

FORM FOUR**COMPUTER STUDIES****MARKING SCHEME****SECTION A (40 marks)**

Answer all questions in this section in the spaces provided.

1.(a) Headache, back and neck pain may result from use of computers. Explain two ways in which back and neck pain can be minimized. (2mks)

- ✓ ***Use of standard furniture***
- ✓ ***Sit to have upright backrest.***
- ✓ ***Furniture should be high enough to enable eyes of the user to be level with the top of screen***

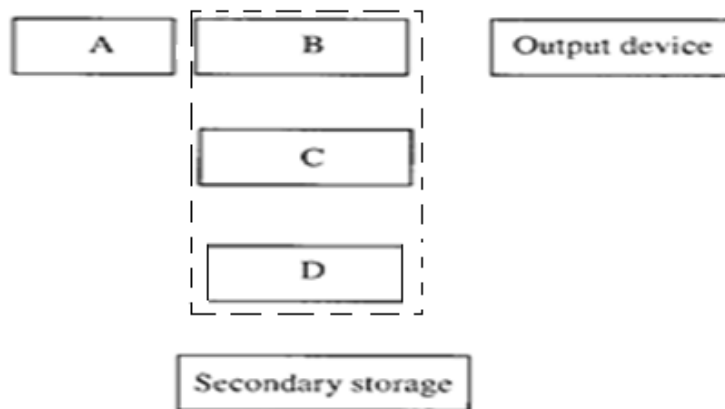
(b) State how computer have been made more users friendly for persons that are:

(i) Blind..... (1/2 mk)

(ii) Without hands..... (1/2 mk)

- ✓ **Blind - Use of braille keyboard (1/2mk)**
- ✓ **Without hands - use of microphone/speech recognition devices (1/2mk)**

2. The diagram below represents the essential features of a computer system. Study the diagram and answer the questions that follow:



(a) (i) Name and describe the following components (4mks)

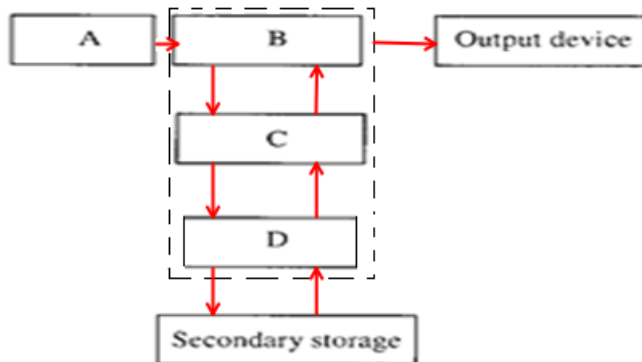
A- Input device- used to enter data into the computer

B- Control unit -Manages and coordinates activities of the computer system.

C- ALU-Perform arithmetic and logical operations on data during data processing

D –Primary memory/main memory this includes the RAM and special type memories registers and cache memory. Store data and instructions that are directly accessible and required for data processing. Store intermediate results during data processing

(ii) On the diagram above, indicate the direction of data flow using arrows (1mks)



3. Anestar High School intends to purchase new computer to be used by students in the e-learning room for accessing digital learning resources and personal research. Advise the school on two computer hardware system specification features to consider as a measure of enhancing performance of the computers. (2mk)

- ✓ **Consider hard disk capacity**
- ✓ **Consider RAM capacity**
- ✓ **Consider processor/computer speed**

4. State two items that an electronic mail should have for it to be sent. (2mk)

- ✓ **Receiver email**
- ✓ **Email Subject**
- ✓ **Message**

5. A worker is unable to travel to the office but may still be able to do the office work through telecommuting.

(a) Explain why the worker may use each of the following:

- ✓ **Email (1mks)**
- ✓ **Fax (1mks)**
- ✓ **Firewall (1mks)**
- ✓ **Digital camera (1mks)**

i. Email (1mks) **to send and receive messages**

ii. Fax (1mks)

- ✓ **To send and receive scanned text and images**

iii. Firewall (1mks)

- ✓ **To prevent unauthorized access to or from a private network**

iv. Digital camera (1mks)

- ✓ **To record videos and take photos**

6. Explain the term search engine as used in the Internet. (2 mks)

- ✓ **A program that searches for and identifies items in a database that correspond to keywords or characters specified by the user, used especially for finding particular sites on the World Wide Web.**

7 (a) Explain two ways in which an operating system provides data security in a computer system (2mks)

- ✓ **Provides user access level interface where the user must provide login details before access.**
- ✓ **Has built in firewall software to deter unauthorized access from a private network.**
- ✓ **Has log files that keeps track of all activities as they happen.**
- ✓ **Has disk utility software that automatically runs when the computer is booting to repair any damages and recover lost data from the harddisk due to un-procedural shut down.**
- ✓ **Has screen security systems such as a screen saver that automatically locks the computer if idle for a given period of time. This requires the user to access by proving login details.**
- ✓ **Has a feature that allows the user to hide private and confidential files or even guard them with passwords.**

8. File conversion, in system development, refers to modifying or changing the format of files when a new system is introduced e.g. from manual to computerized. State any THREE factors considered before the file conversion process. (3mks)

(i) Whether the new system requires a new operating system and/or hardware.

(ii) Whether you need to create new database files for the new system e.g. manual to electronic files.

(iii) Whether you need to install new application software.

9. A student saved a document in a diskette. Later on, the student found that the diskette could not open and therefore the work got lost. Give three precautions the student should have taken to ensure the work was not lost. (3mks)

- ✓ **Eject the diskette in the right procedure**
- ✓ **Ensure that the computer is free from malware**
- ✓ **Format the disk before saving**

- ✓ **Ensure that the diskette is not in write protective mode.**
- ✓ **Avoid dust.**
- ✓ **Do not expose the disk to sunlight and strong magnetic fields**
- ✓ **Store the disk in a dry clean place.**

10. A video rental shop uses a computerized system to record which videos have been loaned out. When a video is loaned out, the customers' data is recorded on computer file. Describe TWO computer processing files that will be needed to store permanent customer records and temporary records that keep on changing. (4mks)

- ✓ **Master files**

Contains all the permanent data/records you keep about something e.g. videos, which transactions are processed.

- ✓ **Transaction files**

Contains data about what has happened. These are files that contain input and output data for holding temporary incoming or outgoing data. Used to update dynamic data on master files.

11. Define overflow error with respect to computation of data (1mk)

- ✓ **This error type will usually happen on older machines whose memory capacity is overshadowed by the capacity of the result of calculations.**
- ✓ **When a number is too big, it is rounded off or truncated. The rounded off value leads to overflow errors.**

12. What role is played by a reference file in data processing? (1mk)

- ✓ **For look-up purposes. Look up information is stored in a separate file but is required during processing.**

13. State one instance where batch processing could be applied (1mk)

- ✓ **Processing of payroll**
- ✓ **During manufacturing processes**
- ✓ **Processing of examination results and analysis**
- ✓ **Electricity and water billing system.**
- ✓ **Statistical processes such as censures and voting.**

14. State three merits of distributed data processing modes. (3mks)

- ✓ **Fast in processing**
- ✓ **Data is more secure**
- ✓ **Programs and files are shared hence cheaper.**

15. State any TWO advantages of using computers in computer aided design (CAD) (2mks)

- ✓ *Easy to store and retrieve drawings.*
- ✓ *Easy to make changes*
- ✓ *Easy to test since most packages come with features for testing designs.*
- ✓ *Saves on costs since models can be used to draw construction schedules.*
- ✓ *Stored design can be used to produce control instructions for machines which will make the product.*
- ✓ *Quick production of drawings and plans.*

SECTION B (60 marks)

Answer question 16 and any other THREE questions from this section in the spaces provided.

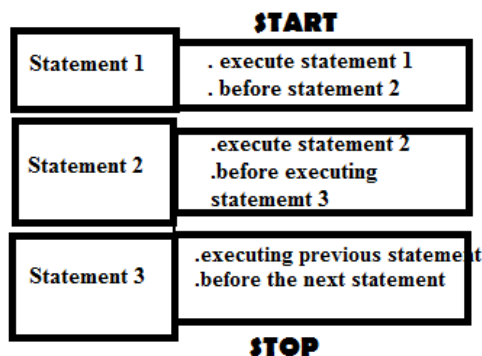
16. a) State two qualities of a good pseudocode. (2 marks)

- ✓ *The statement must be short, clear and readable*
- ✓ *The statements must not have more than one meaning i.e. should be unambiguous*
- ✓ *The pseudo code lines should be clearly outlined and indented clearly*
- ✓ *A pseudo code should show clearly the start and stop of executable statements and the control structures (to be discussed later in the section)*
- ✓ *The input, output and processing statements should be clearly stated, using keywords such as*
Input: READ, OBTAIN, GET
Output: PRINT, DISPLAY, SHOW
Compute: COMPUTE, CALCULATE, DETERMINE
Initialize: SET, INIT
Add one: INCREMENT, BUMP

b) With the aid of flowchart diagrams, describe each of the following programme control structures:

(i) Sequence

- *In this structure, the computer reads instructions from a program file starting from the first top line and proceeding downwards one -by -one to the end. This is called sequential programming execution i.e. Sequence control structure.*



(ii) Selection

In selection control, execution of statements depends on a condition which is either a true or false

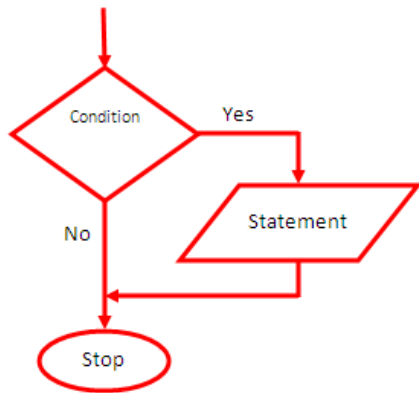
There are four types of selection controls. Namely:

IF.....THEN

IF.....THEN.....ELSE

NESTED IF

CASE SECTION



Format:

IF <condition> THEN

Statements;

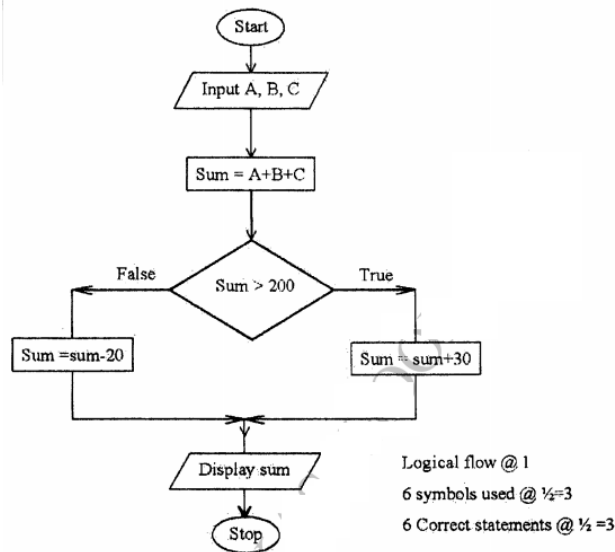
ENDIF

Picture

C. Draw a programme flowchart that would accept three numbers and find their sum . If the sum is greater than 200, it adds 30 to the sum, otherwise subtracts 20 from the sum. The programme should then display the results. (5 marks)

Draw a programme flowchart that would accept three numbers and find their sum

c) The flow chart



17. A) (i) what is a Blog in relation to internet services (2marks)

- ✓ ***It is an internet site where a person can regularly post personal information, music, movies and diaries and socially interact with people connected to the same.***

(ii) Explain the impact of the internet in the information security (2 marks)

- ✓ ***Private and confidential information is constantly at risk from hackers, crackers and fraudsters who carry out their trade on the internet.***

(b) Kunta would like to send photos to Kinte via e-mail. Outline the steps Kunta would follow to send the photos as file attachments (3marks)

- ✓ ***Launch the e-mail program such as gmail, yahoomail, etc***
- ✓ ***Click New or Compose to create a new e-mail.***
- ✓ ***Click the file attachment button.***
- ✓ ***Locate the photos to attach and click attach.***
- ✓ ***Click the send button.***

Any other appropriate procedure is allowed. One mark based any of the bolded keywords in logical order.

(c) Differentiate between the following in relation to data security and control (4 marks)

(i) Password and biometric authentication.

- ***Password is an encoded string of characters that enables a person to be positively identified before being given access while,***

- **Biometric authentication relies on a unique aspect of human features like finger prints, iris or arrangement of facial features. It is one of the most secure authentication mechanisms because no two people can have the same features.**

(ii) Privacy and Confidentiality.

- **Privacy refers to an individual's right to control access to data or information belonging to himself or herself.**
- **Confidentiality refers to the means of protecting private or corporate data or information from unauthorized access or disclosure.**

(d) Computer crimes include Trespass, Hacking, Piracy and Sabotage. Highlight each of them. (4 marks)

- **Trespass means the unauthorized physical access to ICT assets or also accessing information digitally without permission.**
- **Hacking is the forceful access to information held in computers by breaking access control codes like passwords.**
- **Piracy is a form of intellectual property theft which means illegal copying of software, information or data.**
- **Sabotage is the illegal destruction of data and information with the aim of crippling service delivery or causing great loss to an organization.**

18. (a) (i) State two reasons for data representation in a computer (2 Marks)

- **It is easier to construct electrical circuits based on binary. (on/off logic)**
- **Digital devices are small in size thus use less energy**
- **Digital devices are more reliable**

(ii) Define the following words as used in data representation in a computer (4 Marks)

a) Nibble

- **A nibble is a group of 4-bits or half a byte**

b) Word

- **This is a group of bytes**

c) Byte

- **This is a group of bits preferably 8**

d) Bit

- **It is the smallest unit of digital information which is either a zero or a 1**

(iii) (a) Convert 34_{10} to its binary equivalent. (2 Marks)

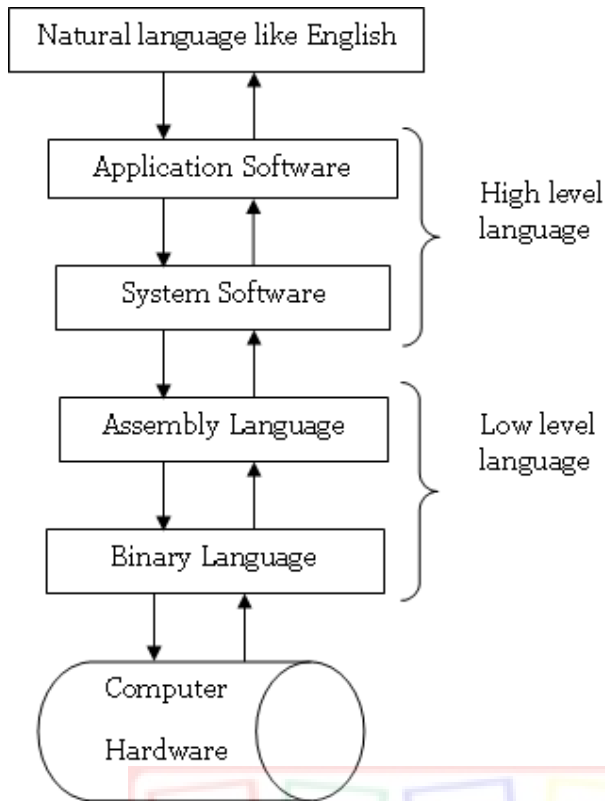
Divider	Divisor	Mod
2	34_{10}	
2	17	0
2	8	1
2	4	0
2	2	0
2	1	0
	0	1
$=100010_2$		

(b) Convert 1001011_2 into decimal number system equivalent (2 marks)

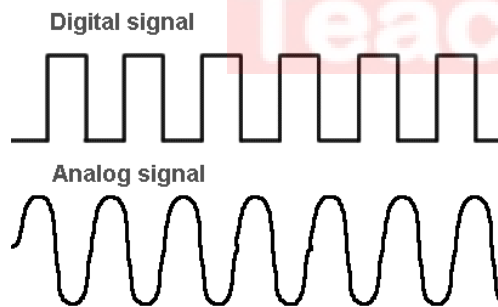
1001011_2							
1	0	0	1	0	1	1	Absolute value
2^6	2^5	2^4	2^3	2^2	2^1	2^0	Place value
$2^6 \times 1$	$2^5 \times 0$	$2^4 \times 0$	$2^3 \times 1$	$2^2 \times 0$	$2^1 \times 1$	$2^0 \times 1$	Method
64	0	0	8	0	2	1	output
$64 + 8 + 2 + 1 = 75_{10}$							

iv. (a) Briefly explain how data is represented in a computer (3 marks)

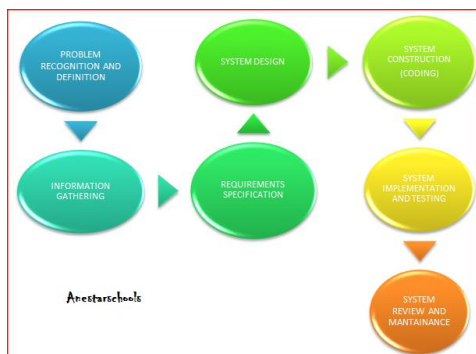
- **Computer doesn't understand neither do they process natural languages. They convert natural languages such as English; into the language they understand (Binary).**
- **Binary systems are made up of 0s and 1s and they are the easiest to manipulate and store in a digital environment.**
- **All storage and processing systems are formatted in binary nature to help computers interpret them.**
- **Platforms that data must go through to communicate with hardware**



(ii) With the aid of a well labelled diagram, distinguish between analogue and digital signals (2 marks)



19) (i) With the aid of a diagram, describe seven stages in system development life cycle (SDLC) in their logical sequence (7 marks)



Problem recognition and definition

- *This is finding out whether the proposed system is worth looking at or pursuing. This is done by looking at the problem at hand and how the proposed system will find solutions to the problem.*

Information gathering

- *At this phase./stage relevant information is gathered using various means. This information shall be used to design the proposed system.*

Requirement specifications

- *All hardware and software considerations are assessed here also processing specifications, output/input specifications, file and data stores.*

System design

- *This stage involves using symbols and algorithms to come up with a structure of the new system. Data flow diagrams, flowcharts, pseudocode, tables, queries, forms and reports are designed here.*

System construction

- *This involves use of a programming language or a database [DBMS] to build a system that was designed under system design.*

System implementation and testing

- *This is installing and testing the new system for the first time. Sample data is used to detect errors and correct them.*

System review and maintenance

- *This is trying check for any challenges they system may pose in future and troubleshooting any errors. Also finding out the desired output.*

(ii) (a) What is a closed system?(1mark)

- ***This is a system that receives input but does not necessarily give the output.***
- ***The borders of a closed system are not clearly defined***

(iii) State four roles played by an information system. (4 marks)

- ***Supporting information processing ~ by enhancing tasks such as data collection, processing and communication***
- ***Helping in decision making ~ by collecting operational data, analyzing it and generating reports that can be used to support the decision making processing***

- **Enable sharing of information**
- **To plan and control the activities of the firm**

20) (a) (i) State any four factors you would consider before installing an operating system. (4 marks)

- **Hardware considerations such as memory, processor speed, make and harddisk space**
- **user needs**
- **Initial cost**
- **warranty / end user licensing agreement**
- **compatibility and upgradeability**
- **user friendliness**
- **Online support**
- **Accessibility**
- **Security of data**
- **Multimedia capabilities.**

(ii) (1) State two reasons that causes computers to hang (2 marks)

- **Computer virus**
- **Less memory**
- **Opening too many programs at a go (multi-tasking)**
- **Anti-malware/operating system updating behind the scenes**
- **Too many requests to your computer from a local area network**

(2) State solutions to the causes you listed 19. (ii) (1) above (2 marks)

- **Install anti-malware**
- **Upgrade memory**
- **Turn on auto updates only when the computer is idle**
- **Avoid batch processing**

(c) In relation to operating system, differentiate between Kernel and Shell. (2 marks)

- **A kernel is the central part of an operating system. It manages the operations of the computer and the hardware, most notably memory and CPU time.**
- **A shell is a computer program which exposes an operating system's services to a human user or other program.**

(d) State any two characteristics of a computer file. (2 marks)

- **Has properties such as size, date made and type of application it was made of.**
- **Has an extension**
- **has a unique name**

(e) Mobile Operating System (OS) is software that allows Smart phones, Tablet PCs and other devices to run applications and programs. List any THREE examples of Mobile Operating Systems (3 marks)

- ***Android***
- ***Sailfish OS***
- ***iOS***
- ***Chrome OS***
- ***EMUI***
- ***Experia UI***
- ***Color OS***
- ***Copperhead OS***
- ***Fire OS***
- ***Windows 8***

