**Computer studies**

**Paper 1**

**2 ½ HOURS**

**MARKING SCHEME**

**Section A (40 marks).**

1. **Give importance of having the following in computer laboratory. award 3marks each 1 mark**
2. Standard furniture in the laboratory
* To avoid poor posture during machine use this may lead to strain, injury and limb fatigue
1. Antiglare screen/ monitor
* To avoid eye strain and fatigue caused by over bright cathode ray tube monitors (CRT)
1. UPS
* Temporary power supply to the computer to allow the user to save the work (power back up)
* Stabilize power (clean unstable power supplied from the main source to clean stable voltage)
1. **ROM (Read Only Memory) it is used to store programmed instruction and data permanently or semi permanently.**
* Data and instruction stored in Rom are those required to remain uncharged for long period of time
* RAM (Random Access Memory) its content can be read directly regardless of the sequence in which it is stored.
* Its content is held temporarily and if content lost, is lost once the computer is turned off.
1. **Explain the following computer crimes (2marks)**
2. Fraud – Use of computer to conceal information or cheating other people with the aim of getting money. ***(1x1 = 1mk)***
3. Alteration – Changing the data or information without permission with an aim of missing informing others. ***(1x1 = 1mk)***
4. **(a) Define**
5. **Firewalls  *1mk***
* It is a program or hardware or a combination of both that filters the information coming through the internet into a computer

 **Or**

* It is a program that filters the information coming through the internet into a computer
1. **Data encryption *1mk***
* It is the encoding of data during storage or transmission so that it cannot be understood by those who do not have encryption key.
* The word scrambling can be used in place of encoding or
* Software or device that filters data between different networks by enforcing the host network access control policy.
1. **Differentiate between the following terms as used in word processing (3marks)**
* Drop cap is a large character at the start of paragraph that occupies more than one line downwards while text case is capitalization of text ( you can switch from either lower or uppercase)
* A superscript appears just above the rest of the characters while subscript appears just below other characters while subscript appears just below other characters
* An indent is a white space at the beginning of each line while tabs are used to add uniform spacing in the line of text
1. (a) **Computer processing file**
2. Master file – Is the main file that contains permanent records of a particular entry.

(ii) Transaction – Working file whose information is expected to change regularly – i.e. daily

(iii) Reference

(vi) Back up

(v) Sort

(vi) Report ½ mk stating , ½ mk explanation

 **(b) List any two organization methods (2marks)**

* Hierarchical file organization
* Horizontal
1. (a) Webpage - a page in a website ***(1mark)***

 (b) Blog – a website which enables one to post or submit his or her personal details to a website; so that

 the details can be accessed from the website. ***(1mark)***

 (c) Hyperlinks – text or graphic which opens another webpage or website when clicked (***1mark)***

1. Web portal - a website that function as a point of access to information on the World Wide Web
2. **(a) DTP** - has several design templates for various publications
* Is more powerful in manipulating graphics / texts
* Enables formatting and manipulation of individual text and frames separately
* Enable complex document format printing

 **(b) Differentiate between the following**

 (i) Kerning – fixing visual denseness of pairs of character in text

 Tracking– spacing between characters in text

Margins – space around the text in the four edges of a document

 Column guides – non printable guides for column layout

1. Simulation – process of creating a model of a real object, concept in order to experiment the behavior of a real object
2. Baseband signal – Digital signal transmitted through a digital channel without modulation ***( 1mk)***

 Broad band - A group of analog signals transmitted through a common channel but with varying signal frequency ***(1mk)***

1. **Explain how the operating system controls the following resources (3marks)**
2. Processor – the O.S assigns tasks one by one to avoid completion
3. Main memory – the OS determines which task should occupy the main memory at any given time
4. Input and output devices – the OS controls data input and information output
5. **What is deadlock in reference to operating systems (1mark)**

 Is a situation that results when several tasks complete for a resource which is held and not being released for use by another task.

1. **(a) A magnetic disk is a direct access storage media (DASD) that permits the computer to find**

 **data directly on the disk**

 (b) **Hard disk provides greater storage capacity than the floppy disk. (1mark)**

 Hard disk operates or much higher retrieval speed

1. **Define the following computer crimes**
2. Making illegal copies of copy righted software information or data **(1mark)**
3. Industrial espionage – Spying in your computer to get information that can use to counter finish a

 competitor **(1mark)**

1. **Explain two ways of protecting data and information against unauthorized access (2marks)**
* Password protection – A password to open or exit the database file i.e. lets any user who wishes to do any action (**2mark)**
* Data encryption – If the database is to be sent electronically encryption secures the data from un authorized access
* User and group permission to users on data base object such as queries form and reports
* User level security – this feature is used to assign permission to users in order to limit user access to certain database object

**SECTION B (60MARKS)**

1. **(a) list two examples of**
2. **Third generation languages (2marks)**
* Pascal
* FORTRAN
* BASIC
* COBOL
1. **Object oriented languages (2marks)**
* Simula
* Small talk
* Java
* C++

(b) **Define (2marks)**

1. Object code
* It is a machine code produced by a computer
* It is an output of a translator
* It is a translated source code
* Translated program code
1. **Source code**
* This is a program written in the specific programming language
* Un translated program code
* Program in human understandable

**(c) Differentiate between a compiler and an interpreter (2marks)**

|  |  |
| --- | --- |
| Compiler  | Interpreter  |
| Fast in translation  | Relatively slow translate line by line  |
| Translate whole program at once  | Translate line by line take less memory  |
| Take up large memory space  | Take less memory every time program is run hence  |
| Saves time because Exe file is saved | Every time program is run hence consume time  |

1. START

PRINT ENTER CAR NUMBER

PRINT ENTER NUMBER OF DAYS

IFNUMBEROFDAYS>=7THEN

(NUMBER OF DAYS X 2500) – (NUMBER OF DAYS X 2500) 25%

ELSE

NUMBER OF DAYS X 2500

END IF

1. **(a) Subtract 01112 from 10012 (2marks)** 00102

  **(b) Using two’s compliment, subtract 7 from 4 and give the answer in binary notation. (4marks).**

 7 = 1112

 4 = 1002

 -4 in two’s compliment is 100

 ∴ 111

 100

 + 1011

 The resulting answer is 011 since the overflow is ignored. In decimal notation that is 310

**(c) Convert**

1. **91C16 to octal (3marks)**

|  |  |  |
| --- | --- | --- |
| 9 | 1 | C  |
| 1001 | 0001 | 1100 |

|  |  |  |  |
| --- | --- | --- | --- |
| 100 | 100 | 011 | 100 |
| 4 | 4 | 3 | 4 |

 91C16 = 44348

1. 3778 to hexadecimal (3marks)

|  |  |  |
| --- | --- | --- |
| 3 | 7 | 7 |
| 011 | 111 | 111 |

|  |  |  |
| --- | --- | --- |
| 0000 | 1111 | 1111 |
| 0 | F  | F  |

 ∴ 3778 = FF16

1. 9.62510 to binary (3marks)

 9 = 1001

 0625 x 2 = 1.25 WRITE 1

 0.25 x 2 = 0.5 WRITE 0

 0.5 x 2 = 1.0 WRITE 1

 9.62510 = 1001.1012

1. A school computer laboratory is scheduled to undergo major renovations. The lab is schedule to receiver new computer whose specifications are given below:-

Pentium IV 2.8GHz processor

40GB HDD

3 ½ FDD

256MB RAM

56CD Rom

 17” SVGA TFT monitor

 The computers are gong to be networked and will be able to browse the internet.

1. **Explain what is meant by the terms:- (2marks)**
2. **FDD**
* An acronym for floppy disk drove which the computer possesses for 3 ½ size disks
1. **HDD**
* An acronym for hard disk which the computer possess and its storage size is 40GB
1. **SVGA**
* An acronym for thin film transistor monitor type
1. **TFT**
* An acronym for thin film transistor monitor type
1. **The computer is to be networked, name one extra device that should be fitted on every computer to enable this to happen** (1mark)
* NIC (network interface Card)
1. **The computer is to receive internet facilities through the server on a dial; up system. Name and describe the function of a special device that needs to be connected to the server to complete the connection.**  (1mark).
* A modem
1. **(i) The school has to apply he star topology to link up the computer. List two advantages of this**

 **type of topology.**  (1mark)

* Easy to configure
* Allows centralization of key networking resources like concentration and servers
* Gives network administration focal point for network
1. **Name the central device used to connect the computers in this topology. (1mark)**
* Hub
1. **List two other types of topologies that the school could have opted for (1mark)**
* Bus topology
* Ring topology
* Mesh topology
* Tree/ hierarchical topology

1. **List four advantages of using a network (2marks)**
* Improves reliability e.g. incase one computer breaks down, users can still access data and information from other computer on network
* Resources sharing i.e. data/ information, files, printers, modems, programs etc can be attached to the network for access by all users
* Distributed processing facilities
* Remote communication i.e. transfer of data signals between two communication devices located differently
* Cost effectiveness. Although initial cost of laying down the network components may be expensive the savings experienced and the value added to service delivery make them a
1. **(i) Data transmission via the internet is done using a mode known as packet switching. Describe this data transmission mode (1mark)**
* Refer to the process over the network of breaking down into discrete systematic steps the data transmission process and at each step a certain action takes place.
1. **Name two other modes of transmission (1mark)**

 Simplex Mode

 Half Duplex and Full Duplex

**h) (i) The school’s LAN is done using UTR cable. List two advantages of using this type of cable.**

 **(1mark)**

* Don’t have shield that prevent electromagnetic interference (EMI)
* Cheap (not costly)
1. List two advantages of using fibre cable in networking (1mark)
* Hard to tap (security)
* Immune to effects of moisture and light.
* Does not suffer from E.M.I
* Flexible in size.

iii) Data flows in the school’s LAN in a duplex manner. Discuss two other types of data transmission in

 network giving examples (2marks)

* Hard duplex (Bi – directional)
* Data flows in both direction but only one direction at a time.
* Simplex
* Data flows in one direction on the communication media.
1. (a) Consider the topologies demonstrated in the diagram below.

 (i) A-Free/ hierarchical topology

 B – Ring topology

 C – Mesh topology

1. Point 1 and 2 (1mark).

Terminator

1. Mesh topology
2. **Highlight three disadvantages of topology B. (3marks)**
* Modifying the topology is difficulty
* Trouble shooting is difficult
* One device breakdown affects the whole system
1. **Identify the device labeled X in topology A (1mark)**
* Hub

(b) **State two main classes of network software (2marks)**

* Network protocol
* Network operating system

**(c) Briefly describe the following as used in networking (4marks)**

1. Repeaters - A device that receives signals from one send it to another segment. (4 marks)
2. Network hub – a device that connects computer onto network.
3. Fibre optic cables – transmission media that transmits data using light.
4. Network interface card (NIC) – a device inside the system box linking them onto transmission media.
5. **(a) Define the following terms**
6. **Database ( ½ mark)**
* It is a collection of data stored for organizational use
1. **Database management system ( ½ mark)**
* A collection of programs required storing, organizing and retrieving data from a database
1. **Hierarchical database (1mark)**
* A database structure where data is organized like a family tree having branches made up of parent and child records with each parent record having several child records and never vice versa
1. **Relational database (1mark)**
* A database structure in which data is organized in two dimensional tables called relations where an element in any one table can be related to another piece of data in another table as long as they have a common data element.

 Diagram

1. **Network database (1mark)**

 Diagram

(b) **List the advantages of using an electronic database system for storage of data over the file approach.** (4marks).

* Data is input only once and is made available to the many files
* Avoids duplication of files
* Avoids duplication of tasks at different points hence being economical
* Due to shared records, there is reduced processing time, reduction in use of hardware and lead to ‘√
* More efficient use of data processing personnel ‘√
* Leads to improved flow of data that is valuable to management as it is comprehensive (encompassing all) ‘√
* Leads timely and accurate reporting of data to all maintenance centres ‘√
* Reduction of paper costs ‘√
* Saving on storage space ‘√

(c ) Study the spreadsheet below and answer the questions that follow

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | A | B | C | D  |
| 1  | WESTERN COMPBOOK CENTRE SALES |
| 2 | BOOK TITLE  | PRICE PER BOOK  | BOOKS SOLD |  |
| 3 | DBASE IV  |  400.00 |  145 |  |
| 4 | LOTUS FOR DUMMIES  |  460.00 |  15 |  |
| 5 | OFFICE WORD IN 3 DAYS  |  300.00 |  65 |  |
| 6 | LEARN C++ IN 3 DAYS  |  700.00 |  100 |  |
| 7 | TEACH YOURSELF PASCAL  |  700.00 |  200 |  |
| 8 | COMPUTER STUDIES  |  500.00 |  300 |  |
| 9 | THE CLEVER FOOLCOMUTER |  300.00 |  10 |  |
| 10 |  |  |  |  |

1. **Write down the formula that can be used to find the price of the most costly book (1mark)**

 = large ((c3:c9),1) or = max (c3..c9)

1. **Write down the formula that can be used to determine the total sales for the book titled COMPUTER STUDIES**  (1mark)

 =b8\*c8

1. **Write down the formula that can be used to determine the average price of the books. (1mark)**

 =ave(B3.B9) or + (B3 + B4 ÷ B5 + B6 + B7 + B8 + B9)/7

1. **Write down the formula in cell D6 that can be used to find the new per book if they went up by a percentage written in cell B 10 and the formula has to be entered only in cell D3 then be copied to others.**  (1mark)

 =b6\*$B$10

1. **Write down the output in D7 if in B6 is 10% (1mark)**

 770

**(d) State any four advantages of using an electronic spreadsheet as compared to a traditional worksheet. (2mark)**

* Utilizes powerful aspects of computer like speed, accuracy and efficiency to enable the user quickly accomplish his/ her tasks
* Have inbuilt formulae called functions that enable the user to quickly manipulate mathematical data
* Have better document formatting capabilities
* Automatically adjust the result of a formula if the values in a worksheet are changed i.e. automatic recalculation
* Enables the user to produce neat work because traditional papers, pencil, rubber and calculator are put aside.
* Utilities the large storage space on computer storage devices to save or retrieve documents.