**451/1 - COMPUTER STUDIES – Paper 1**

**NYERI CENTRAL END TERM 2 EXAMINATIONS**

**Kenya Certificate of Secondary Education**

**(THEORY)**

**June. 2020 – 2½ Hrs.**

***MARKING SCHEME***

1. **Differentiate between embedded computer and dedicated computer (2 mrks)**
* *Embedded computers are special purpose computer used inside another device and usually dedicated to specific functions.*
* *Dedicated computer is a general purpose computer designed to perform a specific task.*
1. **The current monitor technology use LED back lit technology. Give two advantages of using TFT monitors over CRT monitors (2 mrks)**
* *Images formed in TFT do not suffer from angle distortion*
* *TFT have low power consumption than CRT*
* *TFT have a higher resolution than CRT*
1. **A Form four student wants to send a large document to a printer.**
2. **State the name for the area of memory that the document is sent to immediately from RAM(2 mrk)**
* *Input buffer*
* **As the printer runs out of paper during printing, the operating system sends a signal back to the computer to stop temporarily. Name this function of the operating system (1 mrk)** *Interrupt handling*
1. **a) Differentiate between a flash memory and compact disk as used in computer storage devices**  (2 mrks)

|  |  |
| --- | --- |
| **Flash memory** | **Compact disk** |
| * *Solid state device*
 | * *Optical media*
 |
| * *Plugs directly to the USB port*
 | * *Requires a disk drive*
 |
| * *Fast access of data*
 | * *Slow access of data*
 |
| * *Uses circuitry access*
 | * *Has moveable read and write head*
 |

**b) People like using a DVD over a compact disk yet they are of the same physical size, state three reasons that justifies this (3 mrks)**

* *A DVD has a higher storage capacity*
* *A DVD offers a better sound and picture quality than a CD*
1. **For a monitor to display images, it must be connected through video port to a video adapter or controller mounted on the mother board. What is the role of a video adapter (2 mrks)**
* *It determines the resolution and clarity of the monitor*
1. **Name four categories of input devices (2 mrks)**
* *Keying in devices*
* *Pointing devices*
* *Scanning devices*
* *Automated method*
1. **Name any two physical measures taken to protect a computer lab from unauthorized access.(2 mrks)**
* *Burglar proofing the room*
* *Use of alarms*
* *Use of padlocks*
* *Use of special cards*
* *Employing security guards*
1. **Most word processors have some automated features such as word wrap and type over modes. Describe these features (2 mrks)**
* *A wordwrap is a feature that enables the cursor to move automatically to the start of a new line/page*
* *Type over mode (overwrite mode) enables the user to edit an individual character of a word in a text document*
1. **Differentiate between proofreading and formatting a document as used in word processing (2 mrks)**
* *Proofreading is the process of checking whether the document has typographical or grammatical errors*
* *Formatting a document refers to enhancing the appearance of a document to be attractive and appealing to the eye of the reader*
1. **Most computerized systems in different organizations face a lot of unauthorized access such as Eavesdropping, Surveillance and Industrial espionage. State a control measure against each vice**  (3 mrks)
* *Eavesdropping: refers to tapping or listening into a communication channels to get information*
* *Surveillance: Refers to monitoring use of computer system and networks using background programs such as spyware and cookies*
* *Industrial espionage: it involves spying on competitor to get information that can be used to cripple the competitor*
1. **A world wide web is a vast virtual space in the internet where information is made available such as web portals and blogs. Different between a web portal and a blog (2 mrks)**
* **Web portal**: it is a specialised websites that offer restricted services such as e-learning, searching, e-mail, and sports to registered user updates, financial news and links to selected websites.
* **Blog**: It is a website that contains personal information which can easily be updated
1. **Differentiate between filtering and hiding of rows/columns as used in spreadsheets (2 mrks)**
* *Filtering is the process of finding and working with a subset of related worksheet.this will display only the rows that meet the condition or criteria specified.*
* *Hiding columns: it the process of making a columnl not be shown on the display or printed when you print the worksheet. The****column****is not deleted.*
1. **Industrial plants use computer systems in different ways such as Computer Aided design, manufacturing, Simulation and process control. Explain how computers are used in the mentioned areas above (4 mrks)**
* *Computer Aided design: it is an integrated system that allows products that have been designed using design application software*
* *Simulation: it allows some activities that would otherwise be expensive and dangerous in real life to be put under test*
* *Process control: it refers to the use of a computer system to control an ongoing physical process.*
1. **a) Differentiate between Job displacement and Job replacement (2 mrks)**
* *Job replacement implies that the employees who are computer illiterate lose their jobs and replaced by computer literate people*
* *Job displacement is where the computer illiterate workers are moved from a department with computers to another place which does not require computer literacy.*

b) State three advantages of using automated production in manufacturing plants (3 mrks)

* *Increased efficiency due to the balancing of workload and production capacity*
* *Improved customer service*
* *Efficient utilization of resources such as raw materials*
1. **Due to high demand and dynamic nature of computers and information systems, there is need for qualified computer trainers are required. What are the roles of computer trainers(3 mrks)**
* *Training people on how to use a computer and various application programs*
* *Developing training reference materials*
* *Guide learners on how to acquire knowledge through carrying out research*
* *Advising the learners on the best career opportunities in the field of ICT*
* *Preparing learners for ICT examinations*

***Section B.***

1. **. a) By use of a Flowchart construct, differentiate between a while loop and Repeat… Until loop** *(4 mrks)*

Condition?

yes

No

statement

WHILE..DO Loop

FOR Loop

Condition?

Loop Variable = Upper limit

Upper limit = Loop

variable - 1

Statement

* *In the WHILE Loop, the condition is tested before the execution of statements while REPEAT loop statements are executed before the condition is tested*
* *In WHILE loop, statements are executed until the condition becomes FALSE the you exit while in REPEAT loop, you exit when the statement is true*
* *In WHILE loop,statements may exit without any statement being executed while in REPEAT loop atleast one execution of statements must be done*

**.b) Study this flowchart and use it to answer questions that follows**

YES

NO

 S= 1

ENTER Y

 Y = Y/10

Y < 10?

S = S+1

PRINT S

1. **Give the expected output from the flowchart when the value of Y is (4 marks)**
2. **48** S=1

 Y=4.8

1. **800**

S=2

Y=8

1. **Write the pseudocode that can be used to create a program represented by the above flowchart (7 marks)**

*START*

 *S=1*

 *READ Y*

 *REPEAT*

 *Y=Y/10*

 *S=S+1*

 *UNTIL Y<10*

 *PRINT S*

*STOP*

1. **. a) Differentiate between a primary key and a foreign key as used in Database (2 mrks)**
* *Primary key is a special index that enforces uniqueness in a table*
* *Foreign key is a field in a table that matches the primary field in another table*

**.b) State four factors to be considered when designing a good database (4 mrks)**

* *Carefully study the requirements of the user in order to define all the data inputs, outputs and relationships required*
* *Design a draft database on the paper to determine the number of files or tables required*
* *Divided the information into separate fields, records and tables to allow flexibility in manipulating the database*
* *Define a field for each table that will be used to identify each record uniquely*
* *Give the most important fields the first priority*
* *Design data entry forms needed for the database*

**c) Explain the use of each of the following field data types as used in database (3 mrks)**

1. **OLE object**
* *It is used for storing graphical objects such as pictures*
1. **Look up wizard**
* *It is a field displays the data as a drop down list so that the user can select the desired value from the list*
1. **Memo**
* *It is a field in database that contain alphanumeric data and can accommodate a maximum of 32000 characters*

**d) Kibet has been experiencing a lot of problems in his computer. As a result, he decided to format his computer and re-installed a new operating system.**

1. **What is Formatting in relation to the above context (2 mrks)**
* *It is the process of preparing a new storage media by imprinting empty sectors and tracts on the surface of the disk so that the operating system can recognize and make it accessible*
1. **What precaution must kibet observe before formatting his computer (1 mrk)**
* *Make a backup of all the documents to avoid losing them*

**e) You are required to purchase an operating system. State three factors that you should consider before acquiring the software (3 mrks)**

* *Hardware configuration*
* *The type of computer in terms of of size and make*
* *The application software intended for the computer*
* *User-friendliness*
* *Documenmtation available*
* *Cost of the operating system*
* *Reliability and security provided by the operating system*
1. **a) Define the following terms as used in networking (3 mrks**
2. **Broadband**
* *An analog signal sent over the transmission medium using a particular frequency*
1. **Bandwidth**
* *It is the maximum amount of data that a transmission medium can carry at any one time*
1. **Multiplexing**
* *It is the process of sending multiple data signals over the same medium*

**b) List Four elements of networking (2 mrks)**

* *data communication media*
* *communication devices*
* *networking software*
* *data signals*

**d) Most institutions are moving towards the use of Fibre optic cables. State three reasons why Fibre optic is preferred (3 mrks)**

* *It is immune to interference and eavesdropping*
* *It is fast and support high bandwidth*
* *Large distance can be covered because it has low attenuation*
* *Can be used in hazardous places (highly flammable) because they do not generate electrical signal it is smaller and lighter than the copper cable hence ideal for space limited situation*

**e) Differentiate between a Hub and a Bridge as used in Networking (2 mrks)**

* *A Hub is a component that connects computers on a network and is able to relay signals from one computer to another on the same network.*
* *A Bridge selectively determines the appropriate network segment for which a message is meant for delivery through address filtering*

**f) The diagram below represents the a signal transmission from point A to point E. Name the parts labeled A, B, C, D, E (5 mrks)**

A

B

C

D

E

Down link

Satellite

Uplink

Earth station (transmitting station)

Earth station (receiving station)

1. **a) Binary systems has been used to develop most electronic devices. Give three advantages of using binary (3 mrks)**
* *It is difficult to develop devices that can understand or process natural languages directly it is easier to develop electrical circuits based on binary ON/OFF*
* *All forms of data can be represented in binary system format*
* *Binary devices are more reliable*
* *They became smaller in size*
* *They use less energy*

**b) Convert the following number systems (4 mrks)**

1. **37.62510 to binary**

*Using long division get the binary of 3710 =1001012*

*get the binary of the decimal by multiplying repeatedly by two i.e 0.62510=0.1012*

*Add the binary of the whole number and the decimal*

*1001012+0.1012=100101.1012*

1. BCD.EF16 to Octal

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| *HEXADECIMAL* | *B* | *C* | *D* | *E* | *F* |
| *BINARY* | *1011* | *1100* | *1101* | *1110* | *1111* |

|  |
| --- |
| *Group In terms of three 101,111,001,101.111,011,110* |

*To octal 5715.7368*

**c) Using twos complement, perform the following arithmetic opration leaving your answer in decimal notation (4 mrks)**

***3910 – 1910***

*using long division get the binary of:*

*3910 = 1001112*

*1910= 100112*

*write the binary of 1910 in 8-bits 1910= 000100112*

*ones complement of the binary of 1910=11101100*

*twos complement ones complement =11101101*

*add the binary of 3910 to the twos complement of 1910*

*11101101*

*+0100111*

*(1)00010100 ignore the overflow*

*(1x24)+(1x22)=2010*

**d) A MOKASA student was developing a file. List any four attributes that the student must consider in the development process (2 mrks)**

* *Key field*
* *The data type*
* *The lenghth of each field*
* *Back up and recovery strategies*
1. **a) A system analyst in changamwe prefers using phased change over to implement a new system. State three reasons for this preference (3 mrks)**
* *To enable the analyst to test the system in phases*
* *The operations and results of both systems are compare and evaluated*
* *Errors can be identified and corrected before the old system is abandoned*

**b) State three reasons why an organization may change an information system (3 mrks)**

* *New opportunities*
* *Incase of problems in the current system*
* *New directives*

**c) Different students were asked to state the characteristics of a system. The responses were as follows:**

**i) They are holistic**

**ii) They are open or closed systems**

1. **They have a boundary and environment.**

**Explain each of the above responses (3 mrks)**

* *Holistic system: the different components of a system are grouped together to make a whole*
* *Open or Closed: open system receives input from and gives out to the environment and can adopt to changes in the environment.*
* *Boundary and Environment: it is a space within which the component operates.*

 **e) Explain the following data collection stages as used in data processing (3 mrks)**

**i) Data preparation**

* *It is the process of converting data from source documents to machine readable format*

 **ii) Media conversion**

* *This is where the data is converted from one medium to another*

 **iii) Input validation**

* *It is the process taken during data entry to prevent wrong data from being processed by subjecting to validity checks*

 **f) State three ways a data entry clerk may use to reduce the threat to data integrity (3 mrks)**

* *Back up data*
* *Control access to data by enforcing security measures*
* *Design user interfaces that minimizes chances of invalid data entry*
* *Using error detection and correction software when transmitting data*
* *Using devices that directly capture data from the source*