**MARKING SCHEME**

451/1

COMPUTER STUDIES

PAPER 1

JULY 2024

2 ½ HOURS

**CHAMPION JET EVALUATION TERM TWO 2024**

**FORM FOUR**

Kenya Certificate of Secondary Education (KCSE)

***SECTION A (40 MARKS).***

ANSWER ALL QUESTIONS IN THIS SECTION

1**. Today, many companies are re-engineering their products to implement the USB connection to the computer. State any two reasons for this drift. (2marks)**

* Faster data transfer over short distance
* To avoid having a large number of ports serving the same purpose
* To avoid the worry of their product not being bought due to lack of appropriate port on computer for USB that’s commonly used nowadays.

2**. Explain each of the following terms as used in computing**. (3marks)

(i) **Data capture**.

* Getting data in to the machine readable form. Entering data into the computer for processing.

(ii) **Data verification**

* The process of checking data accuracy

(iii**) Data validation**

* It is checking data for reasonableness, accuracy and completeness using validation program before data is passed for processing.

**3. Many people now use plastic cards to withdraw money from their banks. State Three advantages of these cards to the user (3marks)**

* Saves time
* It is secure
* Convenient since it offers 24hrs service
* Used in any branch of the same bank
* Accurate
* Offer self service

**4. With specific examples explain the difference between each of the following: (4 marks)**

(i( Application packages and Utility software

* Are designed to help the user perform specific task eg Word processor, Spreadsheet while Utility are programs that help manage the computer systems e.g. to copy and to delete. Example is Operating system.

**(Mark jointly, both sides must be correct)**

**(ii)Data privacy and data security**

Privacy is recognition that certain data belongs to an individual and it should not be disclosed to any one without owner’s knowledge while Data security is to protect data from illegal access or from accidents or deliberate modification.

**NB:(Mark jointly, both sides must be correct)**

**5(a) what is layering in desktop publishing? (1 mark)**

* The arrangement of objects on top of each other with the one on the top being on the first layer

(b) **Why is layering a useful feature in desktop publisher especially when the user is manipulating text and graphic object. (1 mark)**

* Allows the user to make the graphical object layer transparent in order to make the text in layer behind the object visible.

6**. State Three risks posed by improper cabling in computer laboratory (3 marks)**

* Risk of electric shocks to the users
* Risk of fire outbreak in the computer lab
* Risks of stripping and injuries.
* Power of interruptions caused by stumbling on the cables.

**7. State Two advantages of laser printer (2 marks)**

* Produce excellent quality print
* Fast in speed
* Quiet
* Handle a wide range of font faces and graphics.

**8. Give three effects of a server crash in a computer networks setup. (3 marks)**

* Difficult to share resources
* Loss of data and software
* No network connection
* Difficult to monitor the operations

**9. Differentiate between a switch and a hub in networking. (2 marks)**

* A switch forwards the data packet directly to the address node using the point-to-point transmission method. A hub broadcast the data packets to all the computers on the network

10. **State Two reasons why organization may opt for in-house software rather than vendor-off-the shelf software (2marks)**

* Designed to meet users need.
* It can be upgraded easily as per the need of organization
* Less costly in training.
* Improves a chance of adopting new system.
* Users can give their view during the design stage

11**State Two characteristics of soft system (2 mark)**

* Systems whose boundaries keep on changing
* Have goals and objectives that usually conflict
* One cannot exactly define the exact measure of performance \*1 mark any of the above

**12. Explain any two types of errors that are likely to exist in a computer program? (4 marks)**

* Syntax error: grammar of programming language not followed
* Logical error: program runs but the wrong thing e.g. multiples to give wrong product
* User unacceptability: Program runs but does not meet users requirements
* Run time error: Abnormal unexpected stoppages at the time of running/during execution e.g. on encountering something like 75/0

**13. State Two ways in which ICT can be used in banks for daily operation (2 marks)**

* Records keeping
* Opening bank accounts
* Electronic money transfer

**14.Difference between real-time system and online systems (2marks)**

* Real-time: A situation where a computer processes the incoming data as soon as it occurs updates the transmission file and gives an immediate response that would affect the events as they happen. i.e. airline booking
* Online-system:-Data processed is immediately received at a terminal or online input device attached to the computer, i.e. banking.

15.a) Using **twoscomplementsubtracts 24 from 29 (4 marks)**

**Solution**

29+ (-24)

29-11101 ½ mark

24-11000 ½ mark

 NOT 11000=00111…..1mark

11101

 +

 00111

 1)001002………….1mark

add 1

**Answer=001012 1mark**

***SECTION B(60 MARKS)***

***Answer question 16 and any other THREE questions from this section***

16. (i) use pseudo code below to answer the question that follows

START

 T=1

 READ N

 X=1

 X=X+1

 UNTIL X=N+1

PRINT T

STOP

(a)**Use a flowchart to represent the pseudo code shown above (7 MARKS)**

X=1

T=1

READ N

START

T=T\*X

X=X+1

X=N+1

No

Yes

PRINT N

STOP

(b)**What would the flowchart generate as Output if the value of N at input is: (4mks?)**

**(i) 5 (Show the working)**

|  |  |  |
| --- | --- | --- |
| T | X | N |
| 1 | 1 | 5 |
| 1 | 2 |  |
| 2 | 3 |  |
| 6 | 4 |  |
| 24 | 5 |  |
| 120 | 6 |  |

**T=120**

**(ii) 1 (Show working)**

|  |  |  |
| --- | --- | --- |
| T | X | N |
| 1 | 1 | 1 |
| 1 | 2 |  |

**T=1**

**(c)State Four guidelines for drawing a flowchart (4marks)**

* Use the standard flowchart symbol
* The general direction of flow of any flowchart is from top to bottom and right to left.
* There should be only one entity/starting point and one exit point of program algorithm.
* Use the correct symbol at each stage in the flowchart.
* The logical flow should be clearly shown using arrows.

**17(a) State one application area in computing where real time processing is more appropriate than batch processing stating reason. (2 marks**)

* Reservation system
* Online booking system
* Transaction

(b**)(i)State Three reasons most hospitals are changing from manual system to a computer-based system in storing patient records. (3 marks)**

* To save on storage space
* To ease file retrieval
* Computerized system reduces level of errors
* To enhance data security

**(ii)State any three methods that can be used to organize files on a storage media. (3marks)**

* Random /Direct access
* Sequential
* Serial
* Indexed-sequential

(c**) (i)Define the term disk partitioning (1mark)**

* The process of sub dividing a large physical storage media into two or more partitions called logical drives that are treated as independent drives.

**(ii)State Two advantages of disk partitioning (2marks**)

* One can run more than one operating system on the system
* Files can be separated to minimize corruption risk
* Storing frequently used programs and accessed data nearby to improve performance

**(iii)Explain why operating system must be installed in the computer before installing any other program on the computer. (2marks)**

* Because it is the operating system that controls execution of programs to be installed in the computer hence no any other program that can be installed in the computer.

(iv)**State Four resources that are controlled by operating system (2marks)**

* Input devices
* Output devices
* Main memory
* Hard disk
* CPU

**18Information system is known to be the driving force for any organization. The success of an organization depends on the design and implementation of its information system.**

1. **Explain any TWO components of an information system (4marks)**
* People-The users of the system
* Hardware-Physical devices for data processing
* Software-Set of information processing instructions
* Data-The raw data to be processed
* Network-

(b) State **three** benefits of training staff using multimedia training package. (3 marks).

* There is consistency in presentation
* Have more impact since simulate real sitation
* Can be delivered any where
* The trainer does not have to travel

(c**)Distinguish between the direct and phased changeover strategies (2marks)**

* In direct conversion, the old system is completely and immediately replaced by the new system while in phased conversion only a few departments, branch offices or plant locations at a time are converted.

(d)**Describe the systems characteristics listed below: (2marks)**

**(i)System entropy**

* The decaying process of the system after serving for long

**(ii)The interdependency between subsystems**

* Subsystems of a system are dependent on one another as they should work together to achieve the objective of organization as well as share information during processing by providing output for input in another subsystem.

**(iii). Control.**

This a mechanism that helps to check if the system is achieving it objective or not

(**e)State any Three reasons that may lead to information system change in an organization (3marks)**

* Complaints from customers
* Errors in the system
* Lack of security
* High cost of maintenance
* Slow in processing
* New management
* New directives

**19. After data has been processed, it is important to keep it somewhere either permanently or semi permanently for future use.**

(a**)Briefly describe how data is stored/represented on a solid-state storage device. (2marks)**

* Data is stored electronically as charge/voltage in the microchips where by a charged cell may represent 1 while an uncharged cell may represent 0

(b)**State any two advantages of solid-state storage device.**

* It is long lasting due to lack of movable parts that undergoes wear to tear.
* It is affected by dust
* It has a high destiny

(c**)Distinguish between BCD and EBCDIC coding scheme**

* In BCD representation each digit of a number is represented as its four-bit binary code while EBCDDIC uses eight bits to represent each character and its therefore able to represent 256 different characters.

(d**)Using twos complement subtracts 43.2510 from 18.37510 giving your answer any decimal notation. (5marks)**

43.2510= 101011.01…… ½ mark

18.37510= 10010.011………. ½ mark

 010010.011 – 101011.010

 1sc compl 010100.101…… ½ mark

 2s compl 010100.110…… ½ mark

Add 010010.011+010100.110=100111.001…… 1 mark

To 1sc compl 011000.110…………………. ½ mark

2scompl 01100.111…….. ½ mark

24.87510…….. 1mark

***(e) Convert 101011.110112 to its equivalent hexadecimal number (1mark)***

0010/1011.1101/1000………2A.D8

(f) Determine the value of X in the equation; 10011012-X10(3marks)

10011012-110102=X10

110112=X10

(1\*32)+(1\*16)+(1\*2)+(1\*1)

5110=X10

20**. Study the following spreadsheet extract and answer the questions that follows:**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **A** | **B** | **C** | **D** | **E** | **F** | **G** |
| **1** | **Student name** | **Maths** | **Eng** | **Comp** | **Total** | **Grade** |  |
| **2** | Jane Ndoo | 24 | 22 | 52 |  |  |  |
| **3** | Maureen Kamau | 60 | 17 | 71 |  |  |  |
| **4** | James Kariuki | 24 | 41 | 10 |  |  |  |
| **5** | Mary AnnMuthoni | 52 | 63 | 81 |  |  |  |

(i)**Write down the formula that can be used to calculate the Total marks of James Kariuki. (2marks)**

=B4+C4+D4ORSUM (B4:D4)

**(ii) Write down the formula that can be used to calculate the Total marks for students with more than 50 marks in computer (2marks)**

=SUMIF (B2:B5,’’>=50’’)

**(iii)Write a formula that can be used to count the Total number of students who scored computer marks more than 50 (2marks)**

=COUNTIF (D2:D5,’’>50’’)

(iv)**Write a formula to sum up the Total marks for the computer students (2marks)**

=SUM (D2:D5)

(v)**State the functions that can be used to group and sum up the Total mark for students who scored 24 in mathematics (1marks)**

* Subtotal function

(**vi Write down the formula that can be used on cell F2 to grade the students. Use the following grading system. (4marks)**

>=80 A

>=70 B

>=60 C

>=50 D

>=30 E

=IF(F2>=80,’’A’’,IF(F2>=70,’’B’’,IF(F2>=60,”C’’,IF(F2>=50,’’D’’,IF(F2>=30,”E’’)))))

**(vii)What is automatic recalculation in spreadsheet? (2mark)**

It is inbuilt features in most spreadsheets which automatically readjust the results of a formula if at all any value have been changed in the spreadsheet.