FORM 4

COMPUTER STUDIES

MARKING SCHEME

SECTION A (40 MARKS)

1. State the technology used in the following computer generations (4×1/2=2mks)

    i. 1st generation

       Vacuum tubes

    ii. 2nd generation

        Transistors

    iii. 3rd generation

         Integrated circuits (ICS)

    iv. 4th generation

        Very large integrated circuits (VLSI)

2. State three ways in which computers have been used to fight the spread of corona virus in Kenya.

    (3×1=3 marks)

   a) Computers have been used to sensitize people on safety measures that help in preventing spread of virus

   b) For printing posters

   c) For conducting medical research in KEMRI

   d) For carrying out statistics for people infected with corona virus in Kenya in Kenya and comparing it with other countries

3. State and explain two types of booting in computer. (2×1=2 marks)

   a) Cold booting. This is a process of starting up a computer that was initially off by pressing power button on the system unit.

   b) Warm booting. This is a process restarting a computer that was initially on by pressing CTRL+ALT+DEL keys

4. Explain the term "log on" as applied in internet (2marks only)

   • Process used to get access to an operating system or application, usually in a remote computer system or application, usually in a remote computer. Almost always a logon requires that the user have (1) a user ID and (2) a password

5. (a) What is disk formatting? (1mark only)

- Disk formatting is the process of preparing a data storage device such as a hard disk drive, solid-state drive, floppy disk or USB flash drive for initial use

(b) State two reasons for disk formatting   (2×1=2 marks)

-To prepare a new disk so that files can be stored on it

-To create sectors & tracks for the storage of data

-To create/ prepare a new root directory and file allocation tables on the disk

-To remove/ delete any existing files or information stored on the disk, if it is no -longer needed

-To determine the effective storage capacity of the disk, i.e. formatting enables the user to know how much data the disk can hold.

- It can also check for bad sectors on the new disk.

6. Name the two files commonly used in mail merge   (3×1=3 marks)

    a. primary file

    b. secondary file

    c. merged file

7. State three reasons why an organisation may opt to develop its own software in-house rather than buy off-the-shelf software   (3×1= 3marks)

    a) Customised to suit business needs of the organisation.

    b) It can be upgraded as needed by the organisation.

    c) The organisation can have a module that the competitors don't have.

    d) The organisation develops only the modules needed/memory eptimization, or storage/space.

8. A particular computer stores numbers in a single 8-bit word. How would it represent? 0.3125_{10}

$$0.3125 \times 2 = 0.625$$
$$0.625 \times 2 = 1.25$$
$$0.25 \times 2 = 0.5$$
$$0.5 \times 2 = 1.0$$
$$= 0.0101 = 0.01010000_2$$

Method (1 mark)

0.0101 (1 mark)

0.01010000_2 (1 mark) (Total 3 marks)

9.   (a) What is a firewall?   (1×1=1mark)

- It is a program/software that filters out unwanted data and programs/criminals/hackers/malicious persons

9. (b) State the two reasons that may have necessitated disabling of the firewall. (3×1=3 marks)

- testing the communication link
- when upgrading the firewall
- when there is need to install an application and the firewall is preventing the operation
- when the firewall prevents legitimate communication

10. Differentiate between absolute and relative cell references. (2 Marks only)

- Absolute cell references do not change when a formula containing the absolute references is copied from one cell to another. E.g. A1
- Relative cell references change automatically when a formula containing the relative references is copied from one cell to another e.g. A1

11. Bentley Micro finance organization has offices in Kericho and Nairobi connected into a network. The management is convinced that someone is illegally gaining access to the data in their computers. State three ways the company can overcome this problem.

(3×1=3 marks)

- Encryption
- Firewalls
- User access level/Passwords
- Limit number of log in attempts
- Audit trail
- Log file

12. The following worksheet represents the number of litres of milk produced by different cows' species at Kajiado Ranch Ltd.

s/no	A	B	C	D	E
1	Month	Friesian	Ayrshire	Guernsey	
2	Jan	70	80	65	
3	Feb	120	62	75	
4	Mar	110	65	45	
5	Apr	70	45	60	
6					

The cost of each litre of milk is Kshs.30/=. This amount is typed in cell B10

(a) Write a function that will calculate the total number of litres of Friesian in all months

(1mark)

=SUM (B2:B5)

(b) Write a formulae using absolute referencing that can be typed in cell E2 and then be copied down to obtain monthly sales of milk. (2 marks)

=B10*(B2+C2+D2)

(c) Identify the data type in cell C1 and cell D3 (1mark)

C1 – Label

D3 – Value (2×1/2=1 marks)

13. State three main types of looping control structures as used in programming.

(3×1=3 marks)

- The WHILE loop
- The REPEAT …UNTIL loop
- The FOR loop

14. Advantages of wireless media to the school (2×1=2 marks)

- The school will find it easy to add or remove nodes on the system
- In case of new building is put up, there will be no need of interfering with communication media
- Users will find it safer to move around as there are no wires around the rooms
- Students will be able to roam as they access the network

15. State the functions of the following keys on the computer keyboard:

(a) Backspace *(1 mark)*

- This key deletes typed characters or words from right to left on the same line at the cursor position

(b) Tab key *(1 mark)*

- Tab key is used to move the cursor at set large interval space on the same line such as 0.5 inch, 10 inch

SECTION B (60MARKS)

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

16. a)

Start

Count =1

Wage = 0

While Count =< 5 Do

Enter Name, Number of hours worked

IF Number of hours worked <10 Then

Wage = Number of Hours Worked *500

Else IF

Number of Hours Worked <10 and Number of Hours Worked <15

THEN

Wage = Number of Hours worked* 700

Else

Wage = Number of Hours worked *900

Endif

Endif

Count =Count+1

Endwhile

Display Name, Number of hours worked, Wage

Stop

Start = ½

Stop = ½

Initialization Wage 0 and Count =1 =1

Condition 1 = ½

Condition 2 = 1

Condition 3 = ½

Loop = 2

Increase the count = 1

Display wage =1

Logic =1

(Total 9 marks)

d) List and explain six stages of Program development Life Cycle in their logical order

(6×1= 6marks)

- Problem recognition (Identification of the problem).- also referred to as preliminary investigation. Involves identifying the problem that needs to be solved through computerization

- Problem definition./requirement analysis- involves investigation of the system requirements such as user needs and functional requirements like the input, processing and expected output

- Program design. – representation of problem solving logic using design tools such as flowcharts and pseudo codes

- Program coding. – writing of a program source code using a particular programming language e.g Pascal, C++,Visual basic, Java etc.

- Program testing & debugging.- (testing)using test data in order to check on the correctness of the problem(de bugging)correcting program errors which are referred to as bugs in programming
- Program Implementation and maintenance.- actual delivery and installation of the new ready for use program

17. (a) State three limitations of traditional filing methods   (3×1= 3 marks)

- Unnecessary duplication of data
- Boredom and time wastage when searching records
- Misleading reports due to poor data entry
- Poor update of records

(b) Below are two table structures of files in a database.

TABLE A

FIELD	DATA TYPE
Employee name	Text
Employee number	Auto number
DOB	Date/time
Address	Text

TABLE B

FIELD	DATA TYPE
Employee no.	Number
Date employed	Date/time
Department	Text
Salary	Currency

i)   Which of the two tables is likely to be the   parent table   (1mark)

- Table A because it has employee information

ii)   It is advisable to 'enforce referential integrity' when creating a relationships. What do you understand by the term referential integrity?   (2marks only)

- To ensure all records entered in the related table exist in the primary table

iii)   The field 'Employee no' in Table B is likely to be the foreign key. What is a foreign key?

(2marks only)

- A unique field that identifies each record in the secondary table in a relationship

iv)   Which field in both tables is most appropriate for creating relationship?   (1mark)

- Employee number

v)   What would make the relationship between the tables fail to work?   (2marks only)

- The data type for the same field in two tables is not similar

(d) In databases the field properties specify finer details related to the fields and the table entries expected. State four field properties.   (4×1= 4 marks)

- Input mark
- Validation rule

- Required

- Indexed

- Field size

- Format

- Decimal

- Caption

- Default value

- Validation text

17. (a) Characteristics of octal number system.

- Each symbol is represented by 3 bits

- The number is made of 8 symbols 0, 1, 2,3,4,5,6,7

- Maximum value of a single digit is 7 (one less than the value of the base)

- This number system uses base 8

(Any 2 x 1=2 marks)

b) i) 111.101_2 to decimal (4 marks)

(method 1 ,working 2 , answer 1)

$111 = 1 \times 2^2 + 1 \times 2^2 + 1 \times 2^0$

$= 4 + 2 + 1 = 7_{10}$

$101_2 = 1 \times 2^{-1} + 0 \times 2^{-2} + 1 \times 2^{-3}$

$= 1 \times {}^1/_2 + 0 \times {}^1/_4 + 1 \times {}^1/_8$

$= 0.5 + 0 + 0.125 = 0.625_{10}$

$111.101_2 = 7.625_{10}$

ii) State any three reasons ways used to represent negative numbers. (3marks)

- Ones complement

- Twos compliment

- Signed Magnitude

iii) Conversion to binary (1 mark)

17_{10} -10001 00010001

45_{10} -101101 00101101

Convert to 1c 11010010 (1 mark)

Add the two numbers 00010001 +11010010 =11100011 (2 marks)

Reconvert to 1c 00011100 (1 mark)

Conversion decimal -28 (1 mark)

(Total = 6 marks)

19. a) What id data processing?   (2 x 1=2 marks)

- Transforming of raw facts to finished and wanted information

b) What is data cycle?   (2 x 1=2 marks)

- Stages through which data passes before if becomes the finished and wanted information and in the form wanted.

c) Types of transcription errors (2 x 2 = 4 marks)

- Misreading
- Transposition

d) Types of data processing methods (3 x 1=3 marks)

- Manual data processing.
- Mechanical data processing
- Electronic data processing

e) Outline **two** differences between a logical file and a physical file.   (2 x 2 = 4 marks)

- Logical file is a type of file viewed in terms of what data items it contains and details of what processing operations may be performed on the data items
- Physical file is one that is viewed in terms of how data is stored on a storage media and how the processing operations are made possible.

20 a) Difference between softcopy output devices and hardcopy output devices with example;

(1.5 ×2 = 3 marks)

- Softcopy output devices produce intangible output e.g. monitor, speaker, etc.
- Hardcopy output devices produce tangible output devices e.g. printer, plotter etc.

(b) List **three** advantages of Liquid crystal display   (3×1= 3 marks)

- Easy to carry/Less bulky
- Uses less power
- Doesn't affect eyes
- High resolution

c) Define the following terms   (4×1= 4 marks)

    a) Pixel

- Tiny dots that form images

    b) Resolution.

- Number of dots per inch on the screen. Determines the clarity of the picture

    c) VGA

- Video Graphic Adapter used to connect monitor to system unit.

    d) Refresh rate

- The rate of displaying an images. Monitors with low refresh rate tend to make pictures flicker.

d) Highlight **three** importance's of the internet in today's business.   (3×1= 3 marks)

- E business/E commerce
- Emails and Fax
- Instant messaging
- Social media and blogging
- Business electronic payment systems
- Electronic funds transfer/mobile banking
- Electronic points of sale

e) List **two** examples of web scripting languages   (2×1= 2 marks)

- HTML
- JavaScript
- CSS – Cascading style sheets