**MARKING SCHEME 451/1**

* + - 1. **(a) List four types of publications that can be designed using desktop publishing software. (2 marks)**
* Posters
* Book publishing
* Banners
* Newsletters
* Magazines
* Card design

(any 4 @ ½ )

**(b) Explain the following graphic terms:**

1. **Rotate (1 mark)**
* To turn an image through an angle
1. **Crop (1 mark)**
* To remove the unwanted parts of a graphic
1. **List four input devices that capture data by way of scanning (2 marks)**
* Optical Mark Reader (OMR)
* Magnetic Ink Character Reader (MICR)
* Bar Code Reader
* Optical Character Reader (OCR)
1. Explain the following operating system functions:
* **Job scheduling (1 mark)**
	+ This is where jobs/tasks are assigned to the processor and main memory depending on their priority
* **Interrupt handling (1 mark)**
	+ Halting of other processes taken by the processor so as to attend to remote enquiries or halting a processor for another task to be performed.
1. **Distinguish between a formula and a function as used in spreadsheets. (2 marks**)

Formulae are user designed expressions that create a relationship between cells and return a value in a chosen cell while a function is an inbuilt predefined formula that the user can quickly use instead of having to create a new one every time they want to do a calculation.

1. **State two reasons why it is necessary to use standard furniture in a computer laboratory. (2 marks)**
* Prevents people from straining
* Table sizes allow all equipment to fit
* Optimization/utilization of room space
1. **When purchasing a computer, the clock speed, RAM size, Hard disk size and monitor size are often quoted. State the unit of measuring: (2 marks)**
2. **Clock speed -** hertz, gigahertz, megahertz
3. **RAM size -** bytes
4. **Hard disk size -** bytes/bits
5. **Monitor size -** inches or ”
6. **A computer user typed the name Kajiado as Kajaido and 8726 as 8126.**
7. **State the type of each error (1 mark)**
* Transposition error - Kajiado as Kajaido
* Transcription/misreading error - 8726 as 8126
1. **Explain how each error can be controlled (2 mark)**
* Proofreading
* Spellchecking
* Double entry
* Improve legibility
* Use of direct data capture devices
* Being careful when typing
* Validation of input data.

*(Any two @ 1 mark)*

1. **Explain the functions performed by the following; (3 marks)**
* **Control Unit**- coordinates instructions in the CPU
* **Arithmetic and Logic Unit** – used to perform arithmetic and logical operation
* **Main memory** – used for primary storage.
1. **Some of the basic factors one should consider when purchasing a computer include; cost, warranty among others. Explain three factors that determine the cost of a computer. (3marks)**
* The processing speed/power/capability of a computer – the higher the processing speed the higher the cost and vice versa
* Genuinity that is whether branded or clone. Branded computers are more expensive as they are reliable and always have after sale services while cloned computers are cheaper compared to their branded ones even if they have equal specifications.
* The physical size –smaller computers are more expensive than larger ones because of their portability and the superior technology used to make smaller computers without losing performance capabilities.
* Availability in the market – rare computer brands with high demand may cause the cost to be high while if they are very many with low demand the cost may be low.
* Condition of the computer that is used or first use – if computers are reconditioned their prices tend to be low compared to new ones that are being acquired for first use.

*(any 3 @ 1 mark)*

1. **List four stages in data collection. (2 marks)**
* Data creation
* Data transmission
* Data preparation for example verification and transcription
* Input validation
* Sorting
1. **(a) Name the two files commonly used in mail merge (1 mark)**
* Main/primary/standard document
* Data source/secondary

*(2 @ ½ mark)*

1. **Name and explain two types of dropcaps. (2 marks)**
* Dropped *½ mark*

The dropped character is within the paragraph

T

*½ mark* for description/illustrations

1. In Margin *½ mark*

The dropped character is within the left margin

T

*½ mark* for description/illustrations

**Differentiate between relative cell referencing and absolute cell referencing. (2 marks)**

* **Relative cell referencing**- there is use of a formula whose references keep changing automatically depending on their relative position when they are copied from one cell to another.
* **Absolute cell referencing** – the cell referenced are specific
1. **Describe the following types of relationships as used in database design. (4 marks)**
2. **One – to – one;**
* An association between two tables in which the primary key value of each record in the primary table corresponds to the value in the matching field or fields of one and only one record in the related table
1. **One – to – many.**
* An association between the tables in which the primary key value of each record in the primary table corresponds to the value in the matching field or fields of many records in the related table.
1. **(a)Describe the term data integrity. (2 marks)**

Data integrity refers to the accuracy and completeness of data entered in a computer or received from the information system.

**b) State four situations in which data may lose integrity (2 marks)**

* During transmission
* During data processing
* During data capture
* During collection
* During storage
1. **State two ways in which one can create a password which cannot be easily accessed by hackers. (2 marks)**
* A password with at least six characters
* A password with a mixture of letters and numbers
* Using both upper and lower case letters in the password

 **SECTION B**(60 marks)

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

1. **(a) State two qualities of a good pseudocode. (2 marks)**
* Should be short and clear/precise
* Should have start and end clearly shown
* Statements should be clearly defined
* Should depict the logical flow of solving the problem
* Should not be ambiguous
* Should be indented/neat/legible
1. **Distinguish between and assembler and an interpreter as used in programming.**

**(2 marks)**

**Assembler** – translator that converts assembly language codes into machine code

**Interpreter** – translators that convert high level language source code into machine code

1. **Explain two ways that may be used to identify the existence of errors in a program. (4 marks)**
* Desk check (dry run) - A manual technique for checking the logic of an algorithm
* Using the debugging tools that are provided in the computer
* Using test data that validate the desired input/output.
1. **Draw a programme flowchart that would accept three numbers and find their sum. If the sum is greater than 200, it adds 30 to the sum otherwise subtracts 20 from the sum. The program should then display the results. (7 marks)**

DISPLAY SUM

SUM > 200?

SUM = SUM - 20

SUM = SUM + 30

INPUT

A, B, C

TRUE

FALSE

1. **(a) The following are some of the phases in the system development life cycle (SDLC): system analysis, system design, system implementation, system review and maintenance. State four activities that are carried out during system implementation phase. (4 marks)**
* Installation of the system
* File conversions
* Staff training
* System change-over strategy adopted

*(4 @ 1 mark)*

**(b) Give three reasons why system maintenance phase is necessary in SDLC.**

 **(3 marks)**

* Correct the errors that may have escaped during the design
* To meet the changes in technology
* Changes in government policy
* Changes in operating environment e.g. the system evolving (e.g. when a newer version of the software is released.

*(Any 3 @ 1 mark)*

(**c) State two instances where observation is not a viable method of gathering information during system analysis stage. (2 marks)**

* Distance – when data is to be collected from far.
* If the people to be observed must be aware that they are being observed.
* When the situation is risky for the observer.

*(Any 2 @ 1 mark)*

**(d) Various considerations should be made during input design and output design. State two considerations for each case. (4 marks)**

**Input design**

* Data capture method
* Input interface, between the user and the system e.g. form
* Volume of input
* Frequency of input

**Output design**

* Form of output designed e.g. hard/soft copy
* Output layout
* Purpose of output

**(e) State two reasons why an organization may use other strategies of software acquisition other than developing their own. (2 marks)**

* Constrained by time
* Constrained by cost
* Constrained by human resource
* Legal requirement
1. **(a) State three standard coding schemes used in computing and electronic systems.**

 **(3 marks)**

* Binary Coded Decimal (BCD) (4 bits)
* American Standard Code for Information Interchange (ASCII)
* Extended BCD Interchange Code (EBCDIC)
* Standard BCD

*(Any 3 x 1)*

**(b) Convert the following numbers:**

1. 110.1012  to decimal; (3 marks)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 1 | 1 | 0 | . | 1 | 0 | 1 |
| 22 | 21 | 20 | . | 2-1 | 2-2 | 2-3 |

4+2+0+0.5+0+0.125 = 6.62510

1. 12.687510 to binary;

 (4 marks)

|  |  |  |  |
| --- | --- | --- | --- |
| $$\frac{12}{2}$$ | = | 6 | R 0 |
| $$\frac{6}{2}$$ | = | 3 | R 0 |
| $$\frac{3}{2}$$ | = | 1 | R 1 |
| $$\frac{1}{2}$$ | = | 0 | R 1 |

= 11002

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 0.6875 | × | 2 | = | 1.375 | 1 |
| 0.375 | × | 2 | = | 0.750 | 0 |
| 0.750 | × | 2 | = | 1.500 | 1 |
| 0.500 | × | 2 | = | 1.000 | 1 |

= 0.10112

12.687510 to binary is 1100.10112

**(c) Subtract 110.012 from 11001.01012  (2 marks)**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 1 | 0 | 0 | 1 | . | 0 | 1 | 0 | 1 |
| - |  | 1 | 1 | 0 | . | 0 | 1 | 0 | 0 |
| 1 | 0 | 0 | 1 | 1 | . | 0 | 0 | 0 | 1 |

= 10011.00012

**(d) Using twos complement, perform the following binary arithmetic leaving the answer in binary notation.**

**11012 - 1001012  (3 marks)**

Twos complement of 1001012  is

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 0 | 1 | 1 | 0 | 1 | 0 |
|  | + |  |  |  | 1 |
| 0 | 1 | 1 | 0 | 1 | 1 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | 0 | 0 | 1 | 1 | 0 | 1 |
| + | 0 | 1 | 1 | 0 | 1 | 1 |
|  | 1 | 0 | 1 | 0 | 0 | 0 |

 = 1010002

1. **(a) Using two examples, explain the term field properties as used in database design.**

 **(2 marks)**

Specify details related to fields and table entries expected e.g. field size, format, decimal places, input mask e.t.c.

**b) Below is an extract from a hospital database.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Patient No.** | **Name**  | **Date registered** | **Amount paid** | **Remarks** |
| **LDK/001** | **Mathew Olang** | **04/05/08** | **2500.00** | **To go for x – ray** |
| **LDK/004** | **Joy Chelimo** | **07/06/08** | **1200.0** | **Medicine to be Ordered** |
| **LDK/008** | **John Kamau** | **09/08/08** | **3500.00** | **To be admitted for further check up** |
| **LDK/002** | **Garald Wasike** | **02/04/05** | **800.00** | **To come back for review.** |

1. **State with reasons the most suitable data types for the following fields: (8 marks)**
2. **Patient No** – Data type – Text

Reasons – it combines both numeric and alphanumeric characters.

1. **Date registered**  – Data type – Date

Reasons – it can be manipulated mathematically, e.g number of months can be calculated between two dates.

1. **Amount paid** - Data type - Currency/Numeric

Reasons – it can be manipulated mathematically

1. Remarks - Data type - Memo

Reasons – the content may be lengthy e.g. giving a paragraph.

1. **Which would be the most appropriate primary key field for the above table?**

**(1 mark)**

1. Patient No.
2. **What is the purpose of a primary key field in database design? (1 mark)**
* Identify each of the records in the database
* Useful when you want to create a relationship between more than one table
* Make access to database records faster e.g. when sorting.
1. **Describe how information about patients who registered after 09/08/06 can be extracted from the database. (3 marks)**
* Create a query
* Apply the criteria on the date field.
* Give the criteria date registered >09/08/06
1. **(a) (i) What is an information system? (1 mark)**

Information system is an arrangement of people, data, processes, communication and IT that interact to support problem solving.

**(ii) State two roles of an information system. (2 marks**)

* improve day–to-day operation
* Support problem solving
* Support decision making needs for management
* Data capture
* Processing data into information
* Data security
* Storing of data/information
1. **Describe the following file organisation methods:**
2. **Random file organization (2 marks)**
* stored and retrieved according to their disk address which is generated by use of an algorithm or formula i.e stored randomly, accessed randomly
1. **Sequential file organization (2 marks)**
* Method of restoring or retrieving information that requires the program to start reading at the beginning and continue until it finds the desired data.
1. **The following records were extracted from two files that contained student data**

**File A:**

**Reg No. Student Name sex Address**

**3002 Christine Onyancha F Box 8932 Kisii**

**3008 John Otieno M Box 7222 Nairobi**

**3001 Amina Muthee F Box 1243 Butere**

**3015 Peter Musyoki M Box 6621 Nyeri**

**File B:**

**Reg. No Fee Payments Date of Payment**

**3002 1000 04/09/2011**

**3008 1500 03/09/2011**

**3001 900 02/09/2011**

**3015 400 21/09/2011**

1. **Which of the two files above represents a Transaction file? 1 mark)**

File B

1. **Give a reason for your answer in c(i) above (1 mark)**
* Transaction file: it contains data which is regularly added

Has date/fee payment

1. **Name the other type of file represented above (1 mark)**

Master file: It contains records that do not change regularly like in file A

1. **An airline uses an information system whereby if a passenger at station A books a plane seat, this transaction is immediately shown at stations A and B such that no other passenger can book the same seat.**
2. **Identify this data processing mode (1 mark)**

Real time processing

1. State two advantages and two disadvantages of this processing mode. (4 marks)

**Advantages**

* Information is readily available for instant decision making
* Updating is done instantly when transactions occurs
* Auditing is easier
* It is accurate
* Prevent double booking

**Disadvantages**

* Complex – difficult to configure/set-up
* Expensive to acquire and maintain
* Errors that occur are difficult to correct