devices to the ports and interfaces, which get connected to the computer's motherboard. Write the full names of the following connections that can be found at the back of the computer.

[1 Mark Each]

- (i) SCSI
- (ii) VGA

(e) A computer is an electronic machine that accepts data from the user, processes the data by performing calculations and operations on it, and generates the desired output results. Computer performs both simple and complex operations, with speed and accuracy. In point form, assemble your own computer by answering the following questions:

- (i) Other than monitor, RAM chip, processor chip and hard disk, list four distinct off-the-shelf hardware components that you can buy from a vendor to complete your computer. [4 Marks]
- (ii) In one line for each, give reasonable specifications you would go for when buying RAM (capacity), Processor (actual speed), and Hard Disk (capacity). [3 Marks]

RAM (capacity): \_\_\_\_\_

Processor speed: \_\_\_\_\_

Hard Disk Capacity: \_\_\_\_\_

## **QUESTION TWO**

*A computer interacts with the external environment via the input-output (I/O) devices attached to it. Input device is used for providing data and instructions to the computer. After processing the input data, computer provides output to the user via the output device.*

- (a) State three (3) input devices that can be used at a self-service checkouts. (A self-service checkout is an automated process that enables shoppers to scan, bag, and pay for their purchases without human assistance). [3 marks]
- (b) State the input device that can be used to capture the following data
  - (i) The information that appears at the bottom of a check. This includes the bank's routing number, the customer's account number, and the check number.
  - (ii) To recognize text inside images, such as scanned documents and photos
  - (iii) capturing human-marked data from document forms such as surveys and tests. They may be used to read questionnaires, multiple choice examination paper in the form of lines or shaded areas.

- (iv) to convert hand-drawn images into a format suitable for computer processing. Images are usually drawn onto a flat surface with a stylus and then appear on a computer monitor or screen.

*The computer's memory stores data, instructions required during the processing of data, and output results. Storage may be required for a limited period of time, instantly, or, for an extended period of time.*

- (c) Name the two categories of Primary Memory and, for each category, list two subcategories.  
[First category] \_\_\_\_\_

[Subcategory] \_\_\_\_\_

[Subcategory] \_\_\_\_\_

[Second Category] \_\_\_\_\_

[Subcategory] \_\_\_\_\_

[Subcategory] \_\_\_\_\_

- (d) Name 2 methods that are used to access information stored in storage devices.

[2 Marks]

- (e) State briefly any four (4) key features of secondary memory of the computer. [4 marks]

### **QUESTION THREE**

- (a) In each of the cases below, state the software procurement method that has the listed characteristics:

- Designed to demonstrate the functions of a software; provides a restricted set of features.
- Software whose source code is available to the public; Software has no copyright owners.
- Software whose source code is available to the public; Software can be modified according to the guidelines laid down by the creator.
- Software that users can try out for a specific period of time as specified in the license; Once the trial period is over, the user has to purchase it or uninstall it.

- (b) State whether the following applications are tailor-made (Bespoke) software or Generic software.

- Nkana Water and Sewerage Billing System
- Point of Sale software used by Shoprite
- Microsoft Word application

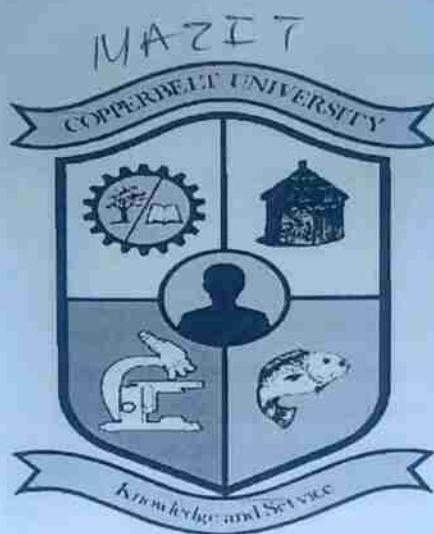
- (c) System utility software is required for the maintenance of computer. System utilities are used for supporting and enhancing the programs and the data in computer. Which Utility Software can be used for:

[2 Marks]

- (i) Clearing the disk of unnecessary files: \_\_\_\_\_

(ii) Reducing the separation of files by concatenating parts stored in separate locations on a disk. :

(d) The media access control (MAC) address of a computer in hexadecimal is 3A:34:52:C4:69:B8. Represent this MAC address in binary. [12 marks]



**THE COPPERBELT UNIVERSITY  
SCHOOL OF MATHEMATICS AND NATURAL SCIENCES**

**2018/19 SESSIONAL EXAMINATIONS**

**CS 110 – INTRODUCTION TO COMPUTING**

**INSTRUCTIONS**

- ⊕ Time allowed is three (3) hours
- ⊕ There are five (5) questions in this paper. **ANSWER ALL QUESTIONS IN SECTION A AND ANY ONE (1) QUESTION IN SECTION B.**
- ⊕ Read the questions carefully before answering. Identify words such as State, List, and Outline etc, and proceed as appropriate. If the question asks for a given number of points, you risk losing marks by supplying more than required of you.
- ⊕ **DO NOT** use acronyms or abbreviations.
- ⊕ You are not allowed to use calculators in this paper
- ⊕ All questions carry equal marks. Each Question is 25 Marks for a total of 100 Marks.

## **SECTION A (ANSWER ALL QUESTIONS IN THIS SECTION)**

### **QUESTION ONE**

- a) Security service are the services that are provided by a system for a specific kind of protection to the system resources. In each of the following statements, state the service being provided.
- i. Alice is assured that Bob will not deny having received the message from her. *- Integrity*
  - ii. Alice is assured that she will be able to use the service whenever she needs to. *- Availability*
  - iii. Bob is assured that only Alice will receive the message he sent. *- Confidentiality*
  - iv. Alice is assured that her message to Bob will not be modified while being transmitted.
  - v. Bob is assured that he will be the only one who will see his private messages. [10 marks]
- b) The ATM at Magic Bank converts data into unrecognizable characters that can be deciphered by the receiving end of the transaction using a key code. This is an example of what security measure? [2 marks]
- c) To enter a secure room, Secret Agent Jane must show her finger print, eye, and speak a password. This is an example of what type of security feature? [2 marks]
- d) List any four (4) internet security threats. [8 marks]
- e) State any three (3) measures that you can take to safeguard home computers and devices from internet security threats. [3 marks]

### **QUESTION TWO**

Networking of computers provides a communication link between the users, and provides access to information. Networking of computers has several uses such as communication, resource sharing, and information sharing.

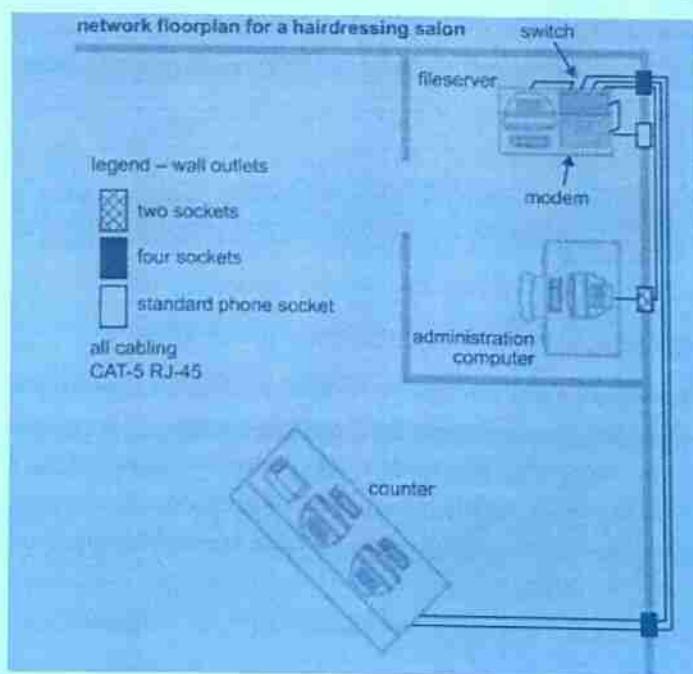
*STP  
UTP*

- a) Mr. Goodman, a small business has contracted Cartier cabling Inc. (CCI) to set up wired network solutions for his business. You are the network technician at CCI. What are the types of wired communication media that are available to complete the task? [6 marks]
- b) There are three modes of transmission we have are Simplex, Half-Duplex and Full-Duplex transmission modes. State the mode of transmission involved in the communications.
- i. Communication between a computer and a printer *- Coaxial*
  - ii. Communication between a computer and a projector. *- Fiber*
  - iii. Communication between a computer and a keyboard
  - iv. Communication using analog telephones
- c) Which of the following wireless transmission technologies are line-of-sight?
- i. Radio Frequencies
  - ii. Microwave Frequencies
  - iii. Infrared Transmission
  - iv. Bluetooth Transmission
- [4 marks]
- [4 Marks]

- d) The cables are used to transmit data in the form of signals from one computer to another. But cables cannot transmit signals beyond a particular distance. Moreover there is a need to connect multiple computers and devices. A concentrator is a device having two or more ports to which the computers and other devices can be connected. Which concentrator
- is used to connect two LAN segments; it forwards complete and correct frames to the other segment?
  - is also used to divide a network into separate broadcast domains to reduce network traffic while maintaining connectivity between the computers.
  - connects multiple computers in a network or different segments of the same network?
  - has a simulated network environment for each computer connected to it?
  - is used to connect two WANs.
  - determines which way is the shortest or fastest in a network, and routes packets accordingly.
  - does not broadcast data, but sends the data from the source computer to the destination computer,
- [7 Marks]

- Router  
- Firewall  
- Repeater

- e) The diagram below shows the layout for a computer network used in a hairdressing salon.



- State the **topology** of the network above. [2 marks]
- State the **type** of network used above. [2 marks]

### **QUESTION THREE**

*Answer the following questions relating to computer software*

- a) Complete each of the statements below using the options listed below.
- Operating system
  - Application software
  - Utilities software
  - Programming software
- i. \_\_\_\_\_ is the software which provides the computer with a set of instructions it can understand.
- ii. \_\_\_\_\_ is a program that controls hardware and software.
- iii. \_\_\_\_\_ is software which allows end users to perform and fulfil their tasks.
- iv. \_\_\_\_\_ is software which manages system resources. [4 marks]
- b) Mary is connecting her computer to her printer. What specific software will Mary most likely need to install to do this? [2 marks]
- c) The table below shows the generations of programming languages. Give one example of the programming language for each generation. [5 marks]

First Generation	
Second Generation	
Third Generation	
Fourth Generation	
Fifth Generation	

*Computer hardware is the collection of physical parts of a computer system. Answer the following questions relating to computer hardware*

- d) Name two (2) input devices which can be used by blind persons to enter data and instructions in a computer [2 marks]
- e) State four (4) input devices that can be used at a self-service checkouts. (A self-service checkout is an automated process that enables shoppers to scan, bag, and pay for their purchases without human assistance). [4 marks]
- f) Complete each of the statements below using the options listed below.
- OMR
  - MICR
  - OCR
- i. \_\_\_\_\_ recognizes characters that are written in magnetic ink.
- ii. \_\_\_\_\_ requires clear text and errors are common.
- iii. \_\_\_\_\_ converts scanned text to a word processed file.

- iv. \_\_\_\_\_ can read numbers quickly with few errors.  
v. \_\_\_\_\_ recognises the position of marks on paper.  
vi. \_\_\_\_\_ can complete the fast processing of multiple choice answers.

[6 marks]

- g) Name the following components in a computer system. [2 marks]
- i. It takes digital data from the computer system and turns it into visible images.
  - ii. It turns digital computer data into analogue audio signals.

## **SECTION B (Answer one question in this section)**

### **QUESTION FOUR**

- a) A fellow student has asked your advice on a purchase of a personal computer. What hardware and software specifications would you recommend given the following facts:
- i. Courses to be completed require extensive data analysis and research
  - ii. Safeguarding the computer and its data is very important
  - iii. Keeping the computer running smoothly at all times is a must

NOTE: In your recommendation, you should include the following information:

- Processor speed
- RAM
- Hard disk storage
- Ports that the computer should have
- Type of computer (Desktop/Laptop/personal digital assistant/tablet/smartphone, etc)
- OEM Software the computer should have
- Any additional hardware or software that should be considered

[14 marks]

- b) Answer the following questions relating to data representation in the computer. (You should show your working)
- i. Convert  $D3B_{16}$  directly to binary. [3 marks]
  - ii. Convert  $29.48_{16}$  to decimal. [4 marks]
  - iii. The number 489 is to be stored in a 16-bit memory location. Show how this number will be stored. [4 marks]

## QUESTION FIVE

- a) A student wishes to encrypt the messages: "**DO NOT ATTEMPT THIS QUESTION**" and "**THIS WARNING IS IN PLAIN SIGHT**" using the Caesar Shift Cipher method. The Caesar Shift Cipher is a simple substitution cipher where the ciphertext alphabet is shifted a given number of spaces. Figure 1 shows a sample of how he will do the encryption. In this encryption, the letter A will be replaced by X, B by Y, C by Z, D by A, etc.

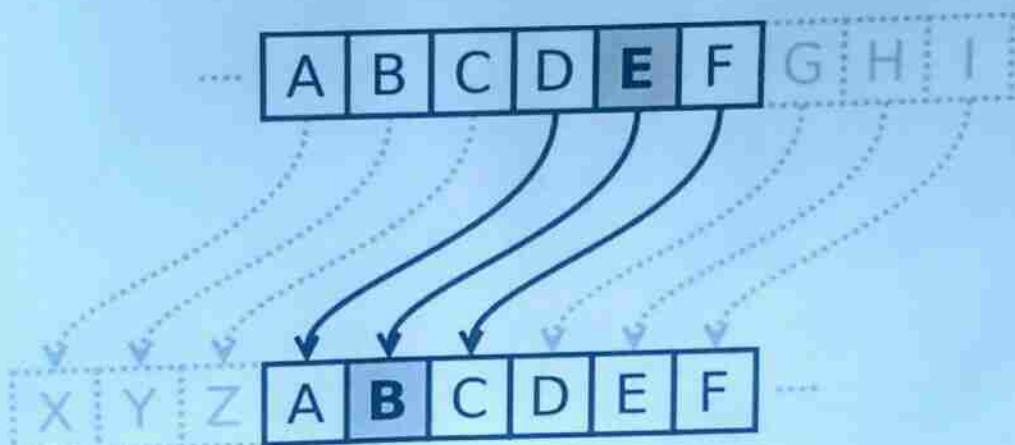


Figure 1

- i. State how the ciphertext is being generated. [2 marks]
  - ii. Generate the ciphertext for the plain text, "**THIS WARNING IS IN PLAIN SIGHT**". [3 marks]
  - iii. Generate the ciphertexts for the plain text, "**DO NOT ATTEMPT THIS QUESTION**". [2 marks]
  - iv. The ciphertext of a message is "**TEV AFA VLR AL QEFP NRBPQFLK**". Decipher this message and write down the plain text. [3 marks]
  - v. Write down any two weaknesses of this method of encryption. [4 marks]
- b) Perform the following binary calculations using 2's complement
- i.  $10110_2 - 11010_2$  [3 marks]
  - ii.  $10100.01_2 - 11011.10_2$  [4 marks]
- c) Calculate the result of subtracting  $100101_2$  from  $110101_2$  using 1's complement [2 marks]
- d) What is the 1's complement of the number  $10001.001_2$ ? [2 marks]

- GLASSMAN -  
2016

## COPPERBELT UNIVERSITY

SCHOOL OF MATHEMATICS AND NATURAL SCIENCES  
INTRODUCTION TO COMPUTING (CS 110) TEST ONE

## INSTRUCTIONS

Answer all questions in the space provided. Total Mark is 60. Marks are indicated beside each question. Time allowed is 1 hour 30 minutes. No calculators or cell phones should be used in this test. DO NOT USE ACRONYMS/ABBREVIATIONS IN ANSWERING THE QUESTIONS.

## PERSONAL DETAILS

GROUP: B NAME: DAHITSO TEMBOSID: 17110556

## QUESTION ONE

- (a) The history of computer development is often discussed with reference to different generations of computing devices. In computer terminology, the word 'generation' is described as a stage of technological development or innovation. Carefully examine the properties listed below and identify which generation they fall under. [2 Marks]

- (i) They are the first to introduce graphical user interfaces

*Third Generation**✓ fourth*

- (ii) They use magnetic drums for memory.

*first generations**✓*

- (iii) They have multiple processors and perform parallel processing.

*fourth generation**✓ fifth*

- (iv) They are based on integrated circuit technology.

*Third Generation**✓*

- (b) Different types of computers process the data in different manner. According to the basic data-handling techniques, computers can be classified into three categories. What are they? [3 Marks]

*Supercomputers - Digital*

[3 Marks]

~~Mainframes~~ - Analog  
~~Microprocessors~~ - Hybrid

- (c) The processor or the CPU is the main component of the computer. List four factors that should be considered when selecting the processor for your computer. [2 Marks]

*Speed, storage capacity, speed, Register size*

- (d) True/False. Processor speed is measured in bytes. *True*

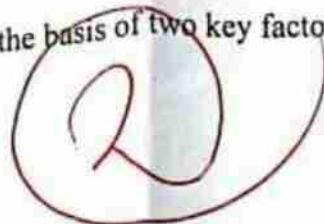
[1 Mark]

## QUESTION TWO

The computer's memory stores data, instructions required during the processing of data, and output results. Storage may be required for a limited period of time, instantly, or, for an extended period of time.

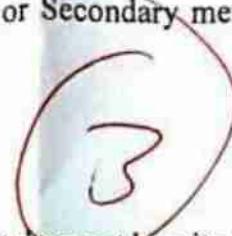
- (a) The memory is characterized on the basis of two key factors. What are two key factors? [2 Marks]

- Storage capacity
- Rate of Access



- (b) Memory is organized as either Primary or Secondary memory. Give three (3) examples of volatile primary memory. [3 Marks]

- Cache memory
- Registers
- Random Access Memory



- (c) ROM is a non-volatile primary memory. It does not lose its content when the power is switched off. Under what category of ROM does Flash Memory fall? [1 Mark]

~~Erasable Programmable Read Only Memory X EEPROM~~

- (d) Hexadecimal numbering if used for Memory Addressing on computers. If the address of an item in memory is  $0x5DE$  (that is  $5DE_{16}$ ), what would the address read in Decimal? Show your working. [3 Marks]

5 10 11 12 13 14  
a c p e

to base	Number (Quintal)	Quotient	51514 5131
10	51314		<u>51314</u>
10	5131	4	<u>5131</u>
10	513	1	<u>513</u>
10	51	3	<u>51</u>
10	5	1	<u>5</u>
	0	5	<u>5</u>

$$(5DE_{16}) = 51314_{10}$$

b

- (c) If the data to be stored at the address indicated in (d) above is 1001, what is the data to be stored, represented as a 16 bit binary number? Show your working. [3 Marks]

1061

$$1 \times 16^3 + 0 \times 16^2 + 0 \times 16^1 + 1 \times 16^0 \\ 1536 + 0 + 16 + 1 \\ 1553$$

$$\begin{array}{r} 16 \\ \times 16 \\ \hline 96 \\ 16 \\ \hline 256 \\ \times 16 \\ \hline 1536 \end{array}$$

- (f) Hexadecimal and Octal Systems are used to represent colors. If the color is written as BEEF<sub>16</sub>. How many bits make up that color? Also, how can that color be written in Octal? Show your working. [3 Marks]

A	B	C	D	E	F
10	11	12	13	14	15

1114.1415

(1114)

(1415)

$$1 \times 8^3 + 1 \times 8^2 + 1 \times 8^1 + 2 \times 8^0$$

$$512 + 64 + 8 + 4$$

$$\begin{array}{r} 64 \\ 12 \\ \hline 76 \\ 512 \\ \hline 588 \end{array}$$

$\times 16$

### QUESTION THREE

- (a) A process is a program in a state of execution. It is a unit of work for the operating system. A process changes its state as it is executed. List any 4 possible states that a process can be into? [2 Marks]

Fetching, decoding, Execution, Storing

New, Ready, Running, Waiting, Terminated

- (b) Scheduler is a component of the operating system that is responsible for scheduling transition of processes. There are many different CPU scheduling algorithms that are used to schedule the processes. From the ones discussed in class, which scheduling algorithm:

- (i) Will likely lead to starvation? ✓ ① [1 Mark]

Hold and wait ✓ Shortest job first

- (ii) Does not support non pre-emptive scheduling? [1 Mark]

Shortest job first ✓

- (c) What do you call the technique that allows processes to communicate with one another to prevent a situation where one process disrupts another process? [2 Marks]

Synchronization ✓

- (d) When two or more processes execute at the same time, independent of each other, they are called parallel processes. [2 Marks]

Concurrent

- (e) Virtual memory allows the execution of those processes that are not completely in memory. When a process executes and a page is required, that page is swapped-in into the memory. This allows execution of large-sized programs without loading them completely into the memory. [2 Marks]

- (f) A File is a collection of related information stored on a secondary storage. The file extension refers to the two, three or four letters at the end of the file name that can be used to identify what type of file it is and what program can open it.

[1 Mark]

#### QUESTION FOUR

- (a) Software is a set of programs that instructs the computer about the tasks to be performed. Software tells the computer how the tasks are to be performed; hardware carries out these tasks. The table below shows different categories of software. Fill the table with examples of software released under the open source license (i.e. Open Source Software). [3 Marks]

SOFTWARE TYPE	EXAMPLE SOFTWARE
Operating System	Windows 7 Linux
Office Suite	Microsoft Excel Open Office
Web browser	Chrome Mozilla Firefox

- (b) A Programming Language consists of a set of vocabulary and grammatical rules, to express the computations and tasks that the computer has to perform. Give two examples of High Level Programming Languages. [2 Marks]

Java  
Fortran

② C++  
Visual Basic  
C

[2 Marks]

- (c) Translator software is used to convert a program written in high-level language and assembly language to a form that the computer can understand. Give three examples of Translator Software. [3 Marks]

Assembler, Interpreter  
Compiler

② Assembly  
Interpreter  
Compiler

- (d) The choice of programming language for writing a program depends on the functionality required from the program and the kind of program to be written. What two programming languages are you likely to use if you are developing an expert system? [2 Marks]

- High level, Assembly

② C++  
Java  
LISP  
Prolog

#### QUESTION FIVE

A computer interacts with the external environment via the input-output (I/O) devices attached to it. Input device is used for providing data and instructions to the computer. After processing the input data, computer provides output to the user via the output device.

- (a) What are the two classes of input devices?

Human data and Source data devices

[2 Marks]

②

- (b) Keyboard is a common input device. It is provided along with the computer, and is easy to use. It is used for entering the text data. Standard Keyboards are called QWERTY keyboards. [2 Marks]

(c) How many function keys (those prefixed with F) are you likely to find on a keyboard you have mentioned in (b) above? 12 [1 Mark]

10

(d) What are the two classes of output devices? For each class, give two examples (excluding Monitor). [3 Marks]

- Soft copy (visual display terminal)
  - Hard Copy (Printer and Plotter)
- Output devices (visual display terminal and Audio response)

(e) Monitor is a common output device. The monitor is provided along with the computer, to view the displayed output. On the specification of a monitor, what do the following measurement units represent? [4 Marks]

(i) 1024x768 Resolution ✓ Screen Resolution

(ii) 16:9 Aspect ratio

(iii) 72dpi dots per inch ✓ Dot Pitch

(iv) 60Hz frequency ✓

(f) The I/O ports are the external interfaces that are used to connect input and output devices like printer, modem and joystick to the computer. What do the following I/O acronyms stand for? [4 Marks]

(i) HDMI

High Definition Multimedia Interface ✓

(ii) SCSI

(iii) VGA

Video Graphic Adapter

(iv) USB

Universal Serial Bus

35.5

**COMPUTER SCIENCE DEPARTMENT**  
**INTRODUCTION TO COMPUTING (CS 110)**  
**TEST 2 (22 JUNE, 2018)**

**INSTRUCTIONS**

*Answer all questions in the space provided. All marks add up to 60. Marks are indicated beside each question. Time allowed is 90 minutes. DO NOT USE ACRONYMS when answering questions.*

**PERSONAL DETAILS**

GROUP: B NAME: DATITSO TEMBO SID: 17110556

**QUESTION ONE (COMPUTER NETWORKS)**

- (a) A computer network is an interconnection of two or more computers. Networking of computers has several uses. Name the four that were discussed in class. [2 Marks]

- Resource sharing  
- Sharing of information (2)  
- As a communication medium  
- For backup and support

- (b) When communicating on a network, data is sent from one computer to another over a transmission medium. The transmission media can be grouped into guided media, and unguided media. Other than Twisted Pair Cables, give 2 more examples of guided transmission media. [1 Mark]

- Copper wire  
- Optical fibre

- (c) Computer network is broadly classified into three types. What are they? [1.5 Marks]

- 1.5  
- Local Area Network (LAN)  
- Metropolitan Area Network (MAN)  
- Wide Area Network (WAN)

- (d) What three characteristics are used to distinguish the different network types you have stated above? [1.5 Marks]

- Transmission Technology  
- Size of Network  
- Network Topology

(e) A concentrator is a device having two or more ports to which the computers and other devices can be connected. Which concentrator:

- i. It connects computers in a network or different segments of the same network and each computer attached to it has a simulated LAN segment. Repeater ~~switch~~
- ii. It is used to interconnect the networks in the Internet.  
Router

- iii. It is used to connect two LAN segments. It forwards complete and correct frames to the other segment. It does not forward any electrical interference signals to the other segment. Bridge

- iv. Network interface card (NIC) is a hardware device through which the computer connects to a network. [2 Marks]

(f) List the four factors that determine the speed of a wireless connection.

1. Type of Data Connection
2. Location
3. Coverage Area ~~or obstruction~~ free path
4. Interference and number of users using the network  
Line of Sight of transmission  
Distance of wireless clients device from access point

[4 Marks]

## QUESTION TWO (INTERNET BASICS)

(a) What do you call the collection of linked documents or pages, stored on millions of computers and distributed across the world? [2 Marks]

Whole World Wide Web (WWW)

(b) Each web page has a unique address, called a URL, that identifies its location on the Internet.

What does the acronym URL stand for? [1 Mark]

Uniform Resource Locator

(c) True/False. The format of a URL usually consists of four parts: The topology, domain name, path and filename. ~~WWW~~ protocol [1 Mark] ✓

(d) The domain name of every web address contains an extension that can tell you the nature of business associated with that website. Which extension.

- (i) Is used to signify a learning institution? .edu ✓
- (ii) Is used to signify a not-for-profit business? .net .org
- (iii) Is used to signify a branch of government? .govt .gov
- (iv) Is used to signify a commercial business entity? .com

[2 Marks]

(e) Before connecting to the Internet, you need to buy an Internet connection from an authorized Internet Service Provider (ISP). Name any four types of connections. [2 Marks]

- Integrated ~~Subscriber~~ Service Digital Network (ISDN)
- Digital ~~Subscriber~~ Line (DSL)
- Broadband
- Cable Modem

2

(f) Which feature of email is used to send one message to several addresses without showing everyone all the other recipients of the same message. [1 Mark]

1 Blind Carbon Copy (BCC)

(g) What is the unit of measurement for internet speed? [1 Mark]

Mega ~~Bytes~~ ~~Per second~~? Kilobits

(h) What is the complete name for a link you find on a website that is used to jump to another part of the same page or to load a different web page. [1 Mark]

~~Blank~~ Page hyperlink

### QUESTION THREE (SECURITY)

(a) Vulnerability is a weakness of system that is left unprotected. Such a system can suffer from two types of attacks. What are they? [2 Marks]

2 Passive And Active

(b) Security services provide specific kind of protection to system resources. What kind of security service prevents either sender or receiver from denying a transmitted message? [2 Marks]

2 Non-Repudiation

(c) Cryptography is the science of writing information in a "hidden" or "secret" form. It is made up of two processes: ~~Encryption~~ (which converts plain text to cypher text) and ~~Decryption~~ (which converts cypher text back to plain text). [2 Marks]

(d) There are three cryptographic schemes. From the three

(i) Which one uses a mathematical transformation to irreversibly convert plain text to cypher text? ~~Hash function~~

(ii) Which one is employed in Digital Signatures?

~~Public Cryptographic~~

[2 Marks]

(e) What do you call a security mechanism that is used to protect a local network from the threats it may face while interacting with other networks? ~~Firewall~~ [2 Marks]

- (1) True/False. Security awareness is a formal statement that embodies the organization's overall security expectations, goals, and objectives with regard to the organization's technology, system and information? False [2 Marks]

#### QUESTION FOUR (INFORMATION SYSTEMS)

(a) The main types of information systems used in organization are Office Automation Systems, Transaction processing system, management information system, decision support system and executive information system. State the kind of information system that would be used for the following tasks.

- Generate information related to the sales of a product in a month and the inventory status during that month.

Transaction Processing System

- Monitor the performance and maintain coordination between the different functional areas, like purchase and accounts payable, in an organization.

Management Information System

- Identify a problem, an opportunity, or a trend which affects the organization's future growth.

Executive Information System

- Provides support for the traditional office operations like managing the documents, sending messages for interaction, arranging and conducting meetings.

Decision Support System Office Automation System

- (b) The performance of Information System is measured by [2 Marks]

Efficiency

and

Effectiveness

[2 Marks]

- (c) List the three types of reports generated by a Management Information System (MIS).

Summary Report

Annual Report

1

detailed

exceptional

- (d) List three examples of specialized information systems. [3 Marks]

Enterprise Resource Planning

Expert System

Electronic Commerce (e-commerce)

[3 Marks]

- (c) List the parties that may be involved in e-commerce at any time. [2 Marks]

- ~~Consumers~~ and companies  
- Companies and companies  
Companies and consumer  
consumers and consumers  
Business and the public sector

#### QUESTION FIVE (PROGRAMMING)

- (a) In class, we learnt introduction to programming in C++. What is the name of the IDE that was used for practice? [1 Mark]

- (b) When writing a C++ program, there are different data types that can be used for variable declaration. Correctly spelt, list any 6. [3 Marks]

- strings - constants - floating values  
- ~~floats~~ - integers - functions  
- Boolean - characters

- (c) Carefully examine the following variable names. Which four are invalid names? (Just indicate the numbers. If you indicate more than four, your answer will be ignored!) [2 Marks]

- (i) my name  
(ii) myage  
(iii) mySalary\_  
(iv) my-height  
(v) namespace  
(vi) 2sizes  
(vii) Return  
(viii) my2friends

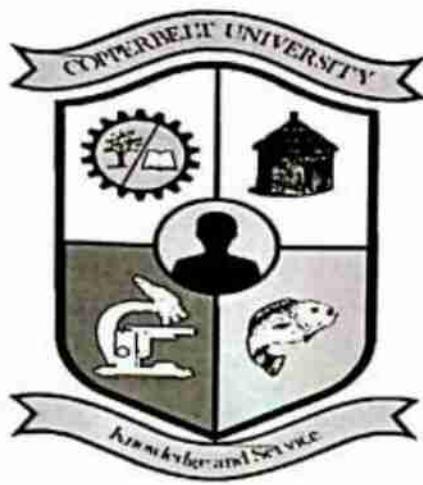
i, v, vii and viii

- (d) When you write a program, the errors you get when you compile a program are called what? [1 Mark]

- (e) When you write a program, the errors you get when the program is running are called what? [1 Mark]

- (f) The volume of a sphere can be computed using the formula  $V=(4/3)\pi r^3$  where  $\pi$  is the constant 3.142,  $r$  is the radius, and  $V$  is the volume. Write a program that can be used as a calculator for the volume of a sphere. [4 Marks]

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**THE COPPERBELT UNIVERSITY  
SCHOOL OF INFORMATION AND COMMUNICATION  
TECHNOLOGY  
COMPUTER SCIENCE DEPARTMENT**

**2017/2018 SESSIONAL EXAMINATIONS**

**CS 110 – INTRODUCTION TO COMPUTING**

**INSTRUCTIONS**

- ⊕ Time allowed is three (3) hours
- ⊕ There are six (6) questions in this paper. Four (4) in section A and Two (2) in section B.
- ⊕ Answer ALL questions in section A and ANY ONE (1) from section B.
- ⊕ Read the questions carefully before answering. Identify such words as State, List, and Outline etc, and proceed as appropriate. If the question asks for a given number of points, you risk losing marks by giving more than required of you.
- ⊕ All questions carry equal marks. Each Question is 12 Marks.

## SECTION A

### QUESTION ONE

- (a) Carefully consider the program given below. The program is supposed to be used to compute the Volume of a Cylinder. The program has 6 syntax errors that have been deliberately introduced. *Identify the error by indicating the line number on which the error is and rewrite the line correcting the error (DO NOT REWRITE THE FULL PROGRAM!). [6 Marks]*

```
1 #include<iostream>
2 #include<cmath>
3
4 using namespace dts;
5 int main()
6{    constant double PI=3.142;
7    double radius,height,volume;
8    cout<<"enter the value of Radius=";
9    cin>>radius;
10   cout<<"enter the value of Height=";
11   cin>>height;
12   volume=PI*radius*raduis*height;
13   cout<<"Volume = "<<volume;
14   Return 0;
15 }
```

- (b) When declaring a variable in C++, there are four rules that have to be followed to come up with a valid name. What are they? [2 Marks]

- (c) The list below show values to be stored in variables in a C++ program. Supply the appropriate data type for each one of the following names:

- (i) 2.34
- (ii) "F"
- (iii)'2'
- (iv)23E255
- (v) "false"
- (vi)200

[3 Marks]

- (d) What do you call errors that are generated by a program when the expected output is wrong? [1 Mark]

## QUESTION TWO

A computer is an electronic machine that accepts data from the user, processes the data by performing calculations and operations on it, and generates the desired output results. Computer performs both simple and complex operations, with speed and accuracy. In point form, assemble your own computer by answering the following questions:

- Other than monitor, RAM chip, processor chip and hard disk, list 6 distinct off-the-shelf hardware components that you can buy from a vendor to complete your computer. [3 Marks]
- In one line for each, give reasonable specifications you would go for when buying RAM (capacity), Processor (actual speed), and Hard Disk (capacity). [3 Marks] ✓
- The quality of the display on the monitor is often determined by the configuration of dots, also known as pixels. The clarity of image on the computer screen depends on three factors. What are they? [3 Marks]
- If the operating system on your computer (pretend you have one if you don't) is a Linux distribution, which version are you running? [1 Mark] ✓
- What is the name of the antivirus that comes pre-installed on current releases of Windows Operating Systems? [1 Mark] ✓

## QUESTION THREE

A computer consists of three main components—(1) Input/output (I/O) Unit, (2) Central Processing Unit (CPU), and (3) Memory Unit.

- State 6 important registers that are found in the Central Processing Unit [3 Marks] ✓
- A bus is a set of electronic signal pathways that allows information and signals to travel between components inside or outside of a computer. Data Bus is used to transfer data between I/O devices and CPU. What are the three most common bus technologies? [3 Marks] ✓
- In relation to computer buses, what does the acronym SATA (as in SATA cables) stand for? [2 Marks]
- There are a number of factors involved that are related to the CPU and have an effect on the overall speed and performance of the computer. State any four such factors. [4 Marks] ✓

## **QUESTION FOUR**

System software provides basic functionality to the computer. System software is required for the working of computer itself. On the basis of their functionality, system software may be broadly divided into two categories.

- a) What are the categories? [2 Marks]
- b) Give 3 examples of system utility software. [3 Marks] ✓

In addition to the categorization of programming languages into low and high level programming languages, they are also classified in terms of generations in which they have evolved. There are five generations starting from first generation going up to fifth generation.

- c) In which category does each one of the languages fall?
  - i. PROLOG
  - ii. C
  - iii. C++[3 Marks] ✓
- d) List any two (2) Suites of Software having Word Processor, Spreadsheet and Presentation Software. [2 Marks] ✓
- e) State any 4 different ways in which the software is made available to users. [2 Marks] ✓

(9)

## **SECTION B**

### **QUESTION FIVE**

Each of the following Statements has a blank space that can only accommodate one word. Fill in the blanks.

- a) As a type of Information Systems, EIS stands for \_\_\_\_\_ Information System.
- b) The science of writing information in a "hidden" or "secret" form and is an ancient art is called \_\_\_\_\_.
- c) \_\_\_\_\_ is defined as a weakness of system that is left unprotected.
- d) The components of a Computer Based Information System (CBIS) include hardware, software, \_\_\_\_\_, telecommunications, people, and procedures.
- e) Since \_\_\_\_\_ systems are integrated systems; they help to streamline different processes and workflows, allow data to be easily shared across various departments in an organization, improve the efficiency and productivity levels, and improves customer service.
- f) XML is an acronym for \_\_\_\_\_ Markup Language.
- g) Some of the most popular search engines are \_\_\_\_\_ (by Microsoft), [google.com](http://google.com) (by Google), and [yahoo.com](http://yahoo.com) (by Yahoo).
- \*h) An Information System consists of four main components—Input, Process, Output, and \_\_\_\_\_.
- i) Expert system is an applied area of Artificial Intelligence. An expert system is a knowledge-based system having two main components—knowledge base and \_\_\_\_\_.
- j) \_\_\_\_\_ is a basic level of activity that is performed during the business operations. It is the business-related exchange of payments to employees, sales to customers, and payments to suppliers.
- k) A program that traverses the Web from link to link, identifying and reading pages is called \_\_\_\_\_.
- l) \_\_\_\_\_ virus infects both boot sectors and executable files, and uses both mechanisms to spread.

[12 Marks]

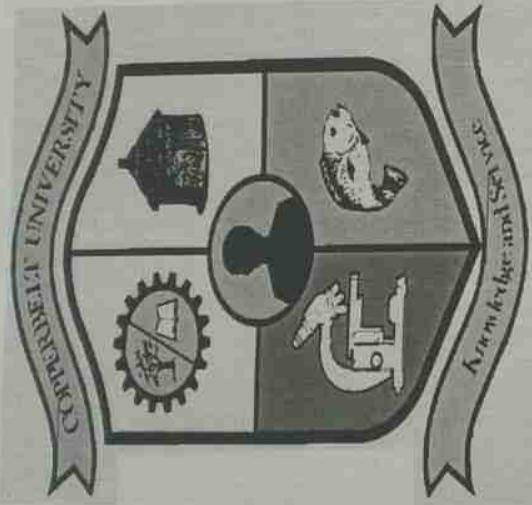
## QUESTION SIX

The term 'Internet' is derived from two words—interconnection and networks. Also referred to as 'the Net', Internet is a worldwide system of computer networks, that is, a network of networks, which allows the participants (users) to share information.

- a) Before connecting to the Internet, you need to buy an Internet connection from an authorized Internet Service Provider (ISP). The speed of accessing the Internet entirely depends upon the type of connection you bought from the ISP. Give four examples of internet connections. [2 Marks]
- b) To connect to the Internet, a computer requires mainly three (3) different kinds of software. What are they? [3 Marks]
- c) In relation to the Internet, what does the acronym HTTP stands for? [2 Marks]
- d) Write the complete URL for our university website. [2 Marks]
- e) There are many kinds of viruses. The level of destructiveness of viruses varies widely. Some viruses display pictures or messages on the screen periodically. Others erase or destroy programs and data. Which of the seven (7) categories of viruses we learnt in class is most likely to:
  - (i) Steal Credit card information stored on your computer [1 Mark]
  - (ii) Overload the network bringing about denial of Service [1 Mark]
- f) Is it possible to access Facebook on a mobile phone without being connected to an Internet Service? (Yes/No) [1 Mark]

## GOOD LUCK

*"Success is the preserve of those who are steadfast in their desire, for they become great- because when you follow your passion, success follows you"*



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2017 SESSIONAL EXAMINATIONS

CS 110 – INTRODUCTION TO COMPUTING

INSTRUCTIONS

- Φ Time allowed is three (3) hours
- Φ There are five (5) questions in this paper. Answer ANY four (4).
- Φ Read the questions carefully before answering. Identify words such as State, List, and Outline etc, and proceed as appropriate. If the question asks for a given number of points, you risk losing marks by supplying more than required of you.
- Φ Do not use acronyms or abbreviations.
- Φ All questions carry equal marks. Each Question is 15 Marks for a total of 60 Marks.

## QUESTION ONE

The communication process involves—sender of information, receiver of information, language used for communication, and medium used to establish the communication. Communication between computers also follows a similar process through computer networks.

- a) The data is sent from one computer to another over a transmission medium. The transmission media can be grouped into guided media, and unguided media. Give two (2) examples of:
  - (i) Guided media
  - (ii) Unguided Media

[2 Marks]

[2 Marks]
- b) LAN is a computer network widely used for local communication. It connects computers in a small area like a room, building, office or a campus spread up to a few kilometers.
  - (i) Name three (3) common LAN networking topologies.
  - (ii) For each one of the topologies you have named in (i), give one (1) example of the protocol employed (without repeating the protocols for different topologies).

[3 Marks]

[2 Marks]
- c) In relation to networks, what does the acronym Wi-Fi stand for?
- d) A concentrator is a device having two or more ports to which the computers and other devices can be connected. Give four (4) examples of concentrators.
- e) Imagine you have two standalone computers. You want to create a network between the two computers. So you obtain a network cable (RJ45) and directly connect the two computers through the network ports. What is such a LAN network called? [1 Mark]

## QUESTION TWO

The widespread use of computers has resulted in the emergence of a new area for security—security of computer. Computer security is needed to protect the computing system and to protect the data that they store and access.

- a) Name and briefly discuss the two (2) types of security attacks.
  - b) Hacking is the act of intruding into someone else's computer or network. Name three (3) methods that are used to get the username and password of the system to gain unauthorized access to the system.
  - c) Cryptography is the science of writing information in a "hidden" or "secret" form and is an ancient art. Cryptography is necessary when communicating data over any network, particularly the Internet. Name the three (3) cryptographic schemes.

[4 Marks]

[3 Marks]

[3 Marks]
  - d) Name six (6) services offered by a secure system.
  - e) [True/False] Digital signature scheme is a type of symmetric cryptography.
- [2 Mark]

### **QUESTION THREE**

The term 'Internet' is derived from two words—interconnection and networks. Also referred to as 'the Net', Internet is a worldwide system of computer networks, that is, a network of networks, which allows the participants (users) to share information.

- a) Before connecting to the Internet, you need to buy an Internet connection from an authorized Internet Service Provider (ISP). The speed of accessing the Internet entirely depends upon the type of connection you bought from the ISP. Give four examples of internet connections.  
[4 Marks]
- b) To connect to the Internet, a computer requires mainly three (3) different kinds of software. What are they?  
[3 Marks]
- c) In relation to the Internet, what does the acronym URL stand for?  
[2 Marks]
- d) Write the complete URL for our university website.  
[2 Marks]
- e) There are many kinds of viruses. The level of destructiveness of viruses varies widely. Some viruses display pictures or messages on the screen periodically. Others erase or destroy programs and data. Which of the seven (7) categories of viruses we learnt in class is most likely to:
  - (i) Steal Credit card information stored on your computer  
[1 Mark]
  - (ii) Overload the network bringing about denial of Service  
[1 Mark]
- f) Is it possible to access Facebook on a mobile phone without being connected to the Internet directly or indirectly? Explain.  
[2 Mark]

### **QUESTION FOUR**

Operating system is system software that controls and coordinates the use of hardware among the different application software and users. OS intermediates between the user of computer and the computer hardware. The user gives a command and the OS translates the command into a form that the machine can understand and execute.

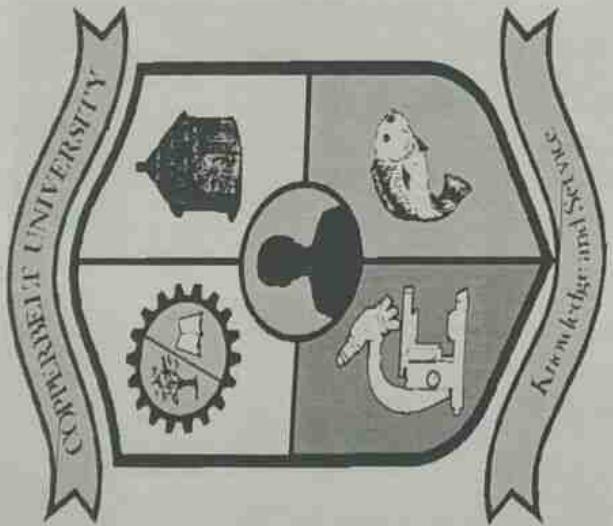
- a) Other than Process and Memory Management, what are the other functions performed by the Operating System?  
[4 Marks]
- b) There are many different CPU scheduling algorithms that are used to schedule the processes. In class, we talked about three. State and briefly describe each one of them.  
[6 Marks]
- c) What do you call a situation where multiple processes access and manipulate the same data concurrently, in which the final result depends on the order of process execution?  
[1 Marks]
- d) A deadlock arises when four necessary conditions hold true simultaneously in a system. Name the four conditions.  
[4 Marks]

## **QUESTION FIVE**

Write short notes on the following computing concepts.

[3 Marks Each]

- a) Disk Partitioning
- b) Virtual Memory
- c) The World Wide Web
- d) Process Synchronization
- e) Cloud Computing



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- Φ **Do not use acronyms or abbreviations.**
- Φ All questions carry equal marks. Each Question is 20 Marks for a total of 100 Marks.

## QUESTION ONE

(a) Answer the following Microsoft Excel Questions given below.

Figure 1 - Payroll for Bungwe Trump's company.

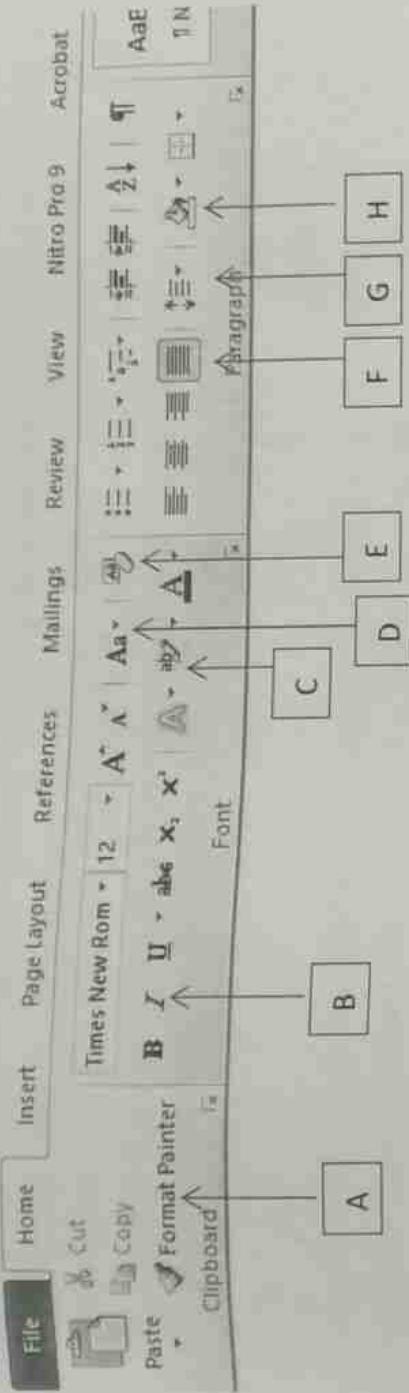
A	B	C	D	E	F	G
2	Total Sales	Base Salary	Commission	Total Salary	Commission Percentage	
3	Salesperson					
4	Adams, John	\$98,000	\$35,000			
5	Barber, Maryann	\$24,000	\$35,000			
6	Boone, Dan	\$39,000	\$50,000			
7	Borow, Jeff	\$56,000	\$35,000			
8	Smith, Adam	\$100,000	\$50,000			
9						
10	Average Total Salary					
11	Highest Total Salary					
12	Number of Employees					

- i. The commission an employee receives is 5% of their total sales. Write down the formula that can be used to calculate the Adams John's commission. (*You should use absolute referencing in specifying the commission percentage.*) [3 marks]
- ii. Total salary is calculated as the sum of the base salary and the commission. Write down the formula that can be used to determine Adams John's total salary. [2 marks]
- iii. Write down the formula using functions that can be used to calculate the Average total salary of the employees. [2 marks]
- iv. Write down the formula that counts all the employees whose total sales is more than \$50,000. (Use the COUNTIF function in your formula). [3 marks]
- v. Figure 2 shows the salesmen in Kitwe and Lusaka. Write down the function that can calculate the total sales (i.e. the grand total) that were made for both cities. [3 marks]

Figure 2 - Sales.

A	B	C	D
2	Lusaka Sales	Kitwe Sales	
3	Salesperson		
4	Adams	ZMK 98,000	ZMK 35,000
5	Barber	ZMK 24,000	ZMK 35,000
6	Boone	ZMK 39,000	ZMK 50,000
7	Borow	ZMK 56,000	ZMK 35,000
8	Smith	ZMK 10 000	ZMK 50,000
9			
10			
11			Total sales for both cities.
12			

(b) Answer the following Microsoft Work Question



From the image above, use the supplied labels to identify which icon is used for the following tasks.

- (i) Change text to italics
- (ii) Shade the text
- (iii) Change line spacing
- (iv) Clear text formatting
- (v) Copy text appearance from one place and apply it to another
- (vi) Justify text
- (vii) Change text casing

## QUESTION TWO

(a) The computer has evolved from a large-sized simple calculating machine to a smaller but much more powerful machine. The evolution of computer to the current state is defined in terms of the generations of computer. There are five (5) generations altogether starting with the first and ending with the fifth. Indicate these generations from the following technologies.

- (i) Computers used the Integrated Circuit
- (ii) The instructions were written using the assembly language
- (iii) Computers tried to simulate the human way of thinking and reasoning
- (iv) Computation time was in staggering milliseconds
- (v) Introduced the Graphical User Interface (GUI)

(b) The digital computers that are available nowadays vary in their sizes and types. The computers are broadly classified into four categories namely Microcomputers, Minicomputers, Mainframe computers, and Supercomputers. Identify the classes into which the following devices fall.

- (i) Apple iPhone
- (ii) Samsung Galaxy Tablet
- (iii) Lenovo Laptop
- (iv) Dell OptiPlex Desktop

[2 Marks]

(c) Registers are high-speed storage areas within the CPU, but have the least storage capacity.  
Registers are not referenced by their address, but are directly accessed and manipulated by the CPU during instruction execution. They store data, instructions, addresses and intermediate results of processing. Which Register :

- (i) Contains the address of next instruction to be processed?
- (ii) Stores the result of arithmetic and logic operations?
- (iii) Temporarily stores data from memory or the data to be sent to memory

[3 Marks]

(d) The Motherboard has a certain number of input/output sockets that are connected to the ports and interfaces found on the rear side of a computer. You can connect external devices to the ports and interfaces, which get connected to the computer's motherboard. Write the full names of the following connections that can be found at the back of the computer.

- (i) USB
- (ii) SCSI
- (iii) VGA

[6 Marks]

(e) If Kilimanjaro Banda is talking about how amazing the Intel Core i7 of his laptop is, which component of his laptop is he referring to?  
[2 Marks]

(f) True/False. The size of the monitor affects the performance of a computer. [2 Marks]

### QUESTION THREE

*The computer's memory stores data, instructions required during the processing of data, and output results. Storage may be required for a limited period of time, instantly, or, for an extended period of time.*

- (a) Name the two categories of Primary Memory and, for each category, list two subcategories.  
[6 Marks]
- (b) Flash Memory is a kind of semiconductor-based non-volatile, rewritable computer memory that can be electrically erased and reprogrammed. It is a specific type of what subcategory memory from (a)?  
[1 Mark]
- (c) Answer the following questions on DVDs.
  - (i) What does the acronym DVD stand for?
  - (ii) What is the capacity of a common DVD?
- (iii) What category of secondary memory does a DVD fall under?  
[3 Marks]
- (d) True/False. There are some types of Compact Discs that that can be erased and rewritten to?  
[1 Mark]

*A computer interacts with the external environment via the input-output (I/O) devices attached to it. Input device is used for providing data and instructions to the computer. After processing the input data, computer provides output to the user via the output device.*

- (e) Optical input devices allow computers to use light as a source of input. Scanner is an example of optical input device. Give three more examples of optical input devices.
- [6 Marks]
- (f) The print quality (sharpness and clarity of print) of a given printer is determined by its resolution. Printer resolution is measured in dpi. What does dpi stand for? [1 Mark]
- (g) An image on the monitor is created by a configuration of dots known as what? [2 Marks]

#### QUESTION FOUR

*Software tells the computer how the tasks are to be performed; hardware carries out these tasks. Different sets of software can be loaded on the same hardware to perform different kinds of tasks.*

- (a) Name any four (4) High Level Programming Languages. [2 Marks]
- (b) Carefully examine the source code below. What programming language is it written in?
- ```
ADD 2, 3  
LOAD A  
SUB A, B
```
- [2 Marks]
- (c) As a form of software Acquisition, what does OEM stand for? [2 Marks]

*Operating system is large and complex software consisting of several components. Each component of the operating system has its own set of defined inputs and outputs. Different components of OS perform specific tasks to provide the overall functionality of the operating system.*

- (d) Other than Process Management, list three other main functions of the operating system. [3 Marks]
- (e) Answer the following questions as they apply to Process Management.
- (i) True/False. A program is a process in a state of execution. It is a unit of work for the operating system. [1 Mark]
- (ii) Give three (3) examples of Central Processing Unit Scheduling Algorithms. [3 Marks]
- (iii) What do you call a situation where multiple processes access and manipulate the same data concurrently, in which the final result depends on the order of process execution? [2 Marks]
- (iv) A deadlock arises when the four necessary conditions hold true simultaneously in a system. Name the four conditions. [4 Marks]
- (f) True/False. It is possible for a computer to run out of Virtual Memory. [1 Mark]

#### QUESTION FIVE

*A computer network is an interconnection of two or more computers that are able to exchange information. Networking of computers provides a communication link between the users, and provides access to information.*

- (a) Optical fibers are being used for transmission of information over large distances more cost-effectively than the copper wire connection. Draw and, clearly label, the cross section area of a fiber optic cable.
- [3 Marks]
- (b) Name the types into which Computer networks are broadly classified.
- [3 Marks]
- (c) There are different types of network topologies that are used in a network. Name the three network topologies discussed in the course.
- [3 Marks]
- (d) The cables are used to transmit data in the form of signals from one computer to another. But cables cannot transmit signals beyond a particular distance. Concentrators are used. Which concentrator

- (i) Is a device through which the computer connects to a network?
- (ii) Is used to interconnect the networks in the Internet.
- (iii) Has a simulated network environment for each computer connected to it?
- (iv) Connects networks that use different technologies, different media, and physical addressing schemes or frame formats.

*The purpose of computer security is to provide reliable security services in the environments suffering security attacks, by using security mechanisms. The security services use one or more security mechanism(s).*

- (e) Name six (6) services offered by a secure system.
- [3 Marks]
- (f) Cryptography is the science of writing information in a “hidden” or “secret” form and is an ancient art. Cryptography is necessary when communicating data over any network, particularly the Internet. Name the three cryptographic schemes that are used for the encryption of data.
- [3 Marks]
- (g) \_\_\_\_\_ includes people, procedures, hardware, software, data, and knowledge needed to develop computer that display the characteristics of intelligence.
- [1 Mark]

## QUESTION SIX

*The word multimedia consists of two words—multi and media. The word multi means many and the word media (plural of medium) are the means through which information is shared.*

- (a) What do you call the number of pixels in the digital image relative to the physical size of the original material?
- [2 Marks]
- (b) Text is an important element of multimedia. The purpose of using text is to write titles, to define menus, to navigate, and to write the content. Text is written in a font. What three things makeup a font?
- [3 Marks]
- (c) Define the terms Rendering, Looping, and Morphing as they relate to animation.
- [6 Marks]
- (d) Clearly explain HSL as a color model. In your explanation, indicate what the acronym HSL stand for and describe the implication of each letter.
- [5 Marks]
- (e) Define Image Compression. In your definition, identify image properties that are exploited when compressing images. Also, list two image compression Algorithms.
- [4 Marks]

17 R

### COPPERBELT UNIVERSITY

### SCHOOL OF MATHEMATICS AND NATURAL SCIENCES INTRODUCTION TO COMPUTING (CS 110) TEST ONE

#### INSTRUCTIONS

*Answer all questions in the space provided. Total Mark is 50. Marks are indicated beside each question. Time allowed is 1 hour 30 minutes. No calculators or cell phones should be used in this test.*

#### PERSONAL DETAILS

GROUP: \_\_\_\_\_ NAME: \_\_\_\_\_

SID: \_\_\_\_\_

#### QUESTION ONE (Circle the correct answer from the choices provided in each question)

1) Which of the following statements is TRUE?

- (a) ROM loses information when the computer is powered off. (b) ROM chips can be plugged into the motherboard to provide more memory. (c) ROM can't be written to, it's preprogrammed.

2) Which of the following requires power to be on in order to maintain the data it stores?

- (a) ROM (b) RAM (c) Hard disk (d) Flash drive

3) What is the name of the terminal, with limited processing capabilities, which is usually connected to a mainframe computer?

- (a) A dumb terminal (b) An intelligent terminal (c) A terminal adapter (d) A terminal node.

4) Which of these statements about computer applications is true?

- (a) The same version of an application will work on any type of computer. (b) They control devices such as printers and scanners that are attached to the PC. (c) They enable users to carry out specific task such as word processing. (d) They are the only programs that you need to use a PC.

5) What type of non-volatile memory would most likely store firmware like a computer's BIOS?

- (a) EEPROM (b) Hard Disk (c) Tape Drive (d) Flash Drive

**QUESTION TWO (State whether each of the following statements is true or false)**

- 1) Static RAM chips require continuous refreshing for them to store data.
- 2) Flash memory is used in MP3 players because they are high-speed memories, durable and have low-energy consumption.
- 3) The content of Programmable ROM can be changed by applying high voltages to them.
- 4) Memory buffer registers temporarily store data to be sent to memory.
- 5) The Logic Unit is performs comparisons of operands.
- 6) The instruction cycle has only three (3) steps; namely Fetching, Decoding and Executing.
- 7) The expansion bus in the computer is made up of two (2) kinds of buses; namely, the data bus and the address bus.
- 8) Input devices that require data to be entered manually to the computer are identified as human data entry devices.
- 9) Peripheral devices connected via USB ports do not require device drivers installed on the computer.
- 10) A program written in a second generation language uses symbolic representation called mnemonics.
- 11) System profiling utility is used to divide a single drive into multiple logical drives.
- 12) Disk cleaners are used to find viruses on flash drives connected to the computer.
- 13) The loader software is used to load and re-locate the executable program in the main memory.
- 14) Compiler converts the entire source code into object-code and creates the executable code.
- 15) Shareware is a program that is free for personal use.

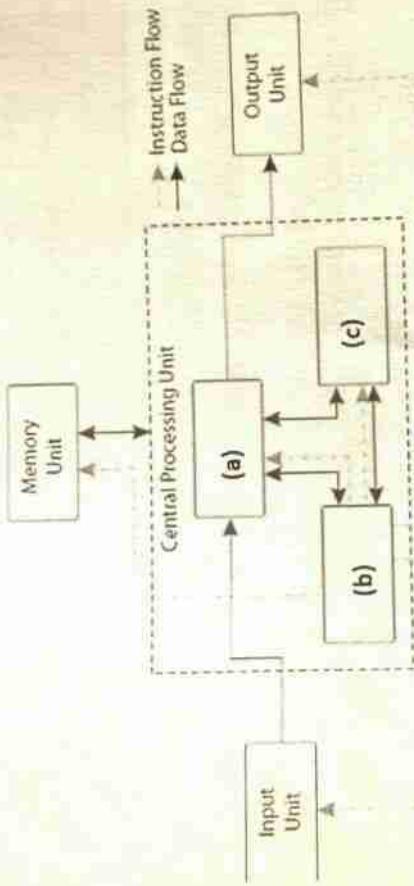
**QUESTION THREE**

- a) State the I/O port that can be used for the following:
  - i. Provide the plug and play features so that devices can be connected to the computer without having to re-boot it.
  - ii. Connect a DVD drive to the computer.

[4 marks]

- iii. Transmit data, one bit at a time.
- iv. Transmit eight bits of data simultaneously.

- b) Carefully examine the following diagram that is supposed to show the different components that make up the central processing unit of the computer.



From the three (3) components a, b, and c shown above, state the component that performs the following functions:

- i. Holds the CPU's instruction set, which is a list of all operations that CPU can perform.
- ii. Temporarily store data to be sent to memory
- iii. Perform logical operations.
- iv. Keep track of the program instruction to execute next
- v. Coordinate input and output activities of a computer.

- c) State the two (2) factors that affect the performance of RAM. [2 marks]

1. \_\_\_\_\_
  2. \_\_\_\_\_
- d) For each of the following, write the system utility responsible for the given task. [4 marks]
- i. Divide a single drive into multiple logical drives \_\_\_\_\_
  - ii. Provides detailed information about the software installed on the computer and the hardware attached to it \_\_\_\_\_
  - iii. Encrypt and decrypt files \_\_\_\_\_

iv. Check the computer network and log events

**QUESTION FOUR**

- a) Different kinds of software are made available for use to users in different ways. Name any six such ways.

[1] \_\_\_\_\_  
[2] \_\_\_\_\_  
[3] \_\_\_\_\_  
[4] \_\_\_\_\_  
[5] \_\_\_\_\_  
[6] \_\_\_\_\_

- b) Outline three basic functions of the operating system

[1] \_\_\_\_\_  
[2] \_\_\_\_\_  
[3] \_\_\_\_\_

- c) Convert D3B<sub>16</sub> directly to binary. (show your working)

[3 marks]

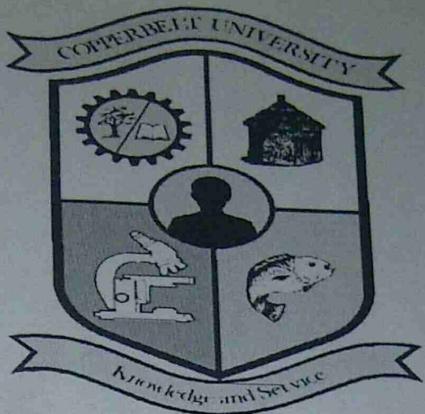
- d) Convert 29.48<sub>16</sub> to decimal. (show your working)

[2 marks]

- b) The number -313 is to be stored in a 16-bit memory location. Show how this number will be stored.  
[2 marks]

- d) The table below shows the generations of programming languages. Give one example of the programming language for each generation. The first generation has already been filled in for you.  
[2 marks]

| First Generation  | Machine language |
|-------------------|------------------|
| Second Generation |                  |
| Third Generation  |                  |
| Fourth Generation |                  |
| Fifth Generation  |                  |



**THE COPPERBELT UNIVERSITY  
SCHOOL OF MATHEMATICS AND NATURAL SCIENCES  
COMPUTER SCIENCE DEPARTMENT**

**JUNE 2016 SESSIONAL EXAMINATIONS**

**CS 110 – INTRODUCTION TO COMPUTING**

**INSTRUCTIONS**

- ⊕ Time allowed is three (3) hours
- ⊕ There are SIX (6) questions in this paper. **ANSWER ANY FIVE(5) QUESTIONS.**
- ⊕ Read the questions carefully before answering. Identify words such as State, List, and Outline etc, and proceed as appropriate. If the question asks for a given number of points, you risk losing marks by supplying more than required of you.
- ⊕ **DO NOT** use acronyms or abbreviations.
- ⊕ All questions carry equal marks. Each Question is 20 Marks for a total of 100 Marks.

## QUESTION ONE

Man developed computers so that it could perform intricate operations such as calculation and data processing or entertain him. Today, computers are everywhere—in our offices, homes, appliances and automobiles—the list is endless. Much of the world's infrastructure runs on computers, and the computers have profoundly changed our lives, mostly for the better.

- (a) State any four characteristics of computers [4 Marks]

- (b) The history of computer development is often discussed with reference to different generations of computing devices. There are five generations discussed in the course. Name the technologies associated with the first four generations in chronological order.

Thermionic Valve

Transistor

Computers can be classified according to purpose, data-handling and, according to functionality. List classes of computers according to:

Integrated Circuit data-handling

(ii) functionality

Very Large Scale Integration Tech

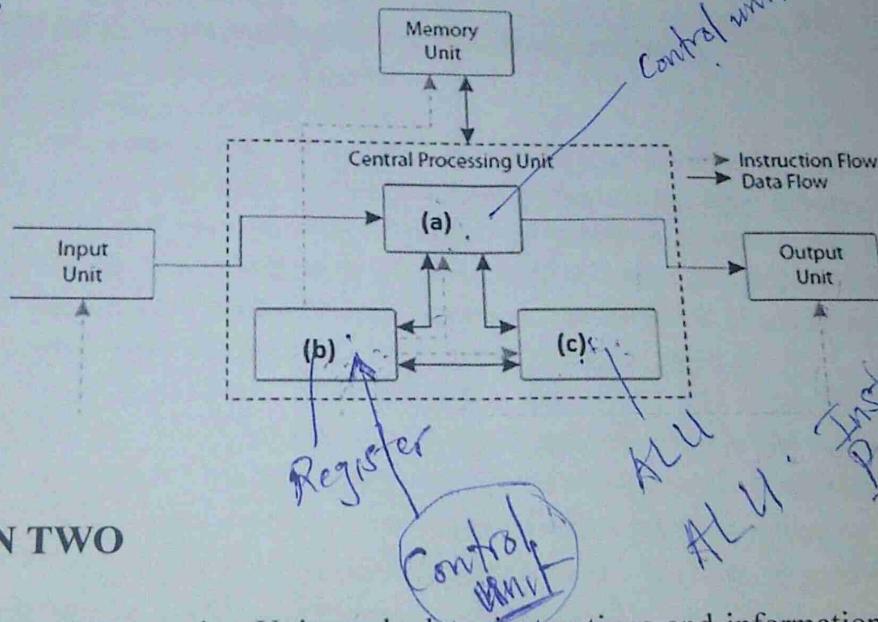
Super Computer

Super LSI

A computer can be viewed as a system, which consists of a number of interrelated components that work together with the aim of converting data into information. Name the four parts that make up a computer system.

[2 Marks]

- (e) Carefully examine the following diagram that is supposed to show the different components that make up the central processing unit of the computer. Which components are represented by a, b, and c? [3 Marks]



## QUESTION TWO

- (a) The Central Processing Unit sends data, instructions and information to the components inside the computer as well as to the peripherals and devices attached to it. For this purpose, buses are used. Name the three buses that make up the system bus. [3 Marks]
- (b) The primary responsibility of a computer processor is to execute a sequential set of instructions that constitute a program. CPU executes each instruction in a series of steps, called instruction cycle. List the steps that make up the instruction cycle. [2 Marks]

- (c) There are a number of factors involved that are related to the CPU and have an effect on the overall speed and performance of the computer. Other than the processor, name any 4 of such. [4 Marks] ✓
- (d) The processor or the CPU is the main component of the computer. Processors are selected based on factors like its speed, performance, reliability and motherboard support. [3 Marks] ✓
- (e) (i) What is the unit of measurement for the processor's speed? [1 Mark] ✓
- (ii) Give an example of processor speed which you think is reasonable to today's standards. 4 MHz [1 Mark]
- The computer's memory stores data, instructions required during the processing of data, and output results. Storage may be required for a limited period of time, instantly, or, for an extended period of time.
- (i) What are the different types of volatile primary memory? [2 Marks] ✓
- (ii) What are the different types of non volatile primary memory? [3 Marks] ✓
- (iii) In class, we talked about two types of storage devices that fall under secondary memory: Magnetic storage and Optical storage. Of the two, under which category does the Digital Versatile Disk and Hard Disks respectively fall? [2 Marks] ✓
- (iv) Name 2 methods that are used to access information stored in storage devices. [2 Marks] ✓

### QUESTION THREE

A computer interacts with the external environment via the input-output (I/O) devices attached to it. Input device is used for providing data and instructions to the computer. After processing the input data, computer provides output to the user via the output device.

Mark Optical Recognition

OCR MICR

Cache  
Clock  
RAM  
Data bus

MCR

(a) Name the two classes of input devices. [2 Marks] ✓

(b) Name the two classes of output devices. [2 Marks] ✓

(c) Optical input devices allow computers to use light as a source of input. Scanner is an example of optical input device. Name the four other optical input devices. [4 Marks] ✓

(d) The peripheral devices can be connected to computer in several ways. Devices such as network adapters and sound cards are connected to expansion slots inside the computer. Printers and scanners are connected to ports on the backside of the computer. Name any three ports that you can find at the back of a desktop computer. [3 Marks] ✓

Video Graphic Adapter? Parallel Port? AGP VGA Serial

The software that a user uses for accomplishing a specific task is the application software.

Application software may be a single program or a set of programs. A set of programs that are written for a specific purpose and provide the required functionality is called software package.

(e) Name the application software inside Microsoft Office that can be used for -

\* (i) creating a stock database — Excel ✓

(ii) writing an assignment

(iii) designing a Christmas cards

(iv) solving mathematical problems

\* (v) emailing — OneNote / word ✓

(vi) making a presentation

[6 Marks] ✓

(f) Different kinds of software are made available for use to users in different ways. Name any six such ways. [3 Marks] ✓

#### QUESTION FOUR

Operating System (OS) is an important part of a computer. OS intermediates between the user of a computer and the computer hardware. Different kinds of application software use specific hardware resources of a computer like CPU, I/O devices and memory, as needed by the application software.

Mac OS X

PF MIDS

- (a) List any three families of Operating Systems commonly used on desktop/laptop computers. [3 Marks] ✓

- (b) Name four families of mobile operating systems that are predominant today. [2 Marks] ✓

Operating system is large and complex software consisting of several components. Each component of the operating system has its own set of defined inputs and outputs. Different components of OS perform specific tasks to provide the overall functionality of the operating system. Name any four functions of the Operating System. [2 Marks]

There are many different CPU scheduling algorithms that are used to schedule the processes. Name the three that were discussed in the course. [3 Marks]

Apple

Apple iOS

Networking of computers provides a communication link between the users, and provides access to information. Networking of computers has several uses such as communication, resource sharing, and information sharing.

- (d) (e) Name the types into which Computer networks are broadly classified. [3 Marks] ✓

- (f) There are different types of network topologies that are used in a network. The network topologies differ in the structure or the layout of the different devices and computers connected to the network. Name the three network topologies discussed in the course. [3 Marks]

LAN  
MAN  
WAN

(g) The cables are used to transmit data in the form of signals from one computer to another. But cables cannot transmit signals beyond a particular distance. Moreover there is a need to connect multiple computers and devices. A concentrator is a device having two or more ports to which the computers and other devices can be connected. Which concentrator

- (i) Is a device through which the computer connects to a network? *gate* ✓  
(ii) Is used to interconnect the networks in the Internet. *Router* ✓  
(iii) Has a simulated network environment for each computer connected to it? *bridge* ✓  
(iv) Connects networks that use different technologies, different media, and physical addressing schemes or frame formats. *hub* ✓ [2 Marks]

(h) Which of the following wireless transmission technologies are not line-of-sight?

- Radio Frequencies
- Microwave Frequencies
- Infrared Transmission
- Bluetooth Transmission

[2 Marks] ✓

Gateway  
Bridge  
Router  
switch

" " " "  
20x 28x 14  
48x 48x  
8x 12x

## QUESTION FIVE ✓

The purpose of computer security is to provide reliable security services in the environments suffering security attacks, by using security mechanisms. The security services use one or more security mechanism(s).

- (a) Name six (6) services offered by a secure system. [3 Marks]
- (b) Hacking is the act of intruding into someone else's computer or network. To gain access, a hacker may steal the user's username and password. Name three mechanisms that a hacker may use to get the username and password of the system. [3 Marks]
- (c) Cryptography is the science of writing information in a "hidden" or "secret" form and is an ancient art. Cryptography is necessary when communicating data over any network, particularly the Internet. Name the three cryptographic schemes that are used for the encryption of data. [3 Marks]
- (d) Of the three schemes you have named above, which one
  - i. Uses a mathematical transformation to irreversibly encrypt information. [2 Marks]
  - ii. Is used in digital signatures

Information systems are vital for the functioning of businesses and organizations. Information Systems that are uses computers are called Computer-Based Information System (CBIS). They use computer and telecommunication technology for the generation of information.

- (e) Outline any six (6) characteristics of an information system. [3 Marks]
- (f) List the components that make up a Computer Based Information System. [3 Marks]
- (g) Give two examples of
  - (i) Operation Support Systems
  - (ii) Management Support Systems
  - (iii) Specialized Information Systems

## QUESTION SIX

Write short notes of less than half a page each on the following topics:

- (a) The role of a security plan in an organization [4 Marks]
- (b) How search engines operate [4 Marks]
- (c) How the Operating System manages processes [4 Marks]
- (d) The need for Efficient Information Systems [4 Marks]
- (e) How Artificial Intelligence is shaping today's computer technology. [4 Marks]

# COPPERBELT UNIVERSITY

## SCHOOL OF MATHEMATICS AND NATURAL SCIENCES INTRODUCTION TO COMPUTING (CS 110) TEST ONE

### INSTRUCTIONS

Answer all questions in the space provided. Total Mark is 60. Marks are indicated beside each question. Time allowed is 1 hour 30 minutes. No calculators or cell phones should be used in this test. DO NOT USE ACRONYMS/ABBREVIATIONS IN ANSWERING THE QUESTIONS.

### PERSONAL DETAILS

GROUP: C NAME: John Mull SID: 1101111111111111

### QUESTION ONE

(a) The history of computer development is often discussed with reference to different generations of computing devices. In computer terminology, the word 'generation' is described as a stage of technological development or innovation. Carefully examine the properties listed below and identify which generation they fall under. [2 Marks]

(i) They are the first to introduce graphical user interfaces

→ 4th Generation Computers

(ii) They use magnetic drums for memory.

→ First Generation Computers

(iii) They have multiple processors and perform parallel processing.

→ Sixth Generation Computers

(iv) They are based on integrated circuit technology.

2

Third Generation Computers

(b) Different types of computers process the data in different manner. According to the basic data-handling techniques, computers can be classified into three categories. What are they?

① mini computers → Hybrid [3 Marks]

② micro computers → Analog

③ Super computers → Digital

(c) The processor or the CPU is the main component of the computer. List four factors that should be considered when selecting the processor for your computer. [2 Marks]

① Its clock speed → ③ Size of the processor.

② Number of registers → ④ Type of processor (pentium number).

(d) True/False. Processor speed is measured in bytes. [1 Mark]

False

11

$$\begin{array}{r} 96 \\ 160 \\ \hline 256 \end{array}$$

$$\begin{array}{r} 1280 \\ 222 \\ \hline 1502 \end{array}$$

$$\begin{array}{r} 222 \end{array}$$

## QUESTION TWO

The computer's memory stores data, instructions required during the processing of data, and output results. Storage may be required for a limited period of time, instantly, or, for an extended period of time.

(a) The memory is characterized on the basis of two key factors. What are two key factors? [2 Marks]

- ① Volatile
- ② non volatile

(b) Memory is organized as either Primary or Secondary memory. Give three (3) examples of volatile primary memory. [3 Marks]

- ① RAM
- ② Cache memory
- ③ Registers

3

(c) ROM is a non-volatile primary memory. It does not lose its content when the power is switched off. Under what category of ROM does Flash Memory fall? [1 Mark]

→ ~~Static ROM~~ ~~→ CMOS~~

(d) Hexadecimal numbering if used for Memory Addressing on computers. If the address of an item in memory is  $0x5DE$  (that is  $5DE_{16}$ ), what would the address read in Decimal? Show your working. [3 Marks]

$$\begin{array}{ccc} \text{place value} & S^2 & D^1 & E^0 \\ & 16^2 & 16^1 & 16^0 \end{array}$$

$$(5 \times 16^2) + (13 \times 16^1) + (14 \times 16^0)$$

$$(5 \times 256) + (208 + 14)$$

$$1280 + 222$$

$$\Rightarrow \underline{\underline{1502}} \quad \checkmark$$

3

- (e) If the data to be stored at the address indicated in (d) above is 1001, what is the data to be stored, represented as a 16 bit binary number? Show your working. [3 Marks]

1 0 0 1

$$\begin{array}{cccc}
 & 1 & 0 & 0 & 1 \\
 & 2^3 & 2^2 & 2^1 & 2^0 \\
 (1 \times 8) & (4 \times 0) & (2 \times 0) & (1 \times 1) \\
 8 + 0 + 0 + 1 \\
 \Rightarrow 9_{16}
 \end{array}$$

- (f) Hexadecimal and Octal Systems are used to represent colors. If the color is written as BEEF<sub>16</sub>. How many bits make up that color? Also, how can that color be written in Octal? Show your working. [3 Marks]

① BEEF

B E E F  
 1 0 1 1 1 1 0 1 1 1 0 1 1 1 1

$$\begin{array}{c}
 \textcircled{1} \quad 101111011101111 \\
 | \\
 \begin{array}{r}
 2 \mid 15 \quad R \\
 2 \quad 7 \quad 1 \\
 2 \quad 3 \quad 1 \\
 2 \quad 1 \quad 1 \\
 0 \quad 1
 \end{array} \\
 | \\
 \begin{array}{r}
 2^0 \quad 2^1 \quad 2^2 \quad 2^3 \quad 2^4 \quad 2^5 \quad 2^6 \quad 2^7 \quad 2^8 \\
 0+1 \quad 2+1 \quad 4+2+1 \quad 8+1 \quad 16+1 \quad 32+1 \quad 64+1 \quad 128+1
 \end{array} \\
 | \\
 \begin{array}{r}
 1 \quad 3 \quad 7 \quad 3 \quad 5 \quad 7
 \end{array}
 \end{array}$$

$\Rightarrow 101111011101111_2$

$\Rightarrow 137357_8$

$$\begin{array}{r}
 2 \mid 11 \quad R \\
 2 \quad 5 \quad 1 \\
 2 \quad 2 \quad 1 \\
 2 \quad 1 \quad 0 \\
 0 \quad 1
 \end{array}$$

### QUESTION THREE

(a) A process is a program in a state of execution. It is a unit of work for the operating system. A process changes its state as it is executed. List any 4 possible states that a process can be into?

[2 Marks]

- ① Fetch
- ② Execute
- ③ Decode
- ④ Store

(b) Scheduler is a component of the operating system that is responsible for scheduling transition of processes. There are many different CPU scheduling algorithms that are used to schedule the processes. From the ones discussed in class, which scheduling algorithm:

- (i) Will likely lead to starvation? [1 Mark]

dead lock

- (ii) Does not support non pre-emptive scheduling? [1 Mark]

→ Short Job First

(c) What do you call the technique that allows processes to communicate with one another to prevent a situation where one process disrupts another process? [2 Marks]

→ Robin Round

(d) When two or more processes execute at the same time, independent of each other, they are called Concurrent processes [2 Marks]

2

(e) Kernel memory allows the execution of those processes that are not completely in memory. When a process executes and a page is required, that page is swapped-in into the memory. This allows execution of large-sized programs without loading them completely into the memory. [2 Marks]

(f) A File is a collection of related information stored on a secondary storage. The file profiling utility refers to the two, three or four letters at the end of the file name that can be used to identify what type of file it is and what program can open it.

[1 Mark]

## QUESTION FOUR

- (a) Software is a set of programs that instructs the computer about the tasks to be performed. Software tells the computer how the tasks are to be performed; hardware carries out these tasks. The table below shows different categories of software. Fill the table with examples of software released under the open source license (i.e. Open Source Software). [3 Marks]

| SOFTWARE TYPE    | EXAMPLE SOFTWARE |
|------------------|------------------|
| Operating System | Windows 7 ✓      |
| Office Suite     | Microsoft word ✓ |
| Web browser      | Opera mini ✓     |

- (b) A Programming Language consists of a set of vocabulary and grammatical rules, to express the computations and tasks that the computer has to perform. Give two examples of High Level Programming Languages. [2 Marks]

① JAVA ✓ ② .NET ✓

①

- (c) Translator software is used to convert a program written in high-level language and assembly language to a form that the computer can understand. Give three examples of Translator Software. [3 Marks]

- Compiler ✓ - Interpreter ✓

②

- (d) The choice of programming language for writing a program depends on the functionality required from the program and the kind of program to be written. What two programming languages are you likely to use if you are developing an expert system? [2 Marks]

① High level language (Lisp) ✓  
② Fortran ✓

②

## QUESTION FIVE

A computer interacts with the external environment via the input-output (I/O) devices attached to it. Input device is used for providing data and instructions to the computer. After processing the input data, computer provides output to the user via the output device.

- (a) What are the two classes of input devices?

[2 Marks]

→ Perched-in, Keyboards

→ Touch Screen ✓

- (b) Keyboard is a common input device. It is provided along with the computer, and is easy to use. It is used for entering the text data. Standard Keyboards are called Common keyboards.

[2 Marks]

(c) How many function keys (those prefixed with F) are you likely to find on a keyboard you have mentioned in (b) above? 12 [1 Mark]

1  
1

(d) What are the two classes of output devices? For each class, give two examples (excluding Monitor). [3 Marks]

- ① Printer, Fax machine (Graphical user interface)  
② Speakers, Projector.

1  
1

(e) Monitor is a common output device. The monitor is provided along with the computer, to view the displayed output. On the specification of a monitor, what do the following measurement units represent? [4 Marks]

(i) 1024x768 Screen resolution

1

(ii) 16:9 View Screen ratio

(iii) 72dpi Number of color Pixels

(iv) 60Hz The frequency

(f) The I/O ports are the external interfaces that are used to connect input and output devices like printer, modem and joystick to the computer. What do the following I/O acronyms stand for? [4 Marks]

(i) HDMI  $\Rightarrow$  High Definition ~~Media~~ Interface.

(ii) SCSI  $\Rightarrow$  Standard ~~Component~~ Serial Interface

(iii) VGA  $\Rightarrow$  Virtual Graphical Accelerator

2

(iv) USB  $\Rightarrow$  Universal ~~Serial~~ Bus

**COPPERBELT UNIVERSITY**  
**COMPUTER SCIENCE DEPARTMENT**  
**INTRODUCTION TO COMPUTING (CS 110)**

**TEST 1 (JULY, 2014)**

**INSTRUCTIONS**

**Answer all questions in the space provided – No back page will be checked. All marks add up to 100. Marks are indicated beside each question. Time allowed is 90 minutes. DO NOT USE ACRONYMS when answering questions.**

**PERSONAL DETAILS**

**GROUP:** \_\_\_\_\_ **NAME:** \_\_\_\_\_ **SID:** \_\_\_\_\_

**QUESTION ONE [40 Marks]**

- a) The computer has evolved from a large-sized simple calculating machine to a smaller but much more powerful machine. The evolution of computer to the current state is defined in terms of the generations of computer. State the major feature used in each one of the four generations: [8 Marks]
- (i) First Generation: Using \_\_\_\_\_
- (ii) Second Generation: Using \_\_\_\_\_
- (iii) Third Generation: Using \_\_\_\_\_
- (iv) Fourth Generation: Using \_\_\_\_\_
- b) The fifth generation of computers uses Artificial Intelligence. Artificial Intelligence includes areas like \_\_\_\_\_,  
\_\_\_\_\_,  
\_\_\_\_\_, and  
\_\_\_\_\_, etc. [4 Marks]

- c) Microcomputers are small, low-cost and single-user digital computer. They consist of CPU, input unit, output unit, storage unit and the software. List 6 types of computers that fall under microcomputer. [6 Marks]
- d) Computer is an electronic device that accepts data as input, processes the input data by performing mathematical and logical operations on it, and gives the desired output. The computer system consists of four parts. What are they? [4 Marks]
- e) List 7 components (Excluding Monitor, Mouse and Keyboard) that you can buy from a shop to build your own desktop computer (without which the computer cannot work).  
[14 Marks]
- f) If you decide to just buy a brand new laptop computer, state any four brands that you can consider. [4 Marks]

**QUESTION TWO [20 Marks]**

- a) Registers are high-speed storage areas within the CPU, but have the least storage capacity. Registers are not referenced by their address, but are directly accessed and manipulated by the CPU during instruction execution. List six important registers that can be found inside the CPU. [6 Marks]
- b) There are a number of factors involved that are related to the CPU and have an effect on the overall speed and performance of the computer. Other than registers, what are the other four? [4 Marks]
- c) In relation to expansion slots that can be found inside the computer, what do the following acronyms stand for: [6 Marks]
- (i) ISA \_\_\_\_\_
- (ii) PCI \_\_\_\_\_
- (iii) AGP \_\_\_\_\_
- d) The primary responsibility of a computer processor is to execute a sequential set of instructions that constitute a program. State four different categories in which an instruction can fall. [4 Marks]

**QUESTION THREE** [20 Marks]

- a) The computer memory stores different kinds of data like input data, output data, intermediate results, etc., and the instructions. The memory is characterized on the basis of two key factors. What are they? [4 Marks]
- 
- b) The internal memory and external memory are the two broad categories of memory used in the computer. The internal memory is used by the CPU to perform the computing tasks. List the four key features of internal memory. [4 Marks]
- c) The memory chips are available on a separate Printed Circuit Board (PCB) that is plugged into a special connector on the motherboard. Memory chips are generally available as part of a card called a memory module. There are generally two types of RAM modules. Name them. [4 Marks]
- d) ROM is a non-volatile primary memory. It does not lose its content when the power is switched off. Look at the following examples of ROM memories. Under which ROM category does each of the following fall: [6 Marks]
- (i) Flash Disk : \_\_\_\_\_
- (ii) DVD-R: \_\_\_\_\_
- (iii)CD-RW: \_\_\_\_\_
- e) The information stored in storage devices can be accessed in two ways: Sequential access and direct access. Which one of the two does the hard disk use? [2 Marks]

**QUESTION FOUR [20 Marks]**

a) Input devices allow users and other applications to input data into the computer, for processing. The data input to a computer can be in the form of text, audio, video, etc. The data is entered manually by the user or with minimal user intervention. What are the two types of input devices? [2 Marks]

b) Name the four types of optical scanners. [4 Marks]

c) The keyboard is an example of an input device. The design of a keyboard is similar to a standard typewriter. The modern keyboards are \_\_\_\_\_ keyboard. [2 Marks]

d) Mouse is a small hand-held device having two or three buttons on its upper side. In addition to the buttons, mouse also has a small wheel between the buttons. A mouse is classified as \_\_\_\_\_ mouse or \_\_\_\_\_ mouse. [4 Marks]

e) Different kinds of printers are available for different types of applications. Printers are classified into two categories— impact printer and non-impact printer. Give two examples of each. [4 Marks]

| <b>Impact Printers</b> | <b>Non-Impact Printers</b> |
|------------------------|----------------------------|
|                        |                            |
|                        |                            |

f) An image on the monitor is created by a configuration of dots, also known as \_\_\_\_\_. The clarity of image on the computer screen depends on three factors. These are \_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_. [4 Marks]

80%

COMPUTER SCIENCE DEPARTMENT  
INTRODUCTION TO COMPUTING (CS 110)

TEST 2 (OCTOBER, 2014)

INSTRUCTIONS

Answer all questions in the space provided – No back page will be checked. All marks add up to 100. Marks are indicated beside each question. Time allowed is 90 minutes. DO NOT USE ACRONYMS when answering questions.

PERSONAL DETAILS

GROUP: B NAME: Sydney Makabe SID: 14260614

QUESTION ONE

The term 'Internet' is derived from two words—interconnection and networks. Also referred to as 'the Net', Internet is a worldwide system of computer networks, that is, a network of networks, which allows the participants (users) to share information. It consists of thousands of separately administered networks of various sizes and types.

- a) What do the following acronyms (relating to governing bodies overseeing the technical aspects of the Internet) stand for?

- i. IETF Internet Engineering Task Force ✓ [4 Marks]
- ii. W3C World Wide Web Consortium ✓

- b) Each web page has a unique address, called a URL that identifies its location on the Internet. Usually, the format of a URL consists of four parts. Name them.

- Protocol ✓
- Domain name ✓
- ~~Name~~ Location of the Server (e.g. .com, .mil) ✓ [3 Marks]
- File path ✓

- c) To connect to the Internet, a computer requires mainly three different kinds of software. One of them is the browser. There are five(5) major browsers on the market today. What are they? - Mozilla Firefox ✓ [5 Marks]

- Google Chrome ✓
- Opera ✓
- Internet Explorer ✓ [5]
- Avant UC Browser ✓

Torch  
Safari

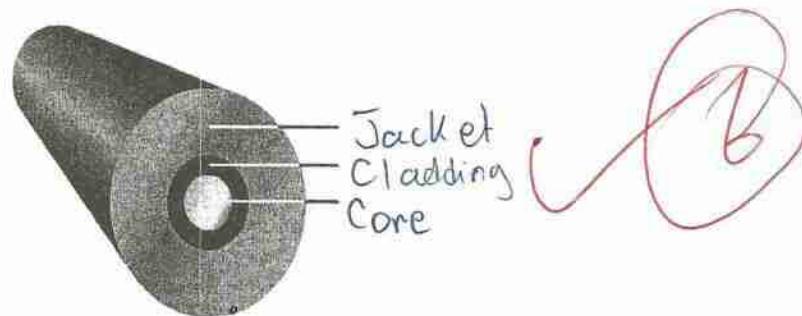
- d) Before connecting to the Internet, you need to buy an Internet connection from an authorized Internet Service Provider (ISP). The speed of accessing the Internet entirely depends upon the type of connection you bought from the ISP. Identify the following types of Internet Connections. [6 Marks]

- i. It operates over normal telephone lines and it can be used simultaneously with the telephone. Dial Up
- ii. It involves the digitization of telephone network so that voice, graphics, text and other data can be provided to users from a single terminal over existing telephone wiring. Integrated Services Digital Network
- iii. It connects the user to the Internet through a digital television line. Cable Modem

- e) Although the World Wide Web is often referred to as the Internet, they are actually two different concepts. The Internet is one of the most popular services available on the World Wide Web. [True/False] True [2 Marks]

## QUESTION TWO

- a) In computer networks, data is sent from one computer to another over a transmission medium. The optic fiber is one of such. Label the diagram below representing the structure of fiber cables. [6 Marks]



- b) State three (3) characteristics that are used to distinguish different network types from each other. Network Topology [6 Marks]

Network Size

Transmission medium used

- c) Identify the following network connecting devices. [6 Marks]

- i. It connects computers in a network or different segments of the same network and each computer attached to it has a simulated LAN segment. Router
- ii. It is used to interconnect the networks in the Internet. Gateway
- iii. It is used to connect two LAN segments. It forwards complete and correct frames to the other segment. It does not forward any electrical interference signals to the other segment. Bridge

### QUESTION THREE

Operating system is system software that controls and coordinates the use of hardware among the different application software and users. OS intermediates between the user of computer and the computer hardware.

- a) Other than Process and Memory Management, state four (4) other functions of the Operating System. - Provides a User Interface [4 Marks]

- Device Management

- File management

- ~~Protection and Security management~~

14

- b) List four (4) activities that are handled by the Operating System as part of its Memory Management task. - allocates memory [8 Marks]

- checks to see available memory

- reallocates memory

- free's memory space

6

- c) Process Scheduling can be non-pre-emptive scheduling or pre-emptive scheduling. In pre-emptive scheduling, the processor executes a process till termination without any interruption. [True/False] False [2 Marks]

- d) There are many different CPU scheduling algorithms that are used to schedule the processes. State three of them. - First Come First Serve Scheduling [6 Marks]

- Round Robin Scheduling

- Shortest Job First Scheduling

- e) What do you call a situation where multiple processes access and manipulate the same data concurrently, in which the final result depends on the order of process execution? Race condition [2 Marks]

- f) A deadlock arises when the four necessary conditions hold true simultaneously in a system. What are the conditions? - Circular wait [4 Marks]

- No preemption - No pre-emption

- Stop and wait

- Mutual exclusion

2

- g) Consider a Mr. X who has a Smartphone. Mr. X claims that the operating system on his Smartphone is one of the leading four in the world today. You know that Mr. X does not have an Iphone. Which three operating systems are likely to be on Mr. X's Smartphone?

Blackberry Operating System

[6 Marks]

Android Operating System

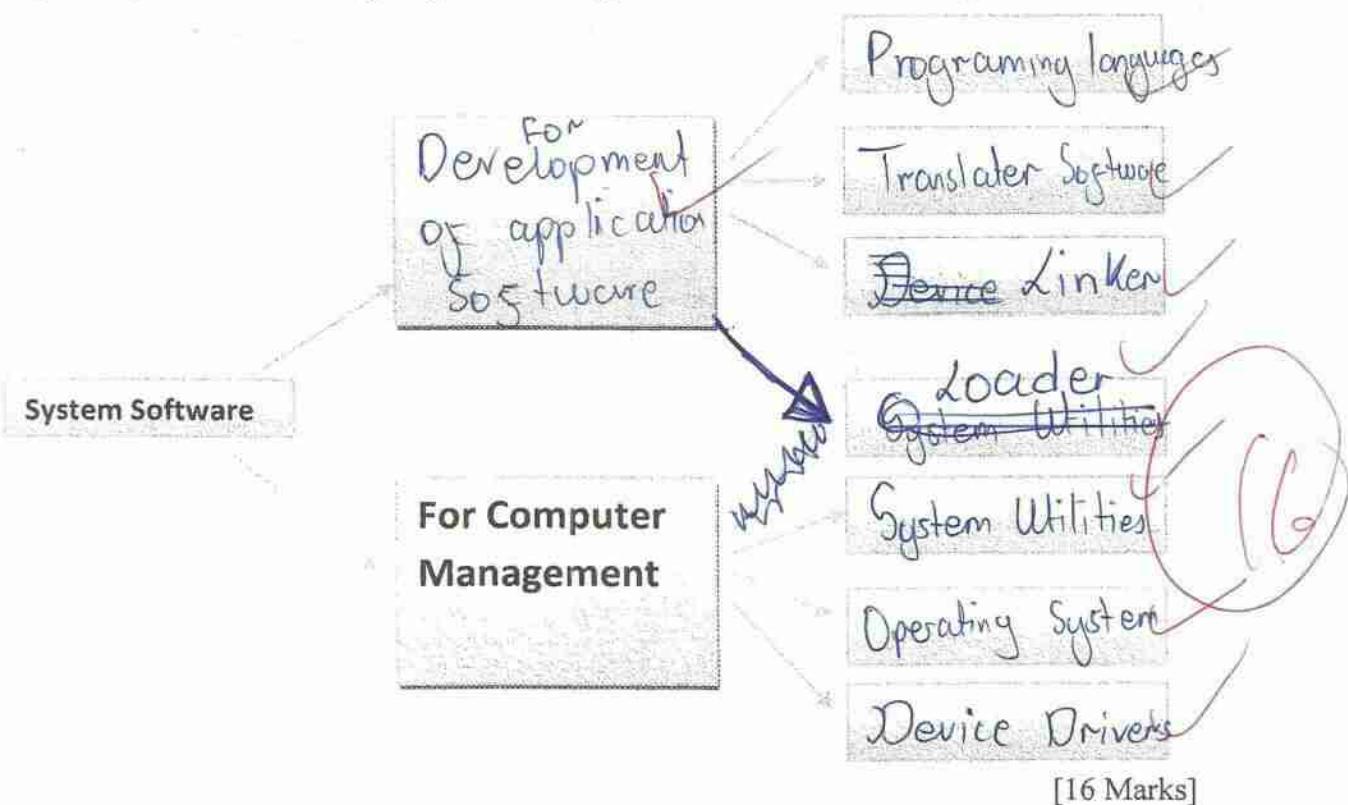
Symbian Operating System

B

## QUESTION FOUR

System software provides the basic functions that are performed by the computer. It is necessary for the functioning of a computer. Application software is used by the users to perform specific tasks.

- a) Complete the following diagram showing software that falls under System Software.



- b) The software that a user uses for accomplishing a specific task is the application software. Application software may be a single program or a set of programs. Give 2 examples under each of the following:

- i. Word Processing Microsoft Office Word, Libre Office writer
  - ii. Spreadsheet Microsoft Office Excel, Libre Office calc
  - iii. Architectural Design CAD CAM
  - iv. Image Processing Adobe Photoshop, Macromedia Fireworks
- [8 Marks]

- c) There are many shades of grey that can be represented by mixing equal amounts of Red, Green, and Blue. In that order. If one such pick is  $\text{FEFEFE}_{16}$ :

- i. How many bits are being used to represent each color from the combination? 8 [1 Marks]
- ii. What is the octal value of Red in that color? 2230 [1] 76 [2 Marks]
- iii. Represent the color as a 32 bit binary number. [2 Marks]

$$\frac{2 \times 8 + 3}{32}$$

$$6 \times 8 = \frac{48}{32}$$

$$\frac{32}{4} 8$$

$$2^4 \times 2^3 \times 2^2 \times 2^1 + 2^0 \times 2^5$$

$$\begin{matrix} F \\ E \\ (15)(14) \end{matrix}$$

14

**TEST 3 – CS 110**

**GROUP:** \_\_\_\_\_ **NAME:** \_\_\_\_\_ **SID:** \_\_\_\_\_

*Same instructions apply: No back pages, no acronyms, answer all.*

**Time: 90 Minutes**

**QUESTION ONE (SECURITY)**

- (a) The security services provide specific kind of protection to system resources. State the six security services. [6 Marks]
- (b) Cryptography is the science of writing information in a “hidden” or “secret” form and is an ancient art. State the three effects desired of a signature for many legal purposes that a digital signature accomplishes. [3 Marks]
- (c) What do you call a security mechanism to protect a local network from the threats it may face while interacting with other networks (Internet). [2 Marks]
- (d) A security policy is a formal statement that embodies the organization’s overall security expectations, goals, and objectives with regard to the organization’s technology, system and information.
- (i) In order to be practical and implementable, what three things must a security policy be defined by? [3 Marks]

(ii) State the six characteristics of a security policy.

[6 Marks]

(e) Give 5 examples of antivirus software one can use on a computer system. The names of your antivirus must be correctly spelt. [5 Marks]

## **QUESTION TWO (INFORMATION SYSTEMS)**

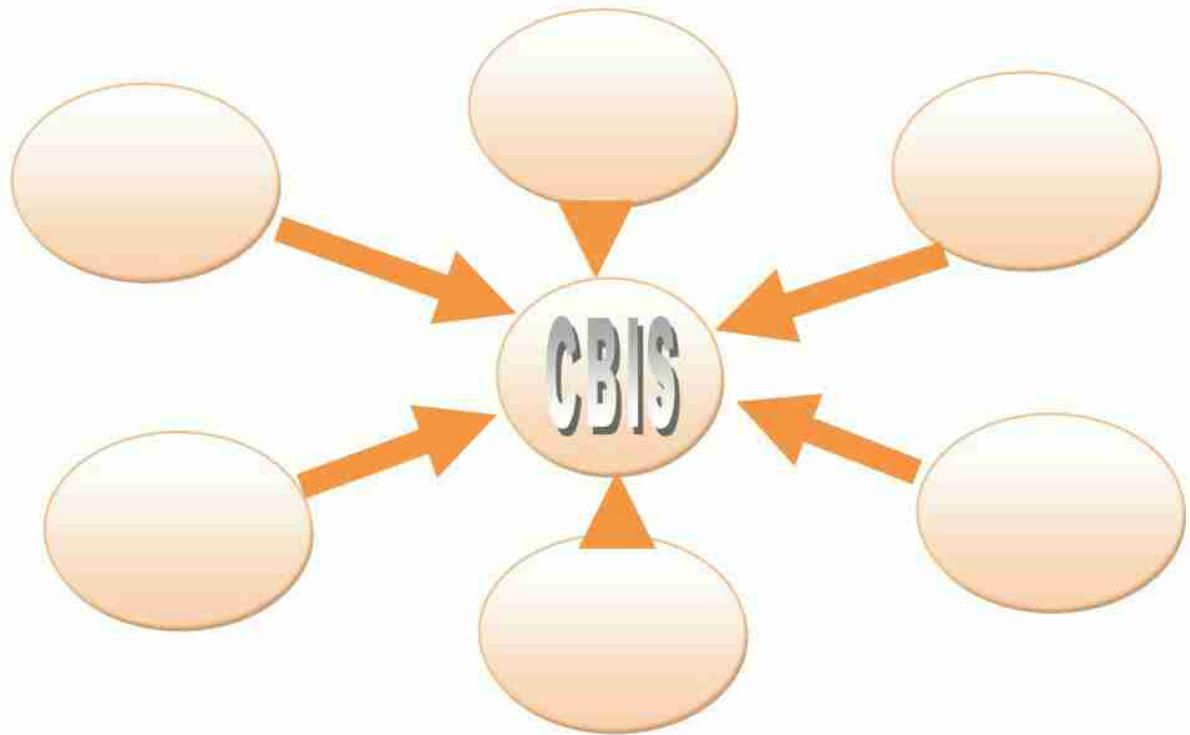
A system is a set of components that work together to achieve a common goal. A system accepts input, processes it, and produces an output

a) State the four (4) main components that make up an information system. [4 Marks]

b) Outline any five (5) characteristics of an information system.

[5 Marks]

- c) Carefully examine the diagram given below. Fill the blank circles to complete the characteristics of CBIS. [6 Marks]



- d) Give two examples of each one of the following information systems: [6 Marks]

(i) Operation Support Systems

(ii) Management Support Systems

(iii) Specialized Systems (Other than E-Commerce)

- e) E-commerce involves any business transaction executed electronically between parties. It uses Internet and Web for doing the business. State five kinds of parties that are involved in e-commerce. [4 Marks]

### **QUESTION THREE (DATABASES)**

A database can be defined as a collection of related data in an organized way. The organized information (i.e. database) serves as a base from which the desired information can be retrieved, conclusions can be drawn and decisions can be made, by further reorganizing or processing these data.

- (a) Give any four (4) examples of Database Management Systems. [4 Marks]

- (b) Key is one of the important concepts of database. It can be of three types. What are they? [3 Marks]

- (c) State three types of binary relationships. [3 Marks]

- (d) Carefully read the following statements and fill in the blanks: [5 Marks]  
(i) The smallest logical structure of storage in a database is called
-

- (ii) Apart from the data, the database also stores \_\_\_\_\_, which describes the tables, columns, indexes, constraints and other items that make up the database.
- (iii) The properties of an entity that characterize and describe it are called \_\_\_\_\_
- (iv) An information technology expert or a well-trained, computer literate who is responsible for the technical operations of a database is called \_\_\_\_\_
- (v) \_\_\_\_\_ is defined as the act of understanding the context in which the information is used.

(e) List any six (6) of the major advantages provided by the DBMS. [6 Marks]

(f) What are the four (4) components of a DBMS? [4 Marks]

#### **QUESTION FOUR (MULTIMEDIA)**

- a) State five ways in which content can be formatted and delivered in a Multimedia Authoring System. [5 Marks]
- b) For each of the following file types, name two extensions (write full names) that are associated with them: [6 Marks]
- (i) Image Files
  - (ii) Audio Files

(iii) Video Files

- c) Consider an image of resolution 1366 x 768. Assume the image is using full-fidelity RGB color of 16 bits each for Red, Green and Blue. Compute the size of the image? [3 Marks]
- d) Sound is produced through vibrations and pressure variations in the air. The vibrations generate a waveform repeated at regular intervals (periods). State the three properties of sound. [3 Marks]
- e) What do you call a special environment that is created using multimedia, where the users feel as if they are in a three-dimensional world? \_\_\_\_\_ [2 Marks]
- f) Under each one of the following, state three (3) software tools that can be used:[6 Marks]
- (i) Audio Creation
  - (ii) 3D Animation



**THE COPPERBELT UNIVERSITY  
SCHOOL OF MATHEMATICS AND NATURAL SCIENCES  
COMPUTER SCIENCE DEPARTMENT**

**2014 SESSIONAL EXAMINATIONS**

**CS 110 – INTRODUCTION TO COMPUTING**

**INSTRUCTIONS**

- ⇒ Time allowed is three (3) hours
- ⇒ There are six (6) questions in this paper. Answer ANY five (5).
- ⇒ Read the questions carefully before answering. Identify words such as State, List, and Outline etc, and proceed as appropriate. If the question asks for a given number of points, you risk losing marks by supplying more than required of you.
- ∅ Do not use acronyms or abbreviations.
- ∅ All questions carry equal marks. Each Question is 20 Marks for a total of 100 Marks.

## **QUESTION ONE**

- a) The digital computers that are available nowadays vary in their sizes and types. The computers are broadly classified into four categories. State the four (4) categories. [4 Marks]
- b) A bus is a set of wires used for interconnection, where each wire can carry one bit of data. One such bus is the data bus. The data bus can use any one of the many bus technologies available for data transmission. Name any three (3) such technologies. [6 Marks]
- c) RAM is used for the temporary storage of input data, output data and intermediate results. The input data entered into the computer using the input device, is stored in RAM for processing. There are two categories of RAM; Static RAM and Dynamic RAM. Of the two, which one:
- (i) uses transistors and capacitors
  - (ii) must be refreshed continually to store information
  - (iii) has memory cells which are larger
  - (iv) is cheaper per unit
- [4 Marks]
- d) Output devices provide output to the user, which is generated after processing the input data.
- (i) What are the two (2) classes into which output devices fall? [2 Marks]
  - (ii) For each one of the two (2) classes you have listed in (i), give 2 examples. [4 Marks]

## **QUESTION TWO**

A computer system consists of hardware and software. The computer hardware cannot perform any task on its own. It needs to be instructed about the tasks to be performed. Software is a set of programs that instructs the computer about the tasks to be performed.

- a) System utility software is required for the maintenance of computer. Other than Data Compression, Disk Compression, Antivirus and Cryptographic utilities, give four (4) more examples of Utility Software. [4 Marks]
- b) Software is usually created using high level languages. Examples of high level languages include C++, Java and Python. Give two (2) examples of low level languages. [4 Marks]
- c) There are many office suites that one can use for productivity. The most common ones are Microsoft Office, Apple iWork, Google Docs and Oracle Libre Office. Of the four, which one is
- (i) Cloud based [2 Marks]
  - (ii) Open source [2 Marks]

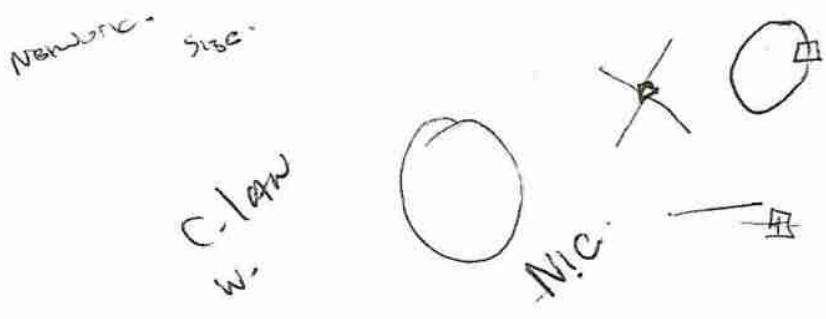
- d) Operating system is system software that controls and coordinates the use of hardware among the different application software and users. Operating systems fall into many classes. Of the classes, into which one does the operating system used in appliances like microwaves, washing machines and traffic control systems fall? [2 Marks]
- e) A process is a program in a state of execution. It is a unit of work for the operating system. A process changes its state as it is executed. There are five states that a process changes into during execution. Which one of the five is not part of the states available when the scheduling algorithm being used is First Come First Served? [2 Marks]
- f) There are six (6) editions of the Windows 7 operating system. List any four? [4 Marks]

### QUESTION THREE

The communication process involves—sender of information, receiver of information, language used for communication, and medium used to establish the communication. Communication between computers also follows a similar process through computer networks.

- a) The data is sent from one computer to another over a transmission medium. The transmission media can be grouped into guided media, and unguided media. Give two (2) examples of:
- (i) Guided media [2 Marks]
  - (ii) Unguided Media [2 Marks]
- b) LAN is a computer network widely used for local communication. It connects computers in a small area like a room, building, office or a campus spread up to a few kilometers.
- (i) Name three (3) common LAN networking topologies. [3 Marks]
  - (ii) For each one of the topologies you have named in (i), give one (1) example of the protocol employed (without repeating the protocols for different topologies). [6 Marks]
- c) In relation to networks, what does the acronym Wi-Fi stand for? [2 Marks]
- d) A concentrator is a device having two or more ports to which the computers and other devices can be connected. Give four (4) examples of concentrators. [4 Marks]
- e) Imagine you have two standalone computers. You want to create a network between the two computers. So you obtain a network cable (RJ45) and directly connect the two computers through the network ports. What is such a LAN network called? [1 Mark]

new  
R1  
R  
W  
T C,W



## QUESTION FOUR

The term 'Internet' is derived from two words—interconnection and networks. Also referred to as 'the Net', Internet is a worldwide system of computer networks, that is, a network of networks, which allows the participants (users) to share information.

- a) Before connecting to the Internet, you need to buy an Internet connection from an authorized Internet Service Provider (ISP). The speed of accessing the Internet entirely depends upon the type of connection you bought from the ISP. Give four examples of internet connections. [4 Marks]
- b) To connect to the Internet, a computer requires mainly three (3) different kinds of software. What are they? [6 Marks]
- c) In relation to the Internet, what does the acronym URL stand for? [2 Marks]
- d) Write the complete URL for our university website. [2 Marks]
- e) There are many kinds of viruses. The level of destructiveness of viruses varies widely. Some viruses display pictures or messages on the screen periodically. Others erase or destroy programs and data. Which of the seven (7) categories of viruses we learnt in class is most likely to:
  - (i) Steal Credit card information stored on your computer [2 Marks]
  - (ii) Overload the network making it unusable [2 Marks]
- f) Is it possible to access Facebook on a mobile phone without being connected to the Internet? (Yes/No) [2 Marks]

## QUESTION FIVE

The widespread use of computers has resulted in the emergence of a new area for security—security of computer. Computer security is needed to protect the computing system and to protect the data that they store and access.

- a) What are the two (2) types of security attacks? [2 Marks]
- b) Hacking is the act of intruding into someone else's computer or network. Name three (3) methods that are used to get the username and password of the system to gain unauthorized access to the system. [6 Marks]
- c) Cryptography is the science of writing information in a "hidden" or "secret" form and is an ancient art. Cryptography is necessary when communicating data over any network, particularly the Internet. Name the three (3) cryptographic schemes. [3 Marks]
- d) Give one (1) example of an algorithm used for each of the Cryptographic Schemes you have listed in (c). [6 Marks]
- e) [True/False] Digital signature scheme is a type of symmetric cryptography. [1 Mark]
- f) In relation to security attacks, what does the acronym DoS stand for? [2 Marks]

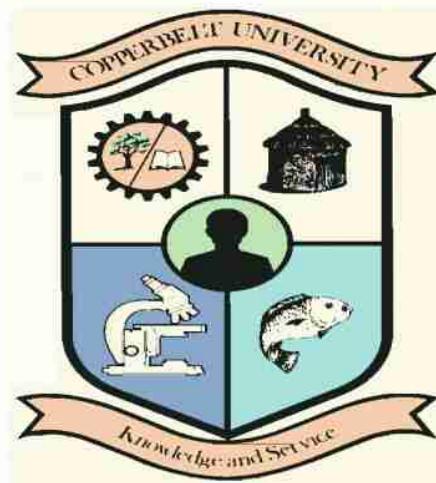
## QUESTION SIX

The word multimedia consists of two words—multi and media. The word multi means many and the word media (plural of medium) are the means through which information is shared. There are different mediums of sharing information like sound, text, image, graphics, animation or video. Multimedia represents information through a variety of media.

- a) Text is an important element of multimedia. The purpose of using text is to write titles, to define menus, to navigate, and to write the content. Text can be written in different fonts: A font is composed of three things—typeface, style and size. Give four (4) examples of typefaces. [4 Marks]
- b) Consider a PNG image of resolution 800 x 600. Assume the image is using full-fidelity RGB color of 16 bits Red, 16 bits Green and 16 bits Blue.
  - (i) Compute the size of the image? [2 Marks]
  - (ii) Compute the size of the image when converted to JPEG [4 Marks]
  - (iii) Compute the size of the image when converted to GIF [4 Marks]
- c) Animation is creating of an illusion of movement from a series of still drawings. To create a feeling of motion of an image (still drawing), the image is projected on the screen as frames. Generally, 30 frames per second are used to make the object appear to be in smooth motion on the screen. Consider a soundless animation that runs for 5 minutes. Compute the size of the animation if it's using PNG images of resolution 1366 x 768 using RGB color of 8 bit Red, 8 bit Green and 8 bit Blue. [4 Marks]
- d) List any two (2) processes which are included in the creation and usage of animation using the computer. [2 Marks]

## GOOD LUCK

*"Success is the preserve of those who are steadfast in their desire, for they become great because when you follow your passion, success follows you"*



**THE COPPERBELT UNIVERSITY**  
**SCHOOL OF MATHEMATICS AND NATURAL SCIENCES**  
**COMPUTER SCIENCE DEPARTMENT**

**2014 DEFERRED SESSIONAL EXAMINATIONS**

**CS 110 – INTRODUCTION TO COMPUTING**

**INSTRUCTIONS**

- ⊕ Time allowed is three (3) hours
- ⊕ There are six (6) questions in this paper. Three (3) in section A and Three (3) in section B.
- ⊕ Answer ALL questions in section A and ANY TWO (2) from section B.
- ⊕ Read the questions carefully before answering. Identify words such as State, List, and Outline etc, and proceed as appropriate. If the question asks for a given number of points, you risk losing marks by giving more than required of you.
- ⊕ All questions carry equal marks. Each Question is 20 Marks.

## **SECTION A**

### **QUESTION ONE**

- a) Registers are high-speed storage areas within the CPU, but have the least storage capacity. Registers are not referenced by their address, but are directly accessed and manipulated by the CPU during instruction execution. List six important registers that can be found inside the CPU. **[6 Marks]**
- b) Using a well labeled diagram, show the interactions between the components that make up the computer systems hardware. **[8 Marks]**
- c) The internal memory and external memory are the two broad categories of memory used in the computer. The internal memory is used by the CPU to perform the computing tasks. List the four key features of internal memory. **[4 Marks]**
- d) What do you call the amount of information (in bits) that a memory can store? **[2 Marks]**

### **QUESTION TWO**

Imagine you have been invited for interviews for a very high paying job. The job, however, requires proficiency in computers. How would you answer the following questions to convince them that you are highly computer literate (i.e. Learnt something from CS110)?

- a) There are many brands of laptop computers that you can find on the market today. Lenovo, Toshiba etc. Some are good (and expensive), others are (in my opinion) very cheap, and well...., not so good. Tell us any other four brands and indicate which one is your favorite. **[2 Marks]**
- b) Our company has been switching the antivirus software from year to year. We have used Microsoft Essentials, Avast, Avira etc. We still have problems maintaining the security of our computers. Give us any 4 alternatives. And gain, which one would you highly recommend from the list you have given us? **[2 Marks]**
- c) We have a security policy in our company. We know it is up-to-date and available to staff. Give us four (4) other characteristics that we should consider looking at before we conclude that our policy is standard? **[4 Marks]**
- d) Nicely put! We know security services provide specific kind of protection to system resources. Any four that you can think of? **[4 Marks]**
- e) You have probably worked with some word processors before. Show us how conversant you are with text presentation by naming any four fonts. Which one is your favorite? **[2 Marks]**

- f) All we have in our company is a small intranet. But we plan to acquire internet service very soon. We hear of Zamtel and Zamnet. But a wide selection would be great. Any four alternatives? [2 Marks]
- g) Other than hardware and software, what four other components can be added to the list to form a Computer Based Information System (CBIS)? [4 Marks]

### QUESTION THREE

The word multimedia consists of two words—multi and media. The word multi means many and the word media (plural of medium) are the means through which information is shared. There are different mediums of sharing information like sound, text, image, graphics, animation or video. Multimedia represents information through a variety of media.

- a) Text is an important element of multimedia. The purpose of using text is to write titles, to define menus, to navigate, and to write the content. Text can be written in different fonts: A font is composed of three things—typeface, style and size. Give four (4) examples of typefaces. [2 Marks]
- b) Consider a PNG image of resolution 800 x 600. Assume the image is using full-fidelity RGB color of 16 bits Red, 16 bits Green and 16 bits Blue.
- (i) Compute the size of the image? [2 Marks]
  - (ii) Compute the size of the image when converted to JPEG [2 Mark]
  - (iii) Compute the size of the image when converted to GIF [1 Mark]
- c) Animation is creating of an illusion of movement from a series of still drawings. To create a feeling of motion of an image (still drawing), the image is projected on the screen as frames. Generally, 30 frames per second are used to make the object appear to be in smooth motion on the screen. Consider a soundless animation that runs for 5 minutes. Compute the size of the animation if it's using PNG images of resolution 1366 x 768 using RGB color of 8 bit Red, 8 bit Green and 8 bit Blue. [3 Marks]
- d) List any two (2) processes which are included in the creation and usage of animation using the computer. [2 Marks]

## **SECTION B**

### **QUESTION FOUR**

- a) State and briefly discuss the stages that make up the instruction cycle. [8 Marks]
- b) For each of the following, write the system utility responsible for the given task. [4 Marks]
  - o Divide a single drive into multiple logical drives \_\_\_\_\_
  - o Provides detailed information about the software installed on the computer and the hardware attached to it \_\_\_\_\_
  - o Encrypt and decrypt files \_\_\_\_\_
  - o Check the computer network and log events \_\_\_\_\_
- c) In relation to emails, what is implied by CC? How does it differ from BCC? [2 Marks]
- d) List any six (6) of the major advantages provided by the DBMS. [6 Marks]

### **QUESTION FIVE**

Fill in the blanks.

**[1 Mark Each]**

- a) \_\_\_\_\_ is an inference or conclusion drawn from the information.
- b) A \_\_\_\_\_ is a security mechanism to protect a local network from the threats it may face while interacting with other networks (Internet).
- c) A \_\_\_\_\_ name is a unique name that identifies a particular website and represents the name of the server where the web pages reside.
- d) Since \_\_\_\_\_ systems are integrated systems; they help to streamline different processes and workflows, allow data to be easily shared across various departments in an organization, improve the efficiency and productivity levels, and improves customer service.
- e) The \_\_\_\_\_ is a collection of linked documents or pages stored on millions of computers and distributed across the world.
- f) The most critical aspect of the modem is its speed of operation. The speed of modem is measured in \_\_\_\_\_
- g) ISDN is an acronym for \_\_\_\_\_
- h) The software that is intentionally included into a system with the intention to harm the system is called malicious software or \_\_\_\_\_ in short.
- i) As a type of Information Systems, ERP stands for \_\_\_\_\_

- j) A \_\_\_\_\_ is self-replicating software that uses network and security holes to replicate itself.
- k) XML is an acronym for \_\_\_\_\_.
- l) Expert system is an applied area of Artificial Intelligence. An expert system is a knowledge-based system having two main components— knowledge base and \_\_\_\_\_.
- m) \_\_\_\_\_ are destructive programs that masquerade as useful programs.
- n) A program that traverses the Web from link to link, identifying and reading pages is called \_\_\_\_\_.
- o) \_\_\_\_\_ virus infects both boot sectors and executable files, and uses both mechanisms to spread
- p) As a characteristic of computers, \_\_\_\_\_ implies that when used for a longer period of time, the computer does not get tired or fatigued.
- q) In relation to computer cables, IDE stands for \_\_\_\_\_
- r) \_\_\_\_\_ is an optical disc storage medium designed to supersede the DVD format.
- s) Conditions necessary for a deadlock includes Circular Wait, Hold and Wait, No-preemption and \_\_\_\_\_
- t) The capacity of a conventional DVD is \_\_\_\_\_.

## **QUESTION SIX**

Write short notes on the following computing concepts.

- a) Sound Sampling
- b) Cyber Space
- c) Secret Key Cryptography
- d) Virtual Reality
- e) Telnet

**[4 Marks Each]**

**GOOD LUCK**

# COPPERBELT UNIVERSITY

30/70

## SCHOOL OF MATHEMATICS AND NATURAL SCIENCES INTRODUCTION TO COMPUTING (CS 110)

TEST 1 (JUNE, 2013)

### INSTRUCTIONS

Answer all questions in the space provided - No back page will be checked. All marks add up to 100. Marks are indicated beside each question. Time allowed is 90 minutes.

### PERSONAL DETAILS

GROUP: A NAME: RODGERS MALADI SID: 13053839

### QUESTION ONE

A computer is defined as an electronic machine that accepts data from the user, processes the data by performing calculations and operations on it, and generates the desired output results.

- a) State five (5) characteristics of a computer

- Monitor
  - Mouse
  - Keyboard
  - Central processing unit
  - speed
  - accuracy
  - Diligence
  - storage capability
  - Versatility
- (does not get tired)

[5 Marks]

- b) The digital computers that are available nowadays vary in their sizes and types. The computers are broadly classified into four categories. What are the four categories? [4 Marks]

- Micro Computers
  - Mini Computers
  - Mainframe Computer
  - Super Computers
- High speed multi user  
multi user multi tasking  
fastest most expensive  
can process data on their own

- c) In two sentences, clearly distinguish between a dumb terminal and an intelligent terminal. [4 Marks]

A dumb terminal is the one which does not do any functionality of the terminal while an intelligent is the one that does the functionality and is quick.

- The Computer System consists of four parts
  - \* Hardware
  - \* Software
  - \* Data
  - \* User

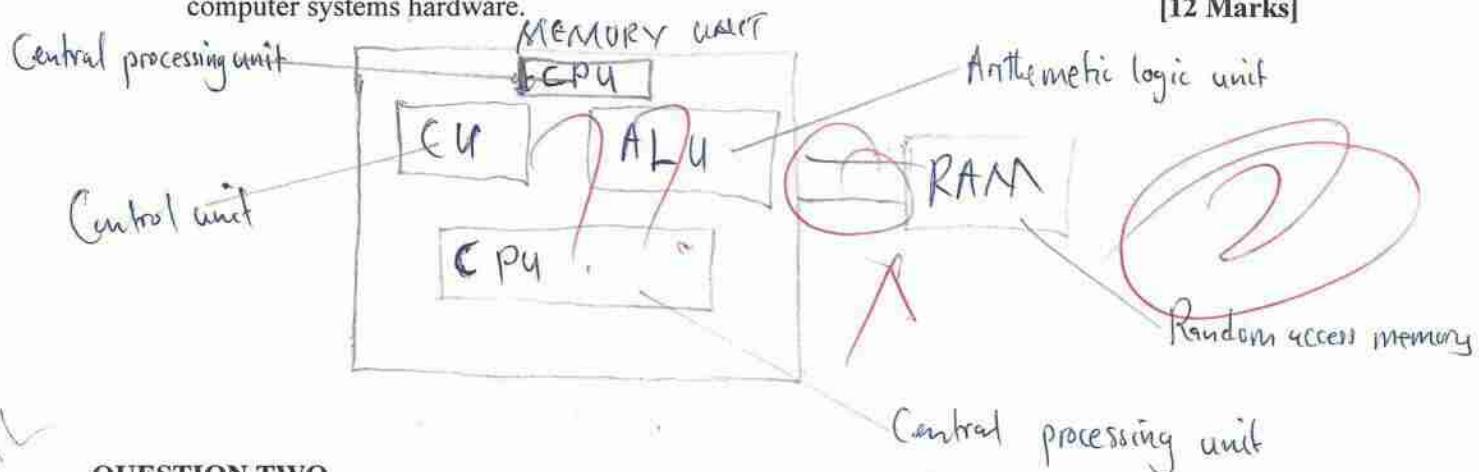
=4

dumb - can store  
or process on its own  
only has 10%.

Intelligent  
- has no  
- process  
- can store

- 1 PS/2 Port (mouse)      5 Game port (joystick)  
 2 PS/2 port (Keyboard)      6 Serial port  
 3 (P/T) Printer Port (Printer)      7 Speakers/line in  
 Parallel ports  
 8 Microphone  
 4 Ethernet port

- d) Using a well labeled diagram, show the interactions between the components that make up the computer systems hardware. [12 Marks]



## QUESTION TWO

- a) There are a number of factors involved that are related to the CPU and have an effect on the overall speed and performance of the computer. In class, we talked about 5 of them. What are they? [5 Marks]

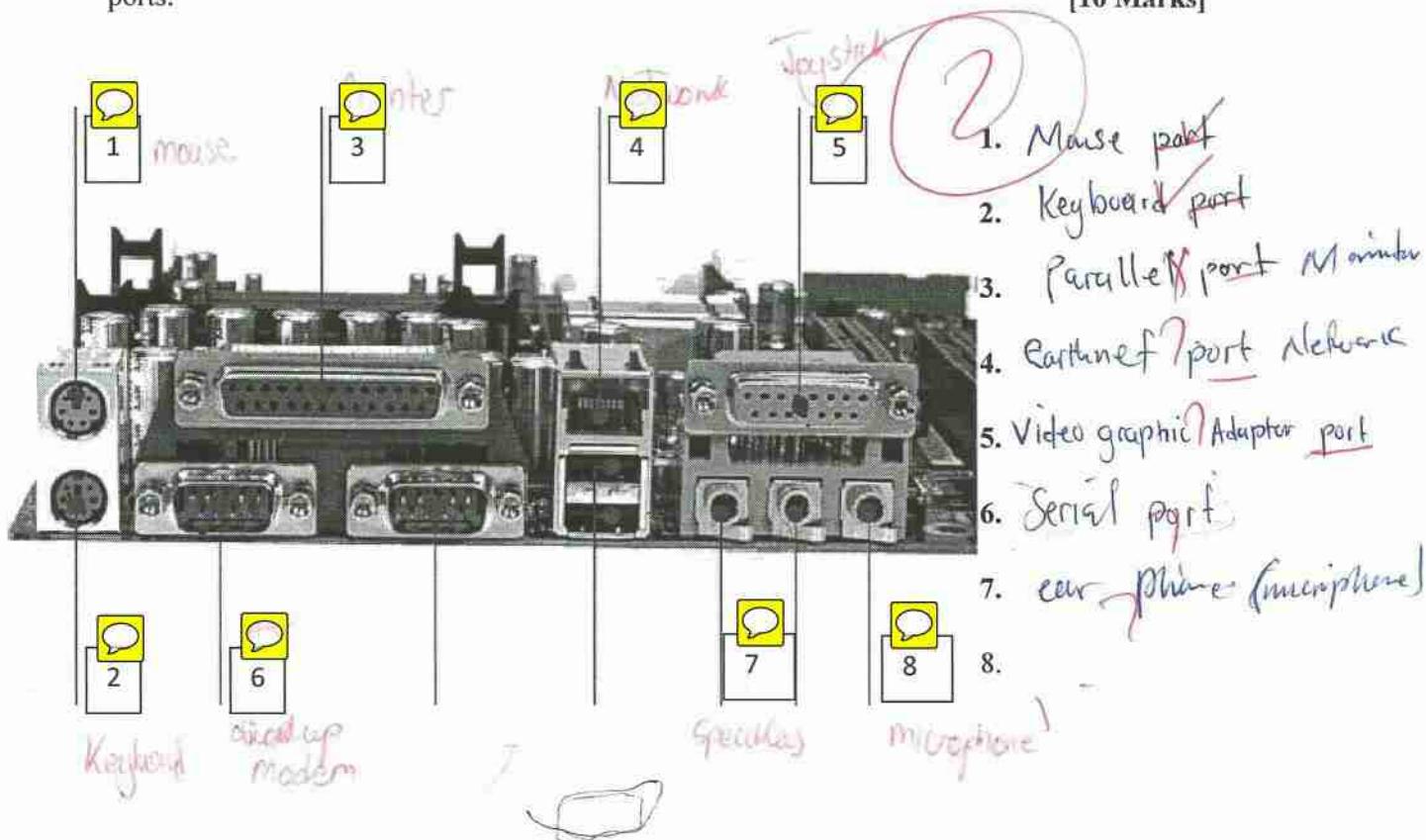
*System clock*  
 - Registers  
 - Ram  
 - Cache  
 - Bus data

- access speed
  - Size of Random access memory
  - Size and number of Registers
  - the Cache memory
- Bus type and speed  
 - System clock.

- b) What does the acronym CMOS stand for? [2 Marks]

*Cache Memory of operating System.  
 Complementary metal-oxide semiconductor.*

- c) From the diagram given below, identify a device that can be connected to each of the labeled ports. [10 Marks]



## power on self Test (POST)

- d) BIOS is the basic program used as an interface between the operating system and the motherboard. It performs a ~~check up~~ <sup>through</sup> check up that checks that the hardware is functioning properly and the hardware devices are present. BIOS also invokes the Random access memory to load the operating system into memory.

Boots trap loader

[4 Marks]

- e) The processor or the CPU is the main component of the computer. What four factors do you have to look at when selecting a processor?

- Size of Random access memory
- Size of Hard drive
- Operating System
- Speed processor (rate e.g 2.7 Ghz)
- DVD writer (D)

- reliability

-

### QUESTION THREE

The computer memory stores different kinds of data like input data, output data, intermediate results, etc., and the instructions. Binary digit or bit is the basic unit of memory. A bit is a single binary digit, i.e.

- a) How many bits make up

i. 1MB ~~8,388,608 bits~~

[2 Marks]

ii. 1TB ~~8,991,366,880,820,8 bits~~  $2^{40} \text{ bytes} \times 8 \text{ bits}$

[2 Marks]

- b) What do you call the amount of information (in bits) that a memory can store? [2 Marks]

~~Data~~  ~~Information~~ - Capacity

- c) Define access time. What is the relationship between access time and the speed of memory?

[3 Marks]

- Access time is the time interval between the read/write memory of a central processing unit.
- The relationship is that the lower the time interval the faster it takes the memory to load and information to be retrieved from it.

- d) Imagine you want to buy a laptop computer, what reasonable specification would you look for under each one of the following components:

[10 Marks]

i. Processor ~~Processor system~~ Intel core i5

ii. RAM 4GB

iii. Screen size 15 inch

iv. Hard disk 500GB

v. Manufacturer HP

Ans. 100%

1mb ~ 1024 bytes

1by - 8

= 14

- e) In relation to memory, what is used in EPROM to erase data? [2 Marks]

Control unit 

- f) There are different methods to format a disk. File Allocation Table (FAT) is the commonly used logical format for disk formatting performed by Windows. State four areas which are created when formatting a disk using FAT. [4 Marks]

- ~~File allocation table~~  
- ~~Boot Sector~~  
-

- File allocation Table  
- Boot sector  
- Data ~~sector~~  
- Root Directory

#### QUESTION FOUR

- a) What are the two categories into which input devices are classified? [4 Marks]

- Hand ~~entry~~ devices ~~entry~~ devices  
- the System ~~input~~ devices - Human data entry  
- Source data entry

- b) Pointing devices are used for providing the input to computer by moving the device to point to a location on computer monitor. The input data is not typed; instead, the data is entered by moving the pointing device.

- i. Other than mouse, give two more examples of pointing devices. [4 Marks]

- JoyStick  
- track ball

- ii. A Mouse can be classified as being of which two types? [4 Marks]

-> Hand ~~entry~~ device - physical mouse  
- Optical mouse

- c) What are the two categories into which output devices are classified? [4 Marks]

- Hard Copy devices  
- soft copy devices

- d) Give two examples of non-impact printers and one for impact printer. [3 Marks]

- ~~Laser~~ Jet printers ~~Inkjet~~ laser Jet printer } Non Impact - Drum  
- Inkjet printer } - Dot matrix

? Impact printer

- e) An image on the monitor is created by a configuration of dots, also known as pixels. The clarity of image on the computer screen depends on which three factors? Define each one of the three factors. [6 Marks]

- ( i ) Number of Dots, the more the dots the finer the image  
( ii ) Speed of dots, like in videos the faster the dots the clearer the video looks  
( iii ) Size of dots, small sized pixels form a clearer image compared to bigger dots.

- Resolution of screen - the more the number of pixels the sharper is the image  
- Dot pitch - diagonal distance between two colored pixels on a display screen  
- Refresh rate - the number of times per second the pixels are recharged so that their glow remains bright

# COPPERBELT UNIVERSITY

## SCHOOL OF MATHEMATICS AND NATURAL SCIENCES INTRODUCTION TO COMPUTING (CS 110)

TEST 2 (OCTOBER, 2013)

69/100

### INSTRUCTIONS

Answer all questions in the space provided – No back page will be checked. All marks add up to 100.  
Marks are indicated beside each question. Time allowed is 90 minutes.

### PERSONAL DETAILS

GROUP: A NAME: RODGERS MALADI SID: 13053839

### QUESTION ONE

The software that a user uses for accomplishing a specific task is the application software. Application software may be a single program or a set of programs.

- a) A set of programs that are written for a specific purpose and provide the required functionality is called a software package. Microsoft Office is an example of a software package.

- (i) Other than Microsoft Word, list any five applications that you can find in Microsoft Office.

- Microsoft access ✓
  - Microsoft powerpoint ✓
  - Microsoft excel ✓
  - Microsoft Publisher ✓
  - Microsoft one note ✓
- [5 Marks]

- (ii) On a computer where you do not want to use Microsoft Office, what three (3) alternative software packages (Offering similar functionality) can you use?

- Note pack X
  - Open office ✓
  - Google docs ✓
  - King soft ✓
  - Oracle libre office ✓
- [3 Marks]

- (iii) From your answer in (ii), choose one software package, and for the selected package, state the name of the presentation software, word processing software and spreadsheet software. [6 Marks]

| Selected Package         |                | Apple i work |
|--------------------------|----------------|--------------|
| Presentation Software    | Power point    |              |
| Word Processing Software | Microsoft Word | Open office  |
| Spreadsheet Software     | Excel          |              |

# COPPERBELT UNIVERSITY

## SCHOOL OF MATHEMATICS AND NATURAL SCIENCES INTRODUCTION TO COMPUTING (CS 110)

TEST 2 (OCTOBER, 2013)

69/100

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- Microsoft access ✓
  - Microsoft powerpoint
  - Microsoft Excel ✓
  - Microsoft Publisher
- Microsoft One Note [5 Marks]

(ii) On a computer where you do not want to use Microsoft Office, what three (3) alternative software packages (Offering similar functionality) can you use?

- Note pack X
- Open office
- Google docs
- King soft
- Oracle Libre Office
- Apple i work

(iii) From your answer in (ii), choose one software package, and for the selected package, state the name of the presentation software, word processing software and spreadsheet software. [6 Marks]

| Selected Package         |                |              |
|--------------------------|----------------|--------------|
| Presentation Software    | Power point    | Apple i work |
| Word Processing Software | Microsoft Word | Open office  |
| Spreadsheet Software     | Excel          |              |

(iv) Name any six ways in which different kinds of software is made available to the user. [3 Marks]

- Retail Software
- Demo Software
- Public Domain Software
- Freeware Software
- Open Source Software

- Shareware Software

b) System utility software is required for the maintenance of computer. Given below is a list of functionalities which can be achieved by utility software. Fill in the blanks the appropriate utility software that can achieve the task. [4 Marks]

- (i) Disk partitioning utility to divide a single drive into multiple logical drives.
- (ii) Disk cleaner utility to find files that have not been used for a long time
- (iii) Back-up utility to make a copy of all information stored on the disk.
- (iv) System profiling utility to provide detailed information about the software installed on the computer and the hardware attached to it.

c) Give 2 examples of each of the following programming languages [4 Marks]

(i) Third Generation C++, Java, C++

(ii) Fifth Generation LISP, Prolog

## QUESTION TWO

Operating system is system software that controls and coordinates the use of hardware among the different application software and users. OS intermediates between the user of a computer and the computer hardware.

a) Operating Systems are classified into different types depending on their capability of processing.

What are the types?

- Single user
- Multi user
- Multi tasking
- Multi processing

- Real time operating system

- Embedded operating system

b) Other than Memory and Process management, state any four functions of the Operating System

- File management
- User interface
- Device Driver
- Protection and security

[4 Marks]

- c) List any four (4) activities which are handled by the operation system as part of Memory Management. [4 Marks]

- allocate memory
  - keep track of memory usage
  - free memory
  - To allow application not completely in memory to run (virtual memory)
- re-allocate memory to a program when a used block is freed.

- d) A process is a program in a state of execution. It is a unit of work for the operating system. Is it possible for a program to have state? If yes, what are the possible states that a program can be in at any given time? If no, Why? [4 Marks]

- New
  - Running State
  - Running State
  - Waiting State
- Yes - Terminated No

- e) When a process is non pre-emptive, what does it mean (in 2 lines)? Which one of the three scheduling algorithms used by the CPU is pre-emptive? [2 Marks]

- it means a processor executes a process till termination without interruption.
- A pre-emptive process is Round Robin (RR)

- f) Give three examples of desktop Operating Systems and two for mobile Operating Systems (examples in each category must be from different vendors) [5 Marks]

- | Desktop       | Mobile       |
|---------------|--------------|
| - Linux       | - Android    |
| - Windows X P | - Blackberry |
| - Windows 7   |              |

### QUESTION THREE

A computer network is an interconnection of two or more computers that are able to exchange information.

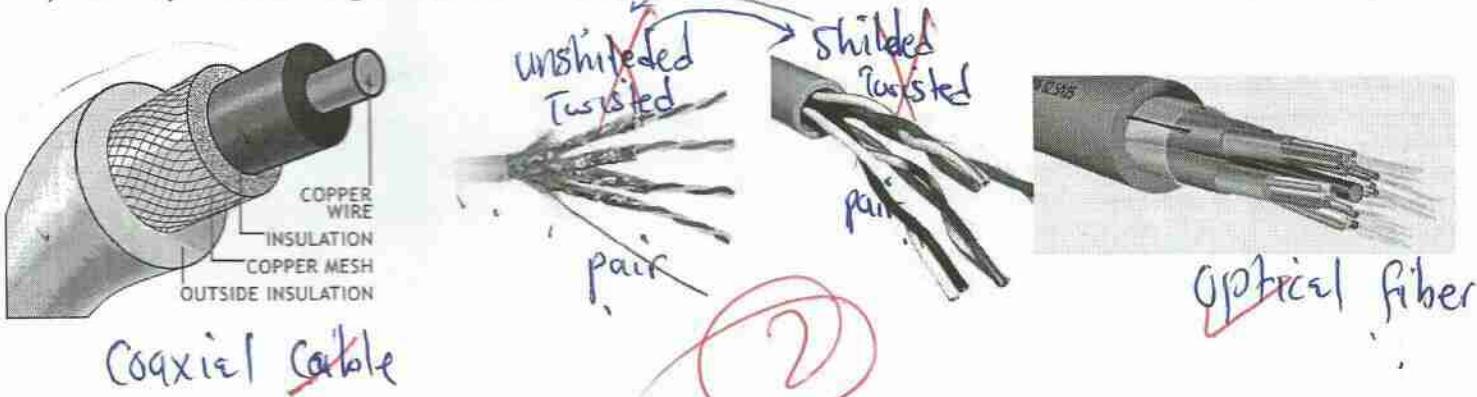
- a) State four uses of a computer network

- Resource Sharing
- Sharing information.
- As a communication media.
- for Back-up and support.

[4 Marks]

b) Identify the following cables used in computer networks:

[4 Marks]



Coaxial cable

Optical fiber

c) State the three characteristics that distinguish different networks from each other.

[3 Marks]

- Size of Network ✓
- transmission technology ✓
- ~~Transmission~~ ~~External~~ Topology ✓ (circled '3')

d) Define a concentrator.

[1 Mark]

is a device having two or more ports when to connect  
a computer network device

e) What are the two main functions of a concentrator?

[2 Marks]

- To Connect two or more computers to a network
- 

f) Identify each of the following network connecting devices.

[4 Marks]

(i) A hardware device through which the computer connects to a network -

Network Interface Card

(ii) They cannot identify complete frames. Thus, in addition to the valid transmissions from one segment to another, they also propagate any electrical interference occurring on a segment to other segment. Repeater

(iii) Uses a technique that reads the MAC address of the data frame and forwards the data to the appropriate port. Router

Switch

(iv) Can accept a packet formatted for one protocol and convert it to a packet formatted for another protocol, before forwarding it. Switch Router

g) The RGB color model is an additive color model in which red, green, and blue light are added together in various ways to reproduce a broad array of colors. Each one of the three colors is represented using 8 bits (i.e. 24 bits for three colors combining to form one). For example, Purple is a range of hues of color occurring between red and blue.

If purple is represented as 128 red, 0 green, and 128 blue, represent the color purple as; (Just write answers here, use the back of page 4 for your working)

- (i) A twenty four (24) bit binary value.

[2 Marks]

~~11001010000000~~

- (ii) A thirty two (32) bit binary value

[1-Mark]

~~1100101000000000~~

- (iii) An hexadecimal value

[2 Marks]

~~X~~

- (iv) An octal value

~~X~~

[2 Marks]

#### QUESTION FOUR

- a) A program written in assembly language uses symbolic representation of machine codes needed to program a particular processor (CPU) or processor family. The symbolic representation is known as Mnemonics. [2 Marks]
- b) Translator software is used to convert a program written in high-level language and assembly language to a form that the computer can understand. Three types of Translator software are Assembler, Compiler, and Interpreter. [3 Marks]
- c) The acronyms CAD (as in AutoCAD) stands for Creating architectural design [2 Marks]
- d) On a computer without Internet Explorer, alternative software that can be used includes Mozilla fire fox and Google chrome. [4 Marks]
- e) In process management, a situation where multiple processes access and manipulate the same data concurrently, in which the final result depends on the order of process execution, is called race Condition. [2 Marks]
- f) A deadlock is a situation when a process waits endlessly for a resource and the requested resource is being used by another process that is waiting for some other resource. Two ways of handling deadlocks include deadlock prevention and deadlock avoidance [4 Marks]
- g) When working on a computer, you can use Adobe photo shop to edit pictures; Windows media player to play music, and Adobe reader to open a PDF file. [6 Marks]
- h) True or False. PDF stands for Portable Document File. True false [2 Marks]

PDF Portable Document format.

**COPPERBELT UNIVERSITY**  
**SCHOOL OF MATHEMATICS AND NATURAL SCIENCES**  
**INTRODUCTION TO COMPUTING (DCS 111)**  
**TEST 2 (OCTOBER, 2013)**

**INSTRUCTIONS**

*Answer all questions in the space provided. Total Mark is 50. Marks are indicated beside each question. Time allowed is 1 Hour 30 minutes. Calculators should not be used*

**PERSONAL DETAILS**

NAME: COLLIINS MUKUPA MIMBULULU Programme: DIP METALLURGY  
Student Number: 13059714

**QUESTION ONE (User Computer Interaction)**

Computer hardware cannot be used if the computer system does not have software installed on it.

- a) What is software?: is the set of programs that instructs the computer in what should be done. [1 mark]
- b) Briefly describe the difference between system software and application software. [2 marks]
- System software provides basic functions that is used by the computer while Application software is used by user to perform specific function or task.
- c) State briefly any two uses of system software on a computing device. [2 marks]
- (1) provides basic function that is used by the computer.
- (2) provides the good interface between the user and the computing device in order for them to perform a good working environment.

- d) In one sentence, state the use of system utility software on a computer. [1 mark]

for the maintenance of the computer.

- e) In one sentence state the use of programming language software on a computer. [1 mark]

to put a program in the computer for it to follow.

- f) Software can be made available legally in a number of ways. State briefly the following kinds of software. (one sentence for each and one example) [1 mark each]

i. Retail Software: This are softwares which are sold in retail shops.

ii. "Original Equipment Manufacturer" software: This are soft wares which are sold with bundles collectors edition.

iii. Shareware Software: This are softwares which are for free but they have a procedure to follow. (copyright).

iv. Freeware Software: This are softwares for free. (are used by anyone. Microsoft)

v. Open-Source Software: This are open for anyone by they have the procedure to follow e.g. They are made by some one. (copyright).

- g) State briefly an application that can be used to do the following tasks

i. Coming up with an accounting balance sheet: Accounting software

ii. Making a presentation: Presentation software

iii. Assist in Architectural Design: Design software

## QUESTION TWO (OPERATING SYSTEM)

- a) Operating Systems are classified in a number of ways. Describe briefly the following types of operating systems and give an example of each. [1 mark each]

i. Single User and Single Task OS: it is used by one person at a time and one task at a time. e.g. personal computer. (P.C)

- ii. Single User and Multitasking OS: it can execute more than one task at a time. e.g. personal computer (P.C)
  - iii. Multiuser OS: is used by many users in network systems. e.g. super computers.
  - iv. Real Time OS: It is used for a particular event personal computer (P.C).
  - v. Embedded OS: is embedded in the random access memory (RAM) of a device. e.g. washing machine.
  - vi. Multiprocessing OS: it has more than one processor to process data e.g. super computer
- b) The operating system's functions can be classified as memory management functions, process management function, device management function, security function and file management.

i. Briefly state any 2 file management functions of the operating System.

(1) to create a file.

(2) delete a file.

ii. Briefly state any 2 security functions of the operating system.

(1) To make sure that there is a convenient way of using a computer. Is this a security function?

(2) To provide a password to the computer.  
so that

iii. Briefly state any 2 memory management functions of the operating system.

(1) to allocate memory

to provide memory

(2) to provide memory Incomplete

iv. Briefly state any 2 process management functions of the operating system.

(1) to execute the data control access & shared use  
control access

(2) to translate the data in an understanding manner. Create & delete of

v. Briefly state any 1 device management function of the operating system.

To open a device when it is connected to the computer.

### QUESTION THREE (DATA REPRESENTATION)

Digital computers use number system to represent data inside a computer. The number system used is either Binary number system, Octal number system or Hexadecimal number system.

a) State briefly the steps that one needs to take to convert an integer number from decimal to any other number system. [3 marks]

1. Divide  
(i) multiply the given number by the base in which you are given but the base should have a power with it which is the position value of the number you are multiplying.

2. Then get the remainders that remains when you divide. that is your base.

$$\begin{array}{r} 234_{\text{base}} \\ \times 8 \\ \hline 18 \\ \hline 24 \\ \times 8 \\ \hline 16 \\ \hline 2 \end{array}$$

b) State briefly the steps that one needs to take to convert a fraction from decimal to any other number system. [3 marks]

(i) multiply the given fraction by the base given  
(ii) the answer you get, pick the integer part as yours first number continue for at least four times  
(iii) Read the number you get going down

a) Convert the number 2AD from Hexadecimal to decimal number system [2 marks]

$$\begin{array}{r} \text{2 A D} \Rightarrow 2 \ 10 \ 13 \\ \hline 13 \times 16^0 = 13 \\ 10 \times 16^1 = 160 \\ 2 \times 16^2 = 256 \\ \hline 4292 \end{array}$$

b) Convert the number 1345.67 from decimal to Octal number system [4 marks]

(i) for the integer part.

| base | no = | (R) | remainder |
|------|------|-----|-----------|
| 8    | 1345 | 1   |           |
| 8    | 168  | 0   |           |
| 8    | 21   | 5   |           |
| 8    | 2    | 2   |           |
| 8    | 0    |     |           |

~~205~~ 2501<sub>8</sub>

for the fraction part

$$\begin{array}{r} 0.67 \\ \times 8 \\ \hline 5.36 \\ 0.36 \\ \times 8 \\ \hline 2.88 \\ 0.88 \\ \times 8 \\ \hline 7.04 \\ 0.04 \\ \times 8 \\ \hline 0.04 \\ \end{array} \quad \begin{array}{r} 5 \\ 2 \\ 7 \\ 0 \\ 5270 \\ \hline 7 \\ 0 \\ 4 \\ \end{array}$$

∴ The number 1345.67 to octal number system = 2501.5270

c) Convert the number 111.00101011 from Binary straight into Hexadecimal number system. [3 marks]

$$\underbrace{0111}_{7} \underbrace{0010}_{2} \underbrace{1011}_{B} = 72B_{16}$$

$$\begin{array}{r} 0111 \\ | \quad | \quad | \\ 1 \times 2^0 = 1 \\ 1 \times 2^1 = 2 \\ 1 \times 2^2 = 4 \\ 0 \times 2^3 = 0 \\ \hline 7 \end{array}$$

$$\begin{array}{r} 1011 \\ | \quad | \quad | \\ 1 \times 2^0 = 1 \\ 1 \times 2^1 = 2 \\ 0 \times 2^2 = 0 \\ 1 \times 2^3 = 8 \\ \hline 11 \end{array}$$

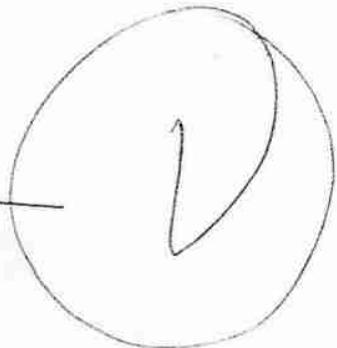
$$\begin{array}{r} 0010 \\ | \quad | \quad | \\ 0 \times 2^0 = 0 \\ 1 \times 2^1 = 2 \\ 0 \times 2^2 = 0 \\ 0 \times 2^3 = 0 \\ \hline 2 \end{array}$$

- d) Convert the number 101100111011 from Binary straight into Octal Number System. [3 marks]

$$\begin{array}{r} \overbrace{100101100111011_2}^{\text{2}} \quad \overbrace{1}^{\text{3}} \quad \overbrace{1}^{\text{2}} \quad \overbrace{1}^{\text{7}} \quad \overbrace{1}^{\text{3}} \\ = \overbrace{2 \quad 3 \quad 2 \quad 7 \quad 3}^{\text{13113}_8} \end{array}$$

$$\begin{array}{r} 111 \\ | \quad | \\ 1 \times 2^0 & 1 \\ | \times 2^1 & 2 \\ 1 \times 2^2 & 4 \\ \hline 7 \end{array}$$

$$\begin{array}{r} 011 \\ | \quad | \\ 1 \times 2^0 & 1 \\ | \times 2^1 & 2 \\ 0 \times 2^2 & 0 \\ \hline 3 \end{array}$$



$$\begin{array}{r} 001 \\ | \quad | \\ 1 \times 2^0 & 1 \\ 0 \times 2^1 & 0 \\ 0 \times 2^2 & 0 \\ \hline 1 \end{array}$$

## QUESTION FIVE

Define the following terminologies as they relate to computing; [4 Marks each]

a) Plug and Play

Devices whose device drivers are already installed on the computer.

b) Cyber Space

The space or environment where people interact with computers and other people through the Internet and other digital technologies.

c) Telnet

A protocol that allows users to log in to a remote computer and use its resources as if they were directly connected to it. It is often used for remote access to servers and networked computers.

d) Motherboard

The main circuit board of a computer system. It contains the central processing unit (CPU), memory, and various connectors for other components like the hard drive, graphics card, and RAM.

e) Android



#### QUESTION FOUR

Imagine a reputable company has called you for interviews. You are taking the challenge. Your Curriculum Vitae, so nicely polished, says that you are computer literate. The interviewers on the other hand need proof. If the following questions are the ones that are going to prove that you know just a lot about computer productivity tools, how would you answer them?

- a) List any 2 email service providers other than yahoo and Gmail. [2]
- b) What software application would you use to achieve each of the following? [4]
  - o Watch a movie on a computer (Other than windows media player)  
*VLC*
  - o Edit an image  
*Adobe Photoshop*
- c) Other than Internet explorer and Google Chrome, give 2 alternative web browsers? [2]  
*Fire Fox Mozilla*  
*Opera*
- d) If a computer literacy item in a vacancy requires 45 WPM, what's implied? [2]  
*1 minute*
- e) What search engine would you use if google.com is down? [2]  
*ASK.COM*
- f) What is the URL for CBU's website? [2]
- g) On a computer without Microsoft office, what would you use to type a letter? [2]
- h) If an advert for a computer on sell reads "Pentium 4 inside". What's implied? [2]
- i) What is Wikipedia? [2]

### QUESTION THREE

a) In relation to networking, what do the following acronyms stand for? [3]

- o DSL \_\_\_\_\_
- o ISDN \_\_\_\_\_
- o ISP \_\_\_\_\_

b) Give any three examples of commercial ISPs in Kitwe. [3]

Coppernet  
Microlink  
Zantel

c) Define e-commerce. [1]

online

d) In relation to emails, what is implied by CC? How does it differ from BCC? [3]

CC carbon copy

BCC carbon copy

e) List any 6 categories of viruses [6]

- 1 Boot
- 2 File
- 3 Stealth
- 4 Worm
- 5 Trojan horse
- 6 Macro

f) Give 4 examples of antivirus software. [4]

Antivirus

McAfee

Norton

BitDefender

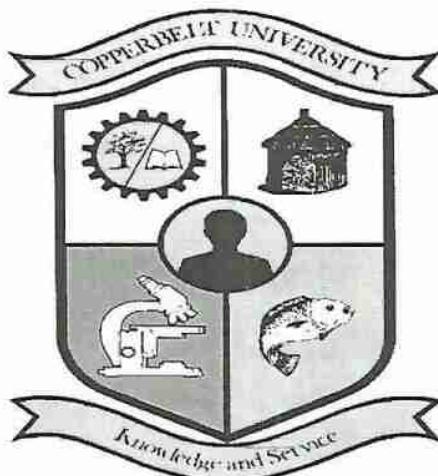
b) Using a diagram, illustrate the interaction between the users and computer hardware showing different levels of the user-computer hierarchy [3]

c) Outline three basic functions of the operating system [3]

d) For each of the following, write the system utility responsible for the given task. [8]

- o Divide a single drive into multiple logical drives Disk partition
- o Provides detailed information about the software installed on the computer and the hardware attached to it System Profiler Utility
- o Encrypt and decrypt files Cryptographic utility
- o Check the computer network and log events network manager

e) Clearly distinguish between public domain software and open source software. [4]



**THE COPPERBELT UNIVERSITY  
SCHOOL OF MATHEMATICS AND NATURAL SCIENCES  
COMPUTER SCIENCE DEPARTMENT**

**2013 SESSIONAL EXAMINATIONS**

**CS 110 – INTRODUCTION TO COMPUTING**

**INSTRUCTIONS**

- ⊕ Time allowed is three (3) hours
- ⊕ There are six (6) questions in this paper. Three (3) in section A and Three (3) in section B.
- ⊕ Answer ALL questions in section A and ANY TWO (2) from section B.
- ⊕ Read the questions carefully before answering. Identify words such as State, List, and Outline etc, and proceed as appropriate. If the question asks for a given number of points, you risk losing marks by giving more than required of you.
- ⊕ All questions carry equal marks. Each Question is 20 Marks.

## SECTION A

### QUESTION ONE

A *computer* is an electronic machine that accepts data from the user, processes the data by performing calculations and operations on it, and generates the desired output results. Imagine you have been given an LCD monitor, a mouse, keyboard and an empty computer case by a friend. You know components that are supposed to be put inside the case so that your computer becomes functional. Ignore all the cables, PCI cards and the CD ROM;

- processors  
CPU  
screen  
monitor
- a) List 6 components that you can buy from a shop to complete the unit, without which the computer cannot work. [12 Marks]
  - b) From the components you have listed in (a), Choose any four (4) and provide acceptable specifications that you can look for. [4 Marks]
  - c) What do the acronyms LCD stand for in LCD Monitor? [2 Marks]
  - d) True/False – You can mix the components you have listed in (a) regardless of the vendor, and the computer can work. [2 Marks]

### QUESTION TWO

A computer system consists of hardware and software. The computer hardware cannot perform any task on its own. It needs to be instructed about the tasks to be performed. Software is a set of programs that instructs the computer about the tasks to be performed.

- a) Give 4 examples of each of the following Operating Systems
  - (i) Microsoft OS,
  - (ii) Linux OS
  - (iii) Mobile OS[6 Marks]
- b) Assuming you are using any Microsoft OS, List any 6 utilities that you can find under Start><All Programs><Accessories><System Tools> [3 Marks]
- c) Consider the following table that has 3 Major Office Suites, Complete the table by indicating the application under each of the four categories: [6 Marks]

| Suite               | Word Processor | Spreadsheet | Presentation | Database |
|---------------------|----------------|-------------|--------------|----------|
| Microsoft Office    | word           | excel       | powerpoint   | access   |
| Oracle Libre Office | writer         | calc        | impress      | base     |
| Apple iWork         | pages          | numbers     | keynote      | numbers  |

- d) There are many web browsers available on the market today that can be freely installed on a personal computer. List the major five (correctly spelt). [5 Marks]

open source  
- mozilla  
- google chrome  
- internet explorer  
- safari

### QUESTION THREE

Imagine you have been invited for interviews for a very high paying job. The job, however, requires proficiency in computers. How would you answer the following questions to convince them that you are highly computer literate (i.e. Learnt something from CS110)?

- a) There are many brands of laptop computers that you can find on the market today. Lenovo, Toshiba etc. Some are good (and expensive), others are (in my opinion) very cheap, and well...., not so good. Tell us any other four brands and indicate which one is your favorite. *- dell, acer, packard boeing, Samsung, apple* [2 Marks]
- b) Our company has been switching between antivirus software from year to year. We have used Microsoft Essentials, Avast, Avira etc. We still have problems maintaining the security of our computers. Give us any 4 alternatives. And gain, which one would you highly recommend from the list you have given us?  
*- windows defender, McAfee, Norton* [2 Marks]
- c) We have a security policy in our company. We know it is up-to-date and available to staff. Give us four (4) other characteristics that we should consider looking at before we conclude that our policy meets standard? *- detailed, specific, enforceable* [4 Marks]
- d) Nicely put! We know security services provide specific kind of protection to system resources. Any four that you can think of? [4 Marks]
- e) You have probably worked with some word processors before. Show us how conversant you are with text presentation by naming any four fonts. Which one is your favorite? [2 Marks]
- f) All we have in our company is a small intranet. But we plan to acquire internet service very soon. We hear of Zamtel and Zamnet as possible ISPs. But a wide selection would be great. Any four alternatives? [2 Marks]
- g) Other than hardware and software, what four other components can be added to the list to form a Computer Based Information System (CBIS)? [4 Marks]

- *Signal*
- *hardware*
- *feild work*
- *process*

*Telnet*

*Telecommun*

## **SECTION B**

### **QUESTION FOUR**

Fill in the blanks. (Just write answers. Do not copy the entire statement) [1 Marks Each]

- a) inference is an inference or conclusion drawn from the information.
- b) A firewall is a security mechanism to protect a local network from the threats it may face while interacting with other networks (Internet).
- c) A domain name is a unique name that identifies a particular website and represents the name of the server where the web pages reside.
- d) Since ERP systems are integrated systems; they help to streamline different processes and workflows, allow data to be easily shared across various departments in an organization, improve the efficiency and productivity levels, and improves customer service.
- e) The WWW is a collection of linked documents or pages stored on millions of computers and distributed across the world.
- f) The most critical aspect of the modem is its speed of operation. The speed of modem is measured in Kilobits per second.
- g) ISDN is an acronym for Integrated Service Digital Network.
- h) The software that is intentionally included into a system with the intention to harm the system is called malicious software or malware in short.
- i) As a type of Information Systems, ERP stands for \_\_\_\_\_.
- j) A virus is self-replicating software that uses network and security holes to replicate itself.
- k) XML is an acronym for extensible markup language.
- l) Expert system is an applied area of Artificial Intelligence. An expert system is a knowledge-based system having two main components— knowledge base and \_\_\_\_\_.
- m) \_\_\_\_\_ are destructive programs that masquerade as useful programs.
- n) A program that traverses the Web from link to link, identifying and reading pages is called \_\_\_\_\_.
- o) \_\_\_\_\_ virus infects both boot sectors and executable files, and uses both mechanisms to spread
- p) As a characteristic of computers, \_\_\_\_\_ implies that when used for a longer period of time, the computer does not get tired or fatigued.

*Diligence*

*Detrigence*

- q) In relation to computer cables, IDE stands for Integrated Device Electronics.
- r) Blu ray is an optical disc storage medium designed to supersede the DVD format.
- s) Conditions necessary for a deadlock includes Circular Wait, Hold and Wait, No-preemption and Mutual exclusion.
- t) The capacity of a conventional DVD is 4.7 GB.
- CD = 700 MB*
- Q. DES*

## QUESTION FIVE

Carefully examine the 20 statements given below. Some of them are true, others are false. Indicate which ones are true and which ones are false. Marks for each point will be awarded as +1 for correct, -1 for incorrect, and 0 for un-attempted.

- a) A *digital computer* uses distinct values to represent the data internally. All information is represented using the digits 0s and 1s. The computers we learnt in this course are digital computers.
- b) The fourth generation computers are based on *Artificial Intelligence (AI)*. They try to simulate the human way of thinking and reasoning.
- c) Fetching, decoding and executing are the three stages that make up the instruction cycle.
- d) When booting, the computer performs a Power On Self Test (POST) that checks that the software is functioning properly and the Operating System is present.
- e) Flash Disks uses a kind of semiconductor-based non-volatile, rewritable computer memory that can be electrically erased and reprogrammed. It is a specific type of EEPROM.
- f) MICR stands for Magnetic Ink Character Recognition.
- g) Ink-jet printer is an example of impact printers.
- h) Application software provides basic functionality to the computer. Application software is required for the working of computer itself. The user of computer does not need to be aware about the functioning of Application software, while using the computer.
- i) A device driver acts as a translator between the hardware and the software that uses the devices. In other words, it <sup>is</sup> hardware that intermediates between the device and the software, in order to use the device.
- j) Public Domain Software is free software. However, public domain software does not have a copyright owner or license restrictions. The source code is publicly available for anyone to use. Public domain software can be modified by the user.
- k) A *race condition* is a situation when a process waits endlessly for a resource and the requested resource is being used by another process that is waiting for some other resource.

*User APP SDI*  
*Hardware*

*DDoS* *WdS* *S.*

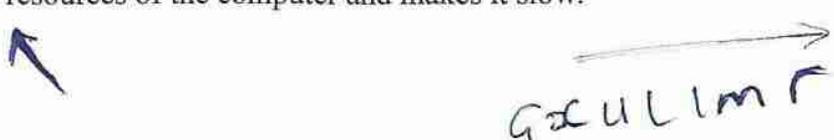
- l) Microwave transmission refers to the technique of transmitting information over a microwave link. Microwaves have a higher frequency than radio waves. They are line-of-sight.
- m) The World Wide Web (abbreviated as the Web or WWW) is a collection of linked documents or pages, stored on millions of computers and distributed across the world. Although the WWW is often referred to as the Internet, they are actually two different concepts. The Internet is one of the most popular services available on the World Wide Web.
- n) A web page is written in a language called HTML (Hypertext Makeup Language).
- o) The hyperlink is a system that provides a simple and consistent way of organizing large data (that includes text, images, pictures and videos) available on the Internet
- p) Stealth virus, unlike other viruses, consists of static virus program that gets copied from file to file as it propagates. Such virus is difficult to detect because each copy it generates, appears different from the other one. It uses encryption algorithm to multiply new copies of the program
- q) DSS provides a generalized computing and communication environment to senior managers to support strategic decisions. It provides summarized information in a convenient form to the top level managers. Unlike EIS, they are not designed to use analytical models for specific problem solving.
- r) A modem (i.e. modulator-demodulator) is a hardware, which converts analog signal into digital data (i.e. modulation) that can be sent over a digital telephone line and convert the digital data back into analog signal (i.e. demodulation)
- s) The standard protocol used for sending e-mail is called SMTP (Simple Mail Transfer Protocol). It works in conjunction with POP (Post Office Protocol) and IEAP (Internet Email Access Protocol) servers.
- t) A worm can modify a program just like a virus; it also replicates so much that it consumes the resources of the computer and makes it slow.

## QUESTION SIX

Write short notes on the following computing concepts.

- a) Cloud Computing
- b) Virtual Memory
- c) Public Key Cryptography
- d) Enterprise Resource Planning (ERP)
- e) Computer Output on Microfiche.

[4 Marks Each]

GULMIR

**COPPERBELT UNIVERSITY**  
**SCHOOL OF MATHEMATICS AND NATURAL SCIENCES**  
**INTRODUCTION TO COMPUTING (CS 110)**

**TEST 1 (JUNE, 2012)**

**INSTRUCTIONS**

**Answer all questions in the space provided – No back page will be checked. All marks add up to 100. Marks are indicated beside each question. Time allowed is 90 minutes.**

**PERSONAL DETAILS**

**GROUP:** \_\_\_\_\_ **NAME:** \_\_\_\_\_ **SID:** \_\_\_\_\_

**QUESTION ONE**

A *computer* is defined as an electronic machine that accepts data from the user, processes the data by performing calculations and operations on it, and generates the desired output results.

- a) State five (5) characteristics of a computer **[5 Marks]**
  
  
  
  
  
  
- b) The digital computers that are available nowadays vary in their sizes and types. The computers are broadly classified into four categories. What are the four categories? **[4 Marks]**
  
  
  
  
  
  
- c) In two sentences, clearly distinguish between a dumb terminal and an intelligent terminal. **[4 Marks]**

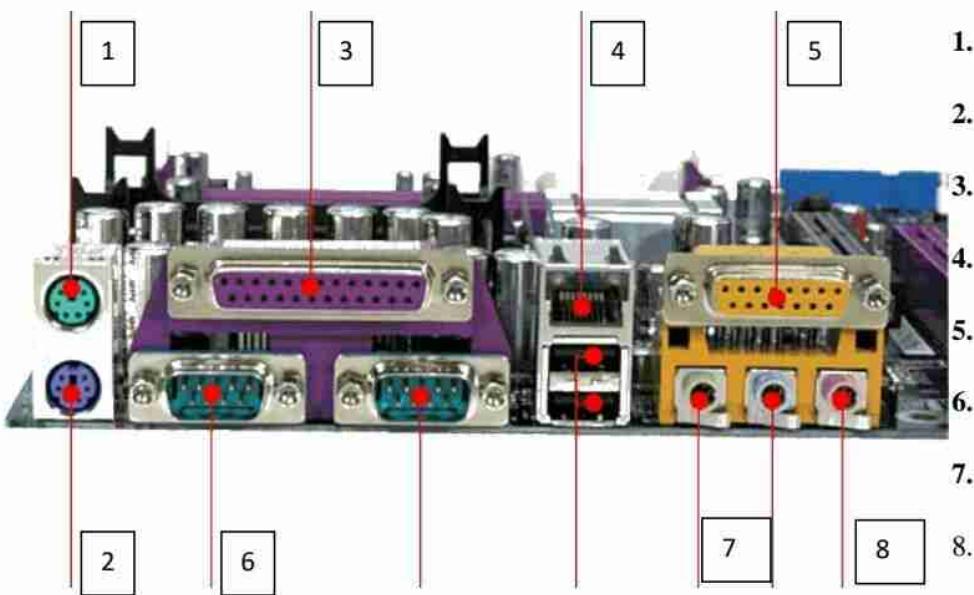
- d) Using a well labeled diagram, show the interactions between the components that make up the computer systems hardware. **[12 Marks]**

## QUESTION TWO

- a) There are a number of factors involved that are related to the CPU and have an effect on the overall speed and performance of the computer. In class, we talked about 5 of them. What are they? **[5 Marks]**

- b) What does the acronym CMOS stand for? **[2 Marks]**

- c) From the diagram given below, identify a device that can be connected to each of the labeled ports. **[10 Marks]**



- d) BIOS is the basic program used as an interface between the operating system and the motherboard. It performs a \_\_\_\_\_ that checks that the hardware is functioning properly and the hardware devices are present. BIOS also invokes the \_\_\_\_\_ to load the operating system into memory. **[4 Marks]**
- e) The processor or the CPU is the main component of the computer. What four factors do you have to look at when selecting a processor? **[4 Marks]**

### QUESTION THREE

The computer memory stores different kinds of data like input data, output data, intermediate results, etc., and the instructions. Binary digit or bit is the basic unit of memory. A bit is a single binary digit, i.e.

- a) How many bits make up
- i. 1MB \_\_\_\_\_ **[2 Mark]**
  - ii. 1TB \_\_\_\_\_ **[2 Mark]**
- b) What do you call the amount of information (in bits) that a memory can store? **[2 Marks]**
- c) Define access time. What is the relationship between access time and the speed of memory? **[3 Marks]**
- d) Imagine you want to buy a laptop computer, what reasonable specification would you look for under each one of the following components: **[10 Marks]**
- i. Processor
  - ii. RAM
  - iii. Screen size
  - iv. Hard disk
  - v. Manufacturer

- e) In relation to memory, what is used in EPROM to erase data? [2 Marks]
- f) There are different methods to format a disk. File Allocation Table (FAT) is the commonly used logical format for disk formatting performed by Windows. State four areas which are created when formatting a disk using FAT. [4 Marks]

#### **QUESTION FOUR**

- a) What are the two categories into which input devices are classified? [4 Marks]
- b) Pointing devices are used for providing the input to computer by moving the device to point to a location on computer monitor. The input data is not typed; instead, the data is entered by moving the pointing device.
- i. Other than mouse, give two more examples of pointing devices. [4 Marks]
  - ii. A Mouse can be classified as being of which two types? [4 Marks]
- c) What are the two categories into which output devices are classified? [4 Marks]
- d) Give two examples of non-impact printers and one for impact printer. [3 Marks]
- e) An image on the monitor is created by a configuration of dots, also known as pixels. The clarity of image on the computer screen depends on which three factors? Define each one of the three factors. [6 Marks]

**COPPERBELT UNIVERSITY**  
**SCHOOL OF MATHEMATICS AND NATURAL SCIENCES**  
**INTRODUCTION TO COMPUTING (CS 110)**  
**TEST 2 (SEPTEMBER, 2012)**

**INSTRUCTIONS**

*Answer all questions in the space provided. Total Mark is 100. Marks are indicated beside each question. Time allowed is 2 Hours.*

**PERSONAL DETAILS**

**GROUP:** \_\_\_\_\_ **NAME:** \_\_\_\_\_ **SID:** \_\_\_\_\_

**QUESTION ONE**

- a) List the three main components that make up a computer. [3]
  
  
  
  
  
- b) State and briefly discuss the stages that make up the instruction cycle. [8]

- c) Explain the purpose of each of the following registers [3]
- o Instruction Register
  - o Program Counter
  - o Memory Buffer Register
- d) What are the three busses that make up the system bus?[3]
- e) Explain how cache affects the performance of a computer. [3]

## **QUESTION TWO**

- a) Define software. [2]

- b) Using a diagram, illustrate the interaction between the users and computer hardware showing different levels of the software hierarchy.[3]
- c) Outline three basic functions of the operating system [3]
- d) For each of the following, write the system utility responsible for the given task. [8]
- Divide a single drive into multiple logical drives \_\_\_\_\_
  - Provides detailed information about the software installed on the computer and the hardware attached to it \_\_\_\_\_
  - Encrypt and decrypt files \_\_\_\_\_
  - Check the computer network and log events \_\_\_\_\_
- e) Clearly distinguish between public domain software and open source software. [4]

### **QUESTION THREE**

- a) In relation to networking, what do the following acronyms stand for? [3]
- DSL \_\_\_\_\_
  - ISDN \_\_\_\_\_
  - ISP \_\_\_\_\_
- b) Give any three examples of commercial ISPs in Kitwe. [3]
- c) Define e-commerce. [1]
- d) In relation to emails, what is implied by CC? How does it differ from BCC? [3]
- e) List any 6 categories of viruses [6]
- f) Give 4 examples of antivirus software. [4]

## **QUESTION FOUR**

Imagine a reputable company has called you for interviews. You are taking the challenge. Your Curriculum Vitae, so nicely polished, says that you are computer literate. The interviewers on the other hand need proof. If the following questions are the ones that are going to prove that you know just a lot about computer productivity tools, how would you answer them?

- a) List any 2 email service providers other than yahoo and Gmail. [2]
  
- b) What software application would you use to achieve each of the following? [4]
  - o Watch a movie on a computer (Other than windows media player)
  
  - o Edit an image
  
- c) Other than Internet explorer and Google Chrome, give 2 alternative web browsers? [2]
  
  
- d) If a computer literacy item in a vacancy requires 45WPM, what's implied? [2]
  
  
- e) What search engine would you use if google.com is down? [2]
  
  
- f) What is the URL for CBU's website?[2]
  
  
- g) On a computer without Microsoft office, what would you use to type a letter? [2]
  
  
- h) If an advert for a computer on sell reads “Pentium 4 inside”. What’s implied? [2]
  
  
- i) What is Wikipedia? [2 ]

## **QUESTION FIVE**

Define the following terminologies as they relate to computing; [4 Marks each]

a) Plug and Play

b) Cyber Space

c) Telnet

d) Motherboard

e) Android