451/1

COMPUTER STUDIES

PAPER 1

(THEORY)

END OF TERM 2- 2026

FORM 4

TIME: 2 ½ HRS

SECTION A (40MKS)

ANSWER ALL THE QUESTIONS

1. Mr. Ombati computer technician in one of the schools used speech method to store students oral answers to an exam into a computer
   a) What is a speech input? (1Mk)
   It is a type of input where a microphone connected to a computer system is used to enter data in form of spoken words into the computer
   b) State one advantage and one disadvantage of using this kind of input.
   (2Mks) i) Advantages
   - Voice input is fast
   - Its suitable for people with special needs especially those with impaired hands
   - Can be used in emergency situations ii) Disadvantages
   Voice inputis complex to develop
   - Voice input does not take care speech related problems such as accents, tone etc
   - The response rates of speech input devices are relatively slow
   - Most speech input devices can recognize a limited, standard vocabulary of spoken words, and the voice of only one speaker
   - Cannot differentiate words that have same sounds (homophones)

2. Last year 2020 when corona virus was declared a pandemic internationally most companies allowed employees to telework or work at home and communicate with the office using the Internet. List the hardware, software and services required to access and use the Internet.
   (3 Marks)

- Data terminal
- Transmission media
- Internet service providers
- Internet s/w

3. Ventilation is an important practice in the computer lab because it enhances proper circulation of air. Outline three ways in which air is regulated in the computer room.
   (3 marks)

- Avoiding overcrowding of either machines or users in the room

- Ensuring that the room has enough ventilation points like windows
- Installing air conditioners

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

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

5. (a)Define the term artificial intelligence (1mk)

The ability of a computer to imitate a human being

(b)State any two advantages of the artificial intelligence. (2 Marks) -

- Reduction in Human Error
- Helping in Repetitive Jobs
- AI machines have no emotions
- Round-the-clock availability

6. a). Explain the following features as used in word processing.

i). Word wrap (1mk)

Word wrap is a feature which enables text to automatically flow to the next line if the end of the current one is reached

ii). Thesaurus (1mk)

Thesaurus is a feature used to find synonymns and antonymns

7. Name the two types of desktop publishing software. (2mks)

Graphical based Layout based

8. Distinguish between tracking and kerning as used in DTP. (2mks)

Tracking refers to visual closeness or denseness of characters in a word while kerning refers to the art of fixing particular pairs of letters that are too close or too far from each other in word or sentence.

9. State the importance of the following terminologies as used in database. (1mks) (i) Enforcing Referential integrity

To ensure that all records entered in the related table exist in the primary table.

(ii) Validation rule

Restricts the values to be entered in a field

10. Mention one ICT jobs that a college graduate can get in the video rental shop with regard to records management. (1mk)

- Database administrator
- Data control clerk

11. List THREE things which accompany newly purchased software. (3mks)

- License agreement
- Warranty
- User manual
- Reference guide
- Quick reference guide

12. (a)Give two application areas of each of the following scanning devices.

(i) Optical mark reader (2mks)

- Marking multiple choice exam
- Analyzing structured questionnaire
- Payroll data entry
- Traffic survey

(ii)Magnetic stripe recognition .card (2 mks)

- Used on credit cards
- Bank cards(ATM)
- As tags on clothes
- Access control systems

13. Describe THREE ways in which computers are used as industrial systems. (3mks)

-CAD / CAM – For designing & manufacturing products

-Process control – To monitor and control working of processes in manufacturing plants.

-Simulation – To enable experimentation to take place with the use models

(Award ½ for each listed)(Award 1 for each correct explanation)

14. The manager of a company wants to improve the security of the computer network. She has decided to use authentication techniques so that employees can identify themselves to the system. Name two authentication techniques and describe how each technique would help keep the data more secure. (3mks)

- Use of biometric methods ie finger prints
- smart cards or hand-held tokens
- password or a simple personal identification number (PIN)

15. (i)The first column in the table below contains the formula stored in cell C10 of a spreadsheet. Enter the formulae as they would appear when copied to cell F15 of the same spreadsheet. (3mks)

FORMULA IN C10	FORMULA IN F15
=A5 * B5	=D10 *E10
=A & 5	=D&5
=4 *B&6	=4 *E&6

ii) What are the differences between Token ring topology and Ethernet topology? (1Marks)

Ethernet topology all computers listens to the network media and can only send data when none of the others is sending. While in token ring a special package for data called a token goes around the network and only the computer whose address is on the data held in the token will take up the token and releases it after reading the data.

SECTION B(answer question 16 and any other three)(60mks)

16. (a) With the aid of an example in each case describe the following types of maintenance.

(i) Adaptive (2mks)

Type of maintainance that is done to make the system to adopt to the changing technology e.g changing the system because of a new operating system

(ii) Perfective (2mks)

Type of maintaince done to make the system better in its operation e.g adding a module in a system

(iii) Corrective. (2mks)

Type of maintainace done to correct an error in the system. E.g wrong results during addition

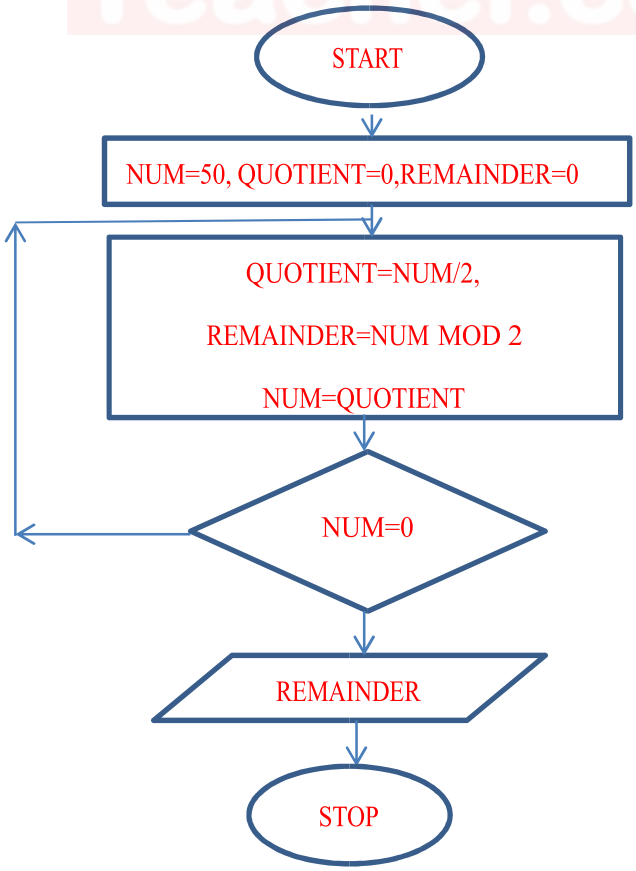
(b)(i) Give the output of the pseudcode below showing the working clearly. (4mks)

```
BEGIN
    Set Num=50, Quotient=0, Remainder=0
    Repeat
        Quotient=Num / 2
        Remainder= Num MOD 2
        PRINT  Remainder
        Num=Quitient
    UNTIL Num=0
    PRINT Read remainder upwards.
END.
```

ANS:1100100

NUM	QUOTIENT	REMAINDER
50	0	0
25	25	0
12	12	1
6	6	0
3	3	0
1	1	1
0	0	1

(ii) draw a flowchart for the pseudocode in question 16b(1) above. (5mks)



17. (a) (i) Define the term network protocol (1 Mark)

- Set of rules and procedures that govern how computers and related devices communicate and transfer data signals

(ii) Name any two examples of network protocols (2 Mk) o

TCP/IP o FTP

(b) State any two methods used to gain unauthorized access to a computer system. (2 mks)

- by using weak access points
- through hacking

(c) (i) Distinguish between physical and logical topology (2mks)

Refers to physical arrangement of computers and other devices on the network while logical deal with the way data is transmitted from one device to the next on the network.

(ii) Atieno was very happy when she bought a safaricom 2G modem for she was able to easily connect her computer to the internet. After six months she noticed it was taking her too long to connect to the internet .State two possible causes of the problem. (2mks)

- Many people may be using the same band/heavy data traffic
- The bandwidth she is using is narrow.

(d)Give three advantages of fibre optic cable. (3mks)

- Immune to electromagnetic interference and eavesdropping
- Fast and support high transmission bandwidth
- Low attenuation
- Suitable in highly flammable system because they do not generate electrical signals
- Smaller and lighter than copper cable hence suitable for space limited places.

(e) List three benefits of wireless communication over physical transmission media.(3mks)

- Flexible in operation because devices can be easily moved without losing access to network/
- Wireless network can span to large geographical region.
- Communication can take place via satellite in remote areas that do not have telecommunication infrastructure.

18. (a)State three reasons for use of binary digits in computer system. (3mks)

- Due to complexity of the natural languages
- Easy to design and fabricate digital systems using binary digits
- Digital devices are more reliable,small in size and power efficient compared to analog devices.

(b)Convert 39.75_{10} to binary. (4mks)

Conversion of 39_{10} -100111_2 (1mk)

Conversion of 0.75 -0.11 (2mks)

Correct answer 100111.11_2 (1mk)

(c)Using eight bits and two complement, subtract 78_{10} from 17_{10}. Give your answer in decimal notations. (6mks)

NB:Candidate should clearly show the working

Convertion of @ number to binary and make the bits equal- @1 mark(2mks)

78_{10} - 1001110_2

17_{10} - 0010001_2

Complement the negative number and add 1 to the ones complement

Complement of 01001110 = 10110001 - ½ mark

Add 1 + 1

10110010_2 - ½ mark

Add the two numbers 00010001_2

+ 10110010_2

11000011_2 - 1 mark

Conversion to decimals (- 128 + 64 + 2 + 1) = - 61_{10} 2 mark

19. a). List TWO characteristics of good information. (2mks)

-Relevant to its purposes

-From reliable source

-Correct, accurate and complete

-Communicated to the right person and at the correct time (1x2=2)

b). (i). What is a database management system? (1mk)

A program that manages the storage, manipulation and access data from the data base ii). State and explain THREE database models. (3mks)

Network: Data is represented as a collection of records and relationships joined by links

Hierarchical: Data and relationships among data are represented by linked records which are organized as a collection of trees

Relational: Data is held as a collection of tables

c). Describe the following types of files.

i). Master file. (2mks)

A file that holds permanent data in an organization against which transactions are processed

ii). Backup file. (2mks)

A file created from existing master files to store duplicate copies that can be used to restore the original file in the event of loss or damage

iii). Transaction file. (2mks)

A file that holds temporary incoming and outgoing data in an organization for a given period of time

d). Explain the file organization methods given below.

i). Serial. (1mk)

Records are written onto the disk in the order in which they come with no regard for sequence

ii). Indexed sequential. (1mk)

Records are arranged on disk in sequence with an index added for easier access iii). Random. (1mk)

Records are arranged on disk randomly with no obvious relationships among them

20. (a)(i) State any THREE factors you would consider before installing an operating system. (3 mks)

-The CPU specifications

-The Computers main memory

-The Hard disk space

-Application software compatibility

-Features of the OS version to be installed

(ii) Distinguish between software installation and software configuration in relation to operating system (2marks)

-Installation is the process of copying program files into a computer so that they can be executed, while

-Configuration refers to the process of fine tuning or defining options provided by the installed software.

(b)(i)With reference to an operating system, differentiate between formatting and partitioning (2mks)

Formatting is preparing a disk so that the operating system can write information on it by defining the tracks and sectors. Partitioning a disk refers to the process of dividing a large physical disk into two or more logical drives (partitions).

(ii) Explain any TWO types of user interface. (3 mark)

-Command line: Allows the user to type commands at a command prompt

-Menu driven provides the user with a list of options to choose from

-Graphical user interface provides the user with windows,icons,menus and pointers.

(c) A systems analyst is responsible for the introduction of a new computerized system after the software has been written and tested, and its hardware purchased. Describe ONE method of introducing this new computerized system. (2mks)

(i) Parallel – A system of change-over where the old system is run parallel with the new for a set period of time.
(ii) Phased – this involves changing from the old system in stages rather than all at once based on location of firm, subsystem or subfile.
(iii)Straight – This the complete replacement of the old by the new system at one go.

(b) 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 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.