Student's Name.....

Signature .....Personal Number.....

(Do not write your school, or Center Number anywhere on this booklet)

840/1
COMPUTER STUDIES
Paper 1
May/June 2019
$2^1/_2$ hours

EQUATORIAL COLLEGE - SCHOOL

Uganda Certificate of Education
COMPUTER STUDIES
Paper 1
2 hours 30 minutes

INSTRUCTIONS TO STUDENTS:

Write your names, signature, Personal Number in the spaces above.

This paper consists of **three** *Sections* **A, B** *and* **C**

Section **A** *contains* **20 compulsory** *objective type questions. The correct alternative* **A, B, C** *or* **D** *must be written in the box provided on the right hand side of each question.*

Section **B** *contains* **six compulsory** *structured questions. Answers to section* **B** **must** *be written in the spaces provided in the question paper.*

Section **C** *contains* **three** *essay questions. Answer only* **one**. *Answers to section* **C** *must be written in the answer sheet provided.*

Any additional question(s) answered will **not** *be marked.*

For Examiners' Use Only

MCQ	Q21	Q22	Q23	Q24	Q25	Q26	Q27	Q28	Q29	TOTAL

SECTION A (20 MARKS)

Answer all questions in this section

1. Development of the ..... was a breakthrough idea of a modern computer?
   A. Mark 1
   B. Babbage machine
   C. Pascaline
   D. Abacus

B

2. To accomplish, a task a computer has to process data in three stages. They are:
   A. Control unit → Processing → Output
   B. Input → ALU → Hardware
   C. Hardware → CPU → Software
   D. Input → Processing → Output

D

3. Files that are often included with an email message are often referred to as; -
   A. Data files
   B. Attachments
   C. Java scripts
   D. Cookies

B

4. Which of the following keys creates a new paragraph in word processing?
   A. Enter key
   B. F12
   C. Tab
   D. Insert

A

5. What parameter is used to specify data transfer speeds?
   A. dpi
   B. bps
   C. ppm
   D. mhz

B

6. How can the risk of unauthorized computer system access in the computer laboratory be reduced?
   A. Installing anti-spam software
   B. Using firewalls
   C. Setting up a WAN
   D. Encrypting data stored in a system

B

7. All computers must have: -
   A. Word processing software
   B. An operating system
   C. A printer attached
   D. A virus checking program

B

8. A computer port is used to
   A. Communicate with other computer peripherals
   B. Download files from the web
   C. Communicate with all hard drives
   D. Serve as interface between computer and peripherals

D

9. To "debug" the system means to
   A. clean it.
   B. find and correct errors.
   C. decode it.
   D. set up icons.

B

10. Identify the odd one out?
   A. Floppy disk
   B. Zip disk
   C. Optical disk
   D. Jaz disk

C

11. How many CD'S700MB capacity are needed to transfer data from a hard disk of 2GB for purposes of data backup.
   A. 2
   B. 3
   C. 4
   D. 1

B

12. What is the meaning of the term range as used in spreadsheets?
   A. Intersection of rows and columns
   B. a reference to a particular cell
   C. a group of adjacent cells
   D. a collection of worksheets

C

13. All files ending with the following extensions are executable except……
   A. .bat
   B. .com
   C. .exe
   D. .doc

D

14. A private network protected from public visits by a firewall is called…
   A. Internet.
   B. Intranet.
   C. Email.
   D. Usenet.

B

15. Which of the following statements are correct?
    i) Each web browser has a unique IP address
    ii) HTTP is a communication protocol
    iii) An internet domain may be referred to as HTML
    iv) The internet is a network of networks

    A. I & II only
    B. I, II & III only
    C. II & IV only
    D. II, III & IV only

C

16. An area of artificial intelligence that simulates certain experiences using headgear, gloves and software that translates data into images is……

    A. Collaborative technology
    B. virtual reality
    C. hypermedia
    D. shell

B

17. A system program that combines separately compiled modules of a program into a form suitable for execution is called?

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

B

18. The basic use of a primary key in a database is to;

    A. uniquely identify a record.
    B. act as an alternative identifier.
    C. sort records.
    D. modify a file Structure.

A

19. A (n) ……., which is used almost exclusively by banking industry, can read text printed with magnetic ink.

    A. Bar code scanner
    B. Optional character recognition reader (OCR)
    C. Optional mark recognition reader (OMR)
    D. Magnetic-ink character recognition character recognition Reader (MICR)

D

20. Exclusive rights given to software authors/developers to produce, duplicate and sell their software is referred to as ……..

    A. Intellectual Property
    B. Copyright
    C. Trade mark
    D. Memoranda

B

SECTION B (60 MARKS)

21. (a) Define the following as used in computer studies. (02 marks)

a) Bit.

Bit –smallest unit of information in a digital computer system.

b) Word length.

Word length –is the member of bits which can be communicated in the internal component of a computer. This is the member of bits in a word.

(b) i) Give **two** reasons why computers use binary codes (02 marks)

- **They are bi-slate devices (they can only hold dates in binary codes/forms)**
- **Easier to develop devices using binary codes.**
- **Binary codes enables storage of data in different forms,**
- **Best for storage of large amount of data in a smaller space.**

ii) Differentiate between **a Nibble** and **a byte** (02 marks)

- **Nibble is a four bit word whereas a byte is an eight bit word.**
- **Two Nibbles make a byte.**
- **Half a byte is equivalent to one nibble.**

(c) Convert: -

i) 1110101_2 to decimal . (02 marks)

$= (1\times2^6)+(2\times2^5)+(1\times2^4)\times(0\times2^3)+(1\times2^2)+(0\times2^1)+(1\times2^0)$

$= 64+32+16+4+1)$

$= \underline{117_{10}}$

ii) 1001_{10} to binary. (02 marks)

$100\frac{1}{2} = 500$ R . 1

$\frac{500}{2} = 250$ R 0

$\frac{250}{2} = 125$ R 0

$\frac{125}{2} = 62$ R 1

$\frac{62}{2} = 31$ R 0

$\frac{31}{2} = 15$ R 1

$\frac{15}{2} = 07$ R 1

$\frac{7}{2} = 3$ R 1

$\frac{3}{2} = 1$ R 1

$\frac{1}{2} = 0$ R 1

$= \underline{1111101001_2}$

22. (a) Define the term '**Booting**'. (01 mark)

Is the process of starting up a computer and loading the operating system into memory of a computer until the screen which is the desktop is displayed.

(b) Mention any **four** cases in which a warm boot may be necessary. (02marks)

- **When an application or operating system freezes/hangs/ does not respond**
- **After installation of a new software (application or utility)**
- **When a peripheral or hardware component has failed to function/work**
- **During/After installation of operating system.**
- **After changing use control settings(CMOS/BIOS settings)**
- **When a user wants to clear a malicious infection like malware, spyware, viruses that are in memory**
- **After software update**
- **After malware/virus scanning**
- **Before Installing software**
- **After installing a new hardware**
- **After uninstalling software**
- **When the computer system slows down**
- **After uninstalling hardware**
- **When a user wishes to switch from one operating system to another (Multiple O.S)**
- **When application software fails to work** ***Any 4x $^1/_2$ =*** **(02marks)**

(c) The following are the steps involved in the boot process. Arrange them in order from the first to the last: (04 marks)

- The processor finds the ROM chip that contains the BIOS
- A series of messages may be displayed on the screen.
- A User switches power on.
- The BIOS performs the POST.
- The power supply sends signals to the system unit components.
- The BIOS loads of the Operating System from the Hard Disk to RAM.
- The Operating System displays the welcome screen.
- The results of the POST are compared with data in a CMOS chip.

CORRECT ORDER OF THE STEPS INVOLVED IN THE BOOT PROCESS:

1. ***A user switches power on***
2. ***The power supply sends signals to the system unit components***
3. ***The processor finds the ROM Chip that contains the BIOS***
4. ***The BIOS performs the POST***
5. ***A series of messages may be displayed on the screen***
6. ***The results of the POST are compared with Data in a CMOS Chip***
7. ***The BIOS loads the Operating System from the Hard Disk to RAM***
8. ***The Operating System displays a welcome screen***

(d) Write the following acronyms in full: (*03marks*)

(i) **BASIC: Beginners All Purpose Symbolic Instruction Code**
(ii) **POST: Power On Self-Test**
(iii) **CMOS: Complementary Metal Oxide Semi - Conductor**

23. (a) Explain the meaning of the following terms in relation to computer programming.

i) Source program. (03 marks)

Source program; is the initial code that the programmer enters in the program editor window.

ii) An object code.

An object code; is a program code that is already translated in to machine readeable form.

iii) A translator.

A translation; is a utility program that converts a souce code into an object code.

(b) Give **two** ways how interpreted program is different from compiled program.

(04 marks)

- **Interpreted**	- **Compiled program**
- **slower**	- **Faster**
- **Occupies less space.**	- **Occupies more space.**
- **Higer likelyhood of errors (as they are only realised when line is translated).**	- **Low likehood of errors (as most there arrested at the compiling stage)**

(c) List **three** stages of a program development. (03 marks)

- **Problem recognition.**
- **Program design.**
- **Program lesting and debugging.**
- **Program implementation and maintance.**
- **Problem defination.**
- **Program code.**

24. a) (i) Explain the **<u>function</u>** of the following in data communication. (02 marks)

i). Bridge.

- **Reduces the amount of traffic in LAN (by dividing data into segments and filtering)**
- **Combins signals using similar protocols for transmison.**

ii). Gateway.

- **Allows access from one network to another (e.g. LAN to WAN).**
- **Combines signal using different protocols for transmission.**

(b) (i) Name **three** types of cables used in data communication. (03 marks)

- **Twisted pair cables.**
- **Coaxial cables.**
- **Fibre optic cables.**

(ii) State **three** advantages and **two** disadvantages of using fibre optic cables for data communication

Advantages; (03 marks)

- **More economic for long distance transmission.**
- **It has large bandwidth.**
- **Suffers low attenuation.**
- **Fast in data transmission.**
- **It is secure, (resistant to tapping).**
- **It's immune to electromagnetic and electrical interference.**
- **They do not emit electrical signals since they use light in data transmission.**

Disadvantages (02 marks)

- **Expensive over short distance.**
- **Difficult to install and configure.**
- **Easily break because they are glass in nature.**
- **Ends should be highly polished to allow light to pass with little loss.**

25. (a) A hospital would like to use a relational database to keep track of its patients. Give **four** different tables that may be included in this database. (04 marks)

(i) **Patient details table.**
(ii) **Doctors' details table.**
(iii) **Drug details table.**
(iv) **Illness details table.**
(v) **Perception table.**

(b) List down **three** advantages that will result from using the database. (03 marks)

(i) **Easy update of patients' records.**
(ii) **Easy access of patients' history.**
(iii) **Quick retrievals of doctors' record or treatment.**
(iv) **Patient at risk easily identified (by routine database procedures that automatically flag unit this patient).**

(c) Identify at least any **three** examples of web authoring software programs. (03 marks)

- **Microsoft Expression Web**
- **Microsoft front page**
- **Macromedia Dream weaver**
- **Note pad or Note pad ++**

26. (a) (i) Define the term **artificial intelligence** as used in ICT. (01 mark)

- ✓ **Is a branch of computer science that deals with the development of artifacts with the ability to perform same functions like humans.**
- ✓ **This is a computer science that is focused on creating computer systems that simulate human intelligence.**
- ✓ **Is the ability of the computer to respond to instructions like humans.**

(ii) List **four** main application areas of artificial intelligence. (04 marks)

- **Expert system.**
- **Natural language processing.**
- **Robotics/ perception system.**
- **Artificial neural networks.**
- **Game Playing**

(b) (i) Mention **three** ways in which a computer can help a doctor during Consultation with a patient. (03 marks)

- **Storage of data.**
- **Determined the temperature.**
- **Online consultation.**
- **Communication.**

(ii). Give **two** advantages of using computers to monitor the health conditions of patients in a hospital instead of using nurses. (02 marks)

- **Computer give more accurate results as compared to nurses**
- **Computers can monitor the patient without getting tired or bored which is not the case with nurses**
- **Computers give results / feedback about the patient's status more quickly hence more quicker attention is given to a patient.**
- **Computers go an extra mile of storing information about different patients which can be used for follow up purposes.**
- **Computers can monitor a patient 24hours which may not due to human limitations.**

SECTION C (20 MARKS)

*Answer only **one** question from this section. Answers to this question **must** be written in the answer sheets provided.*

2 (a) The help of a laboratory technician can give when the following error messages appear.

(i) Non-system disk error when the computer system is switched on

- He would eject the disk from the drive press any key on the keyboard to enable the boot process to continue
- Restart the computer
- Check hardware connection
- Reformat the hard disk

(ii) Low disk space and computer is slow

- He can fix this by deleting some files or using disk cleaner utility
- He can close some files which are open and that would be occupying the Ram
- Back up and delete from computer
- Use of cloud computing
- Increase the Ram
- Defragmenting the hard disk
- File compression
- Run anti-virus to scan the device
- Increase/slave/add new Hard Disk Drive (HDD)

(iii) Access denied when a user wants to access a particular file

- Exit or stop programs that are running and could be blocking the users' tasks from running
- Install and run the anti-virus
- Adjust users setting to allow access
- Provide password
- Adjust windows firewall and allow access

(iv) Out of memory

- Exit or stop programs that are running and could be blocking the user's tasks from running
- Install or upgrade the Ram by buying another Ram chip and fixing it on the memory slot of the mother board and restarting the computer to implement the upgrade
- Run a virus scan
- Restart the system

(v) Device not ready

- Disable particular disk drive from the device manager
- Give it time to activate
- Re-install drivers
- Check and change power connection points e.g. USB
- Restart the device
- Re-install the Operating system
- Scan for viruses/malware
- Uninstall and or deactivate software blocking the hardware by Deep freeze
- Changes ports where applicable
- Disable and enable the device

(b) Reasons why Annitah's laptop started to slow down

- Not enough Ram
- Virus attack or malware infection because of connection to the internet
- Low disk space due to many programs stored
- Some system files being corrupted
- When there is any scanning program runs in the background eg anti-virus
- When files on the disk are fragmented and access time is reduced
- Automatic updates
- Wear and tear

28. Ainebyoona was assigned a task by the computer teacher to develop a program that computes the radius of a circle whose area is to be entered by the user using either C or VB language.

Assist Ainebyoona to write a working program according to the task assigned to him by the teacher. In your preparations, Use a flow chart, write a structured algorithm and finally a code to be used. *(20 marks)*

Solution algorithm

START **[1]**
Set π to 3.14 **[1]**
Prompt the user for the Area **[1]**
Store the Area **[1]**
Set Radius to Sqrt(Area) / * Sqrt (π) **[1]**
PRINT Radius **[1]**
STOP **[1]**

Total (07 marks)

VB Code

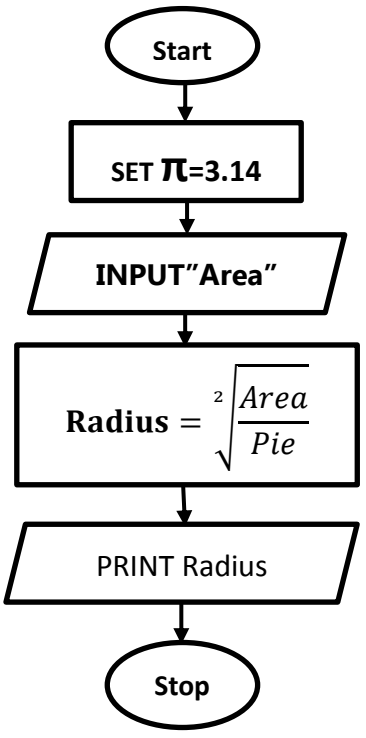
```
Private sub commandButton1_Click()

Dim Area, Pie, Radius As Integer          [1]
Pie = 3.14                                [1]
Area = Val(InputBox("Enter Area"))        [1]
Radius = Math.Sqrt(Area) / Math.Sqrt(Pie)[2]
MsgBox("Radius is:" & Radius)             [1]

End Sub
```

Total (06 marks)

FLOW CHART



[1] **[1]** **[1]** **[2]** **[1]** **[1]**

Total (07 marks)

29. (a) With the use of **illustrations** explain the data transmission modes.

(04 marks)

A duplex communication system is a point-to-point system composed of two connected parties or devices that can communicate with one another in both directions. **An example of a duplex device is a telephone.**

A full-duplex (FDX) system, sometimes called double-duplex, allows communication in both directions simultaneously. **E.g. Land-line and Cell telephone networks** are full-duplex, since they allow both callers to speak and be heard at the same time.

A half-duplex (HDX) system provides communication in both directions, but only one direction at a time (not simultaneously). Once a party begins receiving a signal, it must wait for the transmitter to stop transmitting, before replying (antennas are of trans-receiver type in these devices, so as to transmit and receive the signal as well). **An example of a half-duplex system is a two-party system such as a walkie-talkie.**

Simplex is a communication that occurs in only one direction. **For example, Radio and Television broadcast, communication between a mouse and computer**

(b) Describe the procedure for connecting a computer to an active wireless network

(08 marks)

- **Click network icon on the right hand side on the task bar.**
- **Select the network you want to connect to from available list.**
- **Type password if the network is protected or if connecting for the first time.**

(c) Explain the process of networking ***three*** or more network computers in a single Building *(08 marks)*

- **Have network cables well terminated.**
- **Prepare a network switch or hubs/router RJ45.**
- **Connect the cables to the computer through the RJ45 port.**
- **Connect all Ethernet cables to the switch or hub/Router.**
- **Configure IP address on every computer.**
- **Add a work group name for the network.**

END