**COMPUTER STUDIES**

**PAPER 1 MARKING SCHEME**

**FORM FOUR**

***Answer ALL questions in the spaces provided***

1. **Differentiate between embedded computer and dedicated computer (2mks)**
* *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 (2mks)**
* *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 (2mks)**
* *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** *Interrupt handling* (1mk)
1. **a) Differentiate between a flash memory and compact disk as used in computer storage devices**  (2 mks)

|  |  |
| --- | --- |
| **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 (3mks)**

* *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 (2mks)**
* *It determines the resolution and clarity of the monitor*
1. **Name four categories of input devices (2mks)**
* *Keying in devices*
* *Pointing devices*
* *Scanning devices*
* *Automated method*
1. **Name any two physical measures taken to protect a computer lab from unauthorized access. (2mks)**
* *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 (2mks)**
* *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 (2mks)**
* *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**  **(3mks)**
* *Eavesdropping: refers to tapping or listening into a communication channel 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 (2mks)**
* **Web portal**: it is a specialized 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 spreadsheets(2mrks)**
* *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: its the process of making a column 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 (4mks)**
* *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 (2mks)**
* *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 **(3mks)**

* *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 (3mks)**
* *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** *(4mks)*

Condition?

yes

No

statement

WHILE..DO Loop

Condition?

statements

Yes

No

REPEAT… UNTIL Loop

* *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 at least one execution of statements must be done*

b) Angela deposits 3500 shillings in a microfinance company at an interest rate of 20% per annum. At the end of each year, the interest earned is added to the deposit and the new amount becomes

the deposit of that year.

1. Write an algorithm for a program that would track the growth of the deposits over a period of six years. (5mks)

*Start*

*Input initial deposit*

 *Input interest rate*

 *Set deposit to initial deposit*

*Set year to 0*

 *While year ≤ 6 Do*

 *Interest = Deposit x Interest rate*

 *Total = Deposit + interest*

 *Deposit = Total*

 *Year = Year + 1*

 *END WHILE*

 *Print, deposit, year*

 *STOP*

(b) Draw a flowchart for above algorithms. (7mks)

Start

Input Deposit

Input interest rate

Principal = initial deposit year = 0

Print deposit

Total = deposit + interest

Deposit = total

Year = year + 1

Interest = deposit X interest rate

Print year

Stop

Is year ≤

1. **. a) Differentiate between a primary key and a foreign key as used in Database (2mks)**
* *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 (4mks)**

* *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 (3mks)**

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) kamau 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 (2mks)**
* *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 kamau observe before formatting his computer (1mk)**
* *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 (3mks)**

* *Hardware configuration*
* *The type of computer in terms of of size and make*
* *The application software intended for the computer*
* *User-friendliness*
* *Documentation available*
* *Cost of the operating system*
* *Reliability and security provided by the operating system*

**18.Virtual reality** –*is a condition in which a person becomes psychologically immersed in an artificial setting generated by a computer system*

*b) Application areas of virtual reality*

*-represents any three dimensional real objects such as buildings, landscape*

*-represent any three dimensional abstract objects*

*-entertainment*

*-training of medics, military among others*

*-assistance to the physically challenged people in the society*

c) **Head gear**-*it is equipment made up of two tiny displays and sound systems. These help to direct images and sound from the source to the eyes or ears, enabling the wearer to look through the virtual setting*

-**Body suite**-*this is made up of conductor wires wound in a rubber suit. The wires sense the body movement and convey the data into the system which in turn changes the position of the user in the virtual world.*

d) **Artificial Intelligence**-*is a branch of computer science that is concerned with developing artifacts with the ability to perform the same kind of functions that characterize human thought and actions*  (award 1mk for correct definition)

e) Components of an experts system

* *User interface-display screen that enable the user to interact with the system*
* *knowledge base- expert system’s data base of knowledge about a particular subject*
* *inference engine- software that controls search for knowledge in the knowledgebase and produce conlusions.*
1. **a) Binary systems has been used to develop most electronic devices. Give three advantages of using binary (3mks)**
* *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 (4mks)**

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 (4mks)**

***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) one of the student in the Diocese was developing a file. List any four attributes that the student must consider in the development process (2mks)**

**e). downloading** *– is a process of transferring infor mation from a remote computer to a local storage.*

**Hyperlink***- is a link infor m of text on a web page that causes onother web pages to open when the link is clicked****.***

* *Key field*
* *The data type*
* *The lenghth of each field*
* *Back up and recovery strategies*
1. **a)(3mks)**
* *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 (3mks)**

* *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 (3mks)**

* *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 (3mks)**

**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 (3mks)**

* *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*