451/1
COMPUTER

MARKING SCHEME.

1.   a) Give a reason of the following disk management techniques (1 ½ mks)   *Nym*
        i)   Disk partitioning
                To enable two or more operating systems to be used
                To enable back – ups to be created (award ½ for any)
        ii)   Disk compression
                To create enough storage space *(Award ½)*
        iii)   Disk defragmenting
                To enable the system search for files faster(Award ½)
    b) Define the term internet (1mk)   *Nym*
        A connection of computer networks*(Award 1)*   *Nym*

2.   a) Define utility software (1mk)   *Nym*
        A software to accomplish common tasks*(Award 1 mk)*
    b) Describe the use of the following utilities (3mks)   *Nym*
        i)   Linkers Enables several sub programs to be connected when running (Award 1 mk)
        ii)   Debuggers To assist in tracing and removing errors from a program(Award 1 mk)
        iii)   Loaders : Assists in transferring an application from a secondary storage to a primary
             storage when running the application(Award 1 mk)

3.   a)Explain the concept of distributed databases (1mk)   *Nym*
    This is where databases are created for different departments in an organizations in different
    computers that are networked. (Award 1 mk)
    b) Give two advantages of distributed databases (2mks)   *Nym*
        -    Searching of items is fast
        -    No interference of other department's data(Award 1 mk each)

4.   a) Write the acronym BIOS in full (½ mk)   *Nym*
    Basic Input output system *(Award ½ mk)*
    b) What is the use of BIOS in a computer system (1mk)   *Nym*
    A software used to guide the computer during the process of booting*(Award 1 mk)*

5.   a) Briefly describe how the following data security measures function (3mks)   *Nym*
        i)   Audit trail : A study to evaluate if a system is secure. Acts as a measure of
             preventing crimes from occurring
        ii)   Log files: Records the activities taking place in a computerized system
        iii)   Fire walls : Acts as a vetting system for remote request of information from a
             system.
    b) Give any two reasons why passwords may not be reliable as security control measures
                                   (2mks) *Nym*
        -    Can be easily revealed by ignorant users
        -    Can be broken into by determined crackers through trial and errors

6.   a) Explain two uses of forms in database design (2mks)   *Nym*
        -    Enter data into tables
        -    Display data from tables & queries
    b) i)   Define the term control as used in report and form design (1mk)   *Nym*
        -   Is anything that is created or added to a form / report during design
        ii)   Explain briefly the difference between bound and unbound controls(2mks)
             Bound controls have fields as the source of data while unbound have got no fields as
             data sources.

7.   a) List any two components of a spreadsheets (1mk)   *Nym*
        -    Graphs and charts
        -    Databases
        -    Worksheets (Award ½ for any two)

c) In a worksheet, the marks scored by ten students are stored in cell B3 to B12. *Nym*
   i) In cell C3, show an expression you would use to obtain positions of the students using marks scored in descending order (2mks)
      = RANK (& B & 3 : & B & 12,O) (*Award ½ for RANK*)
      (*½ for first reference*)
      (*½ for second reference*)
      (*½ for order*)

   ii) In cell B13, write an expression you would use to extract the highest score from the marks (1mk)
      = Max (B3 : B12) (*Award 1*) *Nym*

8. Give the function of a surge suppressor (1mk)
   To protect computers & other devices from the effects of extra power.
9. Explain the meaning of the term bolding (1mk)] *Nym*
   Increasing the intensity of text

10. The table below shows the records of four students

ADMISSION NUMBER	SEX	MARKS	CLASS
026	F	70	4
118	M	40	3
150	F	50	3
152	M	30	4

   Given the following logical expressions.
   If NOT (SEX = 'F') AND (MARKS = > 50) AND (CLASS = 3)
   Indicate the result of the expression when applied on the record with admission 150 (2mks)
      - FALSE (Award 2) *Nym*
11. a) List any two types of signals that can be used in data transmission (1mk) *Nym*
      - Digital signals
      - Analog signals (*Award ½ each*)
   b) Explain the concept of ' Line of sight' in wireless communication (2mks) *Nym*
      This is where a receiver and a transmitter must "see" each other for them to communicate .
      This is why they are usually put on high grounds.
   c) Give a reasons why a communication satellite has to rotate at the same rate as the earth (1mk) *Nym*
      It has to remain is sight with the earth stations i.e it has to be geostationery.
12. What is a logical error in a program ? (1mk) *Nym*
   An error that results into wrong result of processing i.e the logic of processing is wrong
13. List any two methods one can use to test a program (1mk) Award ½ for each *Nym*
      - Dry running
      - Using test data
      - Using a translator or
      - Using a debugger – special program to trace errors

14. a) Define the term e-mail (1mk) *Nym*
      Sending and receiving electronic letters through the internet.
   b) Give two disadvantages of using e- commerce rather than the conventional method of carrying out business(2mks) *Nym*
      - One can be conned easily
      - No proper laws governing the business
      - You deal with people without meeting them. (*Award 1 for each of the listed*)
15. a) Give a reason or formatting a document (1mk) *Nym*
      - Make it attractive

- Draw attention to important (Award 1 for any)

b) Give any two word processor softwares (1mk)
- Ms word
- Word perfect
- Wordstar
- Word pro   (*Award ½ for each of the list*)

SECTION B (60 MARKS)

Answer question 16 and other 3 question from this section

16. a) Explain the following characteristics of an object oriented programming language.
   - i)   Properties: Data or characteristics found in an object e.g. size, colour e.t.c
   - ii)   Methods. Methods are actions to be performed by an object e.g. instructions
     (award ½)   *Nym*
   - iii)   Events Actions / things that happen e.g. clicking, pressing a keyboard button e.t.c
     (Award ½)
   - iv)   Objects Is a collection of information and actions*(Award ½)*   *Nym*

   b) i)   Give two differences between interpreting and compiling a high level language.
      - Interpreting converts an instruction, runs it before proceeding to the next while compiling converts all instructions before running them
      - Interpreting does not store object program while compiling stores an object code.   *(Award 1 for each) *Nym**
      ii) Give an advantage of compiling over interpreting a program (1 mrk)   *Nym*
      Compiling is faster than interpreting.

   c)   The formula of finding the roots of a quadratic expression is given here below
      $$root = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$ *Nym*

   In finding the roots, the values a,b, and c are identified and then the discriminant i.e.
   $b^2 - 4ac$ is calculated   *Nym*
   If the discriminant is negative , then the roots are termed as " imaginary" otherwise the two roots are calculated using the formula.

   - i)   Write a pseudo code that will solve the problem above. The values of a, b and c are entered from the keyboard . (5mks)   *Nym*

   START
   Enter values a,b& c
   Read a,b & c
   Calculate discriminant using b^2 - 4 x a x c
   If discriminant < o then
   Display ' roots imaginary
   Else
   Calculate root 1 = -b + sqrt (discriminant / 2 x a)
   Calculate root 2 = - b – sqrt (discriminant / 2 x a)
   Display root 1 , root 2
   END
   (Award 1 mk for start & end)
   (Award 1 mk for reading a,b & c)
   (Award 1 mk for testing discriminant)
   (Award 1 mk for proper calculation of roots)
   (Award 1 mk for output of roots & imaginary

ii) Write a program using either Pascal or c languages to find the two roots

(5mrk) *Nym*

- In Pascal;
  Program quad (input, output);
  Var
  Root1, Root2: real;
  A,b,c : integer;
  Begin
  Writeln (' enter the value of a,,b and c') ;
  Readln (a,b,c);
  If (sqr (b) < 4 * a * c) then
  Writeln (' Roots are imaginary');
  else
  Begin
  Root 1: = -b+ sqrt (sqr(b) -4 *a*c/ /2 *a);
  Root 2 : = -b-sqrt (sqr(b) -4 *a*c //2 *a);
  writeln ('Root1 = , Root1);
  writeln ('Root 2 = ', Root 2);
  end;
  end

  Award 1 mk for declaration of variables
- Should be enough
- Should be correct data type
- Should be syntactically correct
  Award 1 mk for input & output
- Check proper reading of values a,b & c
- Check output of two roots and imaginary
  Award 1 mk for proper use of a selection statement
- Check syntax
- Check alternative e.g. else
  Award 1 mk for use of proper calculations in roots.
- Check breakdown of the equation into a simpler format-
- Check syntax of any function used e.g sqr, sqrt, brackets e.t.c
  Award 1 for neatness
- Check cancellations

17. a) i) Explain the meaning of the term file organization (1mk)   *Nym*
   Is the way data is stored in a file
   ii) Indicate the method of file access for the following file organization methods *Nym*
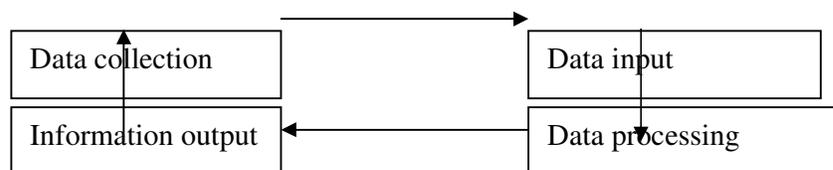   Indexed sequential- Direct
   Sequential -serial or binary search
   Serial- serial
   Random - Direct

b) The diagram below shows the data processing cycle (award ½ each)

```
  ┌──────────────────┐        ────────────────▶   ┌──────────────────┐
  │ Data collection  │                            │ Data input       │
  └──────────────────┘                            └──────────────────┘
  ┌──────────────────┐       ◀────────────────    ┌──────────────────┐
  │ Information output│                            │ Data processing  │
  └──────────────────┘                            └──────────────────┘
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i) List the six stages of data collection in their correct order (3 marks)   *Nym*
- Data creation
- Data transmission
- Data preparation   *(Award ½ for each listed)*

- Media conversion   *(Deduct 1 mk if not in correct order)*
- Data validation
- Sorting

ii)   List any four data collection media that can be used to collect data(2mrks) *Nym*
         MICR
         OCR   – portable Encoding devices e.g tape recorders
         Portable encoding devices e.g tape recorders.
         Barcode readers (wand scanner)
         Key – to - diskette *(Award ½ each)*

iii)   List and explain the three methods that can be used to accomplish the task of
         processing data (3mks)   *Nym*
         - Manual – No machine used – may be pen and paper
         - Mechanical – simple machines are used to process data
         - Electronic – Automatic devices that work under the guidance of programs are used
           to process data e.g. computer.
         (Award ½ for each listed method)
         (Award ½ for each correct description)

c)   Explain the difference between
i)   Logical and physical files (2mks)   *Nym*

         A logical file is a user view on the arrangement structure and processing of a file
         while a physical file is the actual arrangement of a file on a storage device
         (Award 1 for each part)

ii)   Transcription and transposition errors (2mks)   *Nym*

         - Transcription errors occurs during the process of changing data to a form a
            computer understands.
         - Transposition errors occurs as a result of interchanging position of characters e.g.
            typing 163 instead of 136
         (Award 1 for each part)

18.   Organisations use massive resources to develop information systems
    a)   i)   Define the term information system (1mk)   *Nym*
                    This is a person machine system that is highly integrated designed to provide
                    managerial with information.
            ii)   Describe any three elements of an information system (3mks)   *Nym*
                    - Input   - Controls   - boundaries
                    - Process   - Environment   - Interface
                    - Output   - Feedback
            iii)   What is the main purpose of information system (½ mk)   *Nym*
                                    To provide information that will assist in making decisions.

    b)   During system analysis, information has to be gathered to enable the analyst
            understand the system under study
            i)   Explain two methods available to an analyst to enable him gather information
                    (2mks)   *Nym*
                    i)   - Use of interview face to face interpersonal role – to get information
                    ii)   - Document review – taking document to get information (Award ½ for
                            proper description).
                    iii)   - Questionaires – writing questions down to be answered
                    iv)   Observation – Going to the place of work and seeing what is
                            happening.
                            (Award ½ for any two listed)

ii) Give two advantages and two disadvantages for each of the answers in bi) above (4mks) *Nym*

I : Interview

Advantages
- Flexible – one can change according to circumstances
- Can get information on complex subjects
- People enjoy being interviewed
- Can be used to evaluate validity of information gathered.
Award ½ for each adv.

Disadvantages
- Requires more skills – communication
- Time consuming – one person at a time
- Puts more pressure on respondents to provide immediate feedback
- Questions are less standard
Award ½ for each disadv.

2. Questionnaires *Nym*

Advantages.
- Less skills required
- Questions are standard
- Can be administered to a large number simultaneously
- No pressure on the respondent to give immediate feedback
- Respondents feel secure because of anonymity
Award ½ for each adv.

Disadvantages
- Postal questionnaires may get lost

3. Observation *Nym*

Advantages
- Enables one to get as close as possible to the system
- One gets first hand information

Disadvantages
- You intrude into one's working place
- Attitudes and motivation can not be observed
- Takes a lot of time since you observe one event at a time
- Respondents can change the pattern of working due to your presence leading to misinterpretation

4. Document review / Reading around the system *Nym*

Advantages
- Enables one gain background knowledge of systems
- Enables an analyst to take time to study the document
- The documents are useful in documentation of the system

Disadvantages
- Time consuming & expensive
- Written documents become outdated faster
- Documents show only official state of affairs.

ci) Documents for any system developed is important

i) Explain the meaning of system documentation (1mk) *Nym*
   Act of providing information on the system

ii) Describe any two reasons why documenting a system is important (2mks) *Nym*
   - Enable maintenance to take place
   - Allow one to understand a system
   - Enables users to ensure that the system meets their requirements
   - Supports entire life cycle of system development *(Award 1 for each)*

iii) What is system review (½ mk) *Nym*

A study after the system has been implemented to assess how it is working compared to what was planned / intended

    iv)   List two types of system maintenance (1mk)   *Nym*
- Emergency maintenance – For correcting errors
- Development maintenance – For improving the system. Also called modification maintenance *(Award ½ for each listed type)*

19.   a)   Describe the use of the following buses (3mks)   *Nym*
        i)   Data bus
            A channel that transmits data from one element to another (Award 1)
        ii)   Address bus
            A channel that transmits addresses to be used in identifying location of an instruction or devices *(Award 1)*
        iii)   Control bus
            A channel to transmit control signals from the control unit to other parts of a computer. *(Award 1)*

    b)   In relation to the control unit of the CPU, explain the three stages of the fetch execute cycle (3mks)   *Nym*
- An instruction is fetched from the memory
- An instruction is interpreted (decoded)
- An instruction is implemented
        (Award 1 mk for each stage correctly described)

    c)   A CPU has got registers for internal operations   *Nym*
        i)   Define the term register (1mk)
            A one cell storage unit in the CPU
        ii)   Describe the functions of the following registers (3mks)   *Nym*
            Instruction register
            To store an instruction part of an expression / code *(Award 1)*
            Working register
            Stores a data part of an expression / code *(Award 1)*
            Accumulator
            Stores intermediate results or results from immediate processing (Award 1)

    d)   Indicate an area of application for (3mks)   *Nym*
        i)   Joystick playing games
        ii)   Touch screen in areas where people are standing or wet areas –e.g hotels
        iii)   Graphic tablet for designing e.g. CAD

    e)   Explain the difference between softcopy output and hardcopy output(2mks) *Nym*
        Softcopy is information on intangible output devices e.g. on monitors, sound light emitting diodes while hardcopy output is information on physical media e.g. on printed papers *(Award 1 for each part)*

20. a) i)   Define the term telecommuting (1mk)   *Nym*
        A situation where a worker sits at home and works there using a computer connected to place of work. The work is sent to the place of work using the network
    ii)   Give two advantages of telecommuting (2mks)   *Nym*
- Reduces travel expenses
- Reduces traveling stress
- Reduces interruptions at places of work
- Reduces need for offices   *(award 1 mk for any two)*

  b) i)   What is the difference between a teletext and videotext communication (½ mks)
                Nym
- A teletext is one way communication whereas a videotext is two way communication.
    ii)   Give two advantages of using teletext/ videotext for communication (2mks) *Nym*
- Tvs are readily available hence can reach many people
- Easier to use *(Award 1 for each)*

c)   Describe THREE ways in which computers are used as industrial systems. (4 ½ mks) *Nym*
-      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)

d)   In relation to weather forecasting   *Nym*
i)   Write GIS in full (½ mk)
       Geographical information system
ii)   What is the use of GIS (1mk)
       Enables weather patterns to be displayed on the world map.

e)   Use one's complement to calculate (3 ½ mks)   *Nym*
     1101 – 11
-      Change nuend to 4 digits
       i.e 11 $\longrightarrow$ 0011 (*Award 1 mk for place values*)

       Find the complement of nuend
-
       i.e $\longrightarrow$ 1100 (*Award 1 mk for complement*)

-      Add
       1101
       1100   +
       11001 (*Award 1 mk for correct addition*)

-      Carry end – round carry
        1001
        + 1 (*Award ½ for correct end- round carry*
        1010

       Ans = 1010_2