KASSU JOINT EXAMINATION 2023

451/1 COMPUTER STUDIES

1. Give reasons why the following fire extinguishers are not recommended for use in the computer laboratory. (2 Marks)

a. Liquid-based fire extinguisher	b. Powder-based fire extinguisher
It causes rusting to metallic parts	Increases friction and wear of movable parts
Causes corrosion of computer components	Particles may causes disk crash during read/write operations
Causes short circuit	Particles may clog devices like keyboard

2. Differentiate between embedded and integrated computers (2 Marks)

An embedded computer is a special purpose computer used inside another device and is usually dedicated to specific functions while integrated computer is a general purpose computer that is connected externally to a machine to control the operations of the machine when performing an activity.

3. Describe the following terminologies as used in reference to visual display unit. (4 Marks)

   a. Resolution

Refers to the number of pixels per inch on the screen/ the clarity of images displayed on the screen measured in dpi.

   b. Color depth

Refers to the number of colors that can be displayed by a pixel measured in bits

4. Describe the following components of a spreadsheet: (3 Marks)

   a. Worksheet

Is a grid made up of rows and columns where actual data values are entered.

   b. Database

Is a collection of related data items organized so as to provide easy access and control for data.

   c. Graphs

Is a data analysis pictorial representation of data on a worksheet.

5. a. State two threats to data and information. (1 Mark)

- *Computer viruses*
- *Theft*
- *Power failure*
- *Unauthorized access*

   b. List four types of risks posed by computer viruses to the computer systems. (2 Marks)

- *Destructions of computer files and programs*
- *Uses up computer memory space hence slowing down its performance causing system crash*
- *Changes color of the display*
- *Causes boot failure*
- *Delete or modify data, information, file on storage media/memory during normal program operations.*
- *Systematically destroy all the data in the computer memory*

c. State two measures against unauthorized access. (2 Marks)

- *Enforce data information access control policies on all employees to control access to data.*
- *Keep computer rooms locked when not in use*
- *Reinforce weak access points; doors, windows, roofs i.e burglar proofing*
- *Use file password to prevent persons getting access to electronic files*
- *Enforce network security measures such as firewalls*
- *Encrypt data and information during transmission*
- *Perform frequent audit trials to identify threats*

6. Automated production is an effect of ICT on employment, state three advantages of automated production. (3 Marks)
    - *Increased efficiency due to balancing of workload and production capacity*
    - *Improved customer service due to adequate and high quality goods produced on time.*
    - *Efficient utilization of resources i.e raw materials, personnel and equipments*

7. Describe the following terms used in reference to the CPU: (3 Marks)
    a. Fetch
    - *To get instructions from the main memory on an input device*
    b. Decode
    - *It involves determining what the instructions is all about e,g to add, to compute*
    c. Execute
    - *It means to activate the appropriate circuits to complete an instruction or carry out the operations required by the instructions*

8. Explain three functions of an information system. (3 Marks)

    - *Helps in decision making by collecting appropriate data, analyzing the data and generating reports to be used in decision making.*
    - *It facilitates sharing of information since information is found in a central database.*
    - *It supports information processing as data is collected, processed and distributed*

9. Describe the following terms as used in system development: (4 Marks)

    i. Control
    - *Refers to method by which a system adopts to the changes in the environment to give the expected output.*
    ii. System entropy
    - *It is a state whereby the system slowly becomes useless to the user either due to improvement of technology.*

10. Define the term hot- swapping (1 Mark)
    - *It means that a drive can be removed or inserted while the computer is still on/ the hard disk or optical drive can be removed or attached to the motherboard while the computer is still on*

11. State two functions of the power supply unit (2 Marks)
    - *Transforms the AC power from the source to DC required by each internal component.*
    - *Supply power to all the internal components of the computer*

12. Define peripheral device interfacing (2 Marks)
    It refers to connecting peripheral devices to a computer through ports using either cables or wireless technology

13. Explain the following terms as used in the word processing. (2 Marks)

i. Footnote

  - *Additional piece of information printed at bottom of page*

ii. Endnote

  - *Notes collected under separate heading at end of chapter in a document*

14. a) Explain a situation when each of the following Desktop Publishing programs features may be used when creating a document   (2 marks)

(i) Crop

  - *used when handling a graphic and there is a need to remove some of the portions in the graphic*

(ii) Transparency
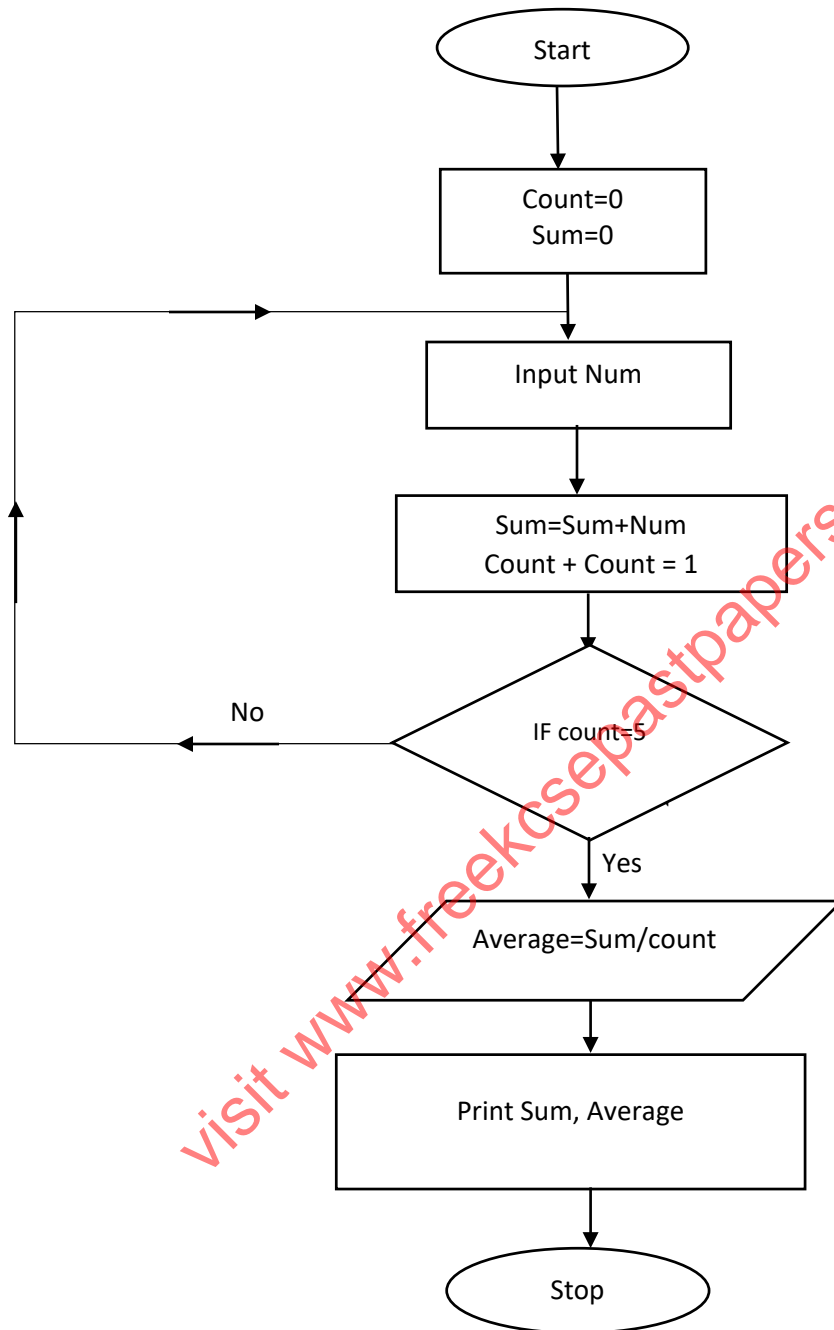
  - *Used when there is a need to make background of a graphic visible when layering objects.*

15. Name any two types of non-printable guides in DTP.   (2 Marks)

  - *Ruler guides.*
  - *Column guides.*
  - *Margin guides.*

16. A program is expected to accept 10 numbers calculate their sum and average and produce the output. Below is a flowchart that was used by KASSU students to represent the program. Study the flowchart below and answer the questions that follow:

```
                    ┌─────────────┐
                    (    Start    )
                    └─────────────┘
                           │
                           ▼
                    ┌─────────────┐
                    │  Count=0    │
                    │  Sum=0      │
                    └─────────────┘
                           │
         ┌─────────────────┤
         │                 ▼
         │          ┌─────────────┐
         │          │  Input Num  │
         │          └─────────────┘
         │                 │
         │                 ▼
         │          ┌─────────────────┐
         │          │  Sum=Sum+Num    │
         │          │  Count + Count = 1│
         │          └─────────────────┘
         │                 │
         │                 ▼
         │  No        ╱─────────────╲
         └──────────◄   IF count=5   ►
                     ╲─────────────╱
                           │ Yes
                           ▼
                  ╱──────────────────╱
                 ╱  Average=Sum/count╱
                ╱──────────────────╱
                           │
                           ▼
                  ┌──────────────────┐
                  │ Print Sum, Average│
                  └──────────────────┘
                           │
                           ▼
                    ┌─────────────┐
                    (    Stop     )
                    └─────────────┘
```

a) The flowchart has errors in it. Identify any four errors that were made in the flowchart stating how each of them should be corrected. (4 marks)

- *The program only counts 5 numbers not 10 as stated….. Change decision loop to **is count =10***
- *Input of SUM: Wrong diagram used*
- *Calculation of average done in a wrong input/output symbol*
- *Print of AVERAGE and SUM: Wrong diagram*

……………………………………………………………………………………………………

b) Write a pseudocode for the corrected version of the above flowchart. (7 marks)

………
………
………
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……………………………………………………………………………………………

c) i) Give any two examples of fourth generation languages. (2 Marks)

- *Visual basic,*
- *Delphi pascal,*
- *visual COBOL,*

ii) List two factors that need to be considered when selecting a programming language. (2 marks)

- ✓ *The availability of the relevant translator*
- ✓ *Whether the programmer is familiar with the language*
- ✓ *Ease of learning and use*
- ✓ *Purpose of the program, i.e., application areas such as education, business, scientific, etc.*

  Execution time
- ✓ *Applications that require quick response are best programmed in machine code or assembly language. High-level languages are not suitable for such application because, they take long to be translated & executed.*

  Development time
- ✓ ***Development time** is the time a programmer takes to write and run a program.*

✓ *High-level languages are easy to read, understand and develop; hence, they require less development time. Machine code & Assembly languages are relatively difficult to read, understand and develop; hence, they are time-consuming.*

Popularity
✓ *The language selected should be suitable and/or successful in the market with respect to the problems to be solved.*

Documentation
✓ *It should have accompanying documentation (descriptions) on how to use the language or maintain the programs written in the language.*

Maintenance
✓ *Programs are developed to solve specific problems, and the problems keep on changing; hence, the programs are also changed to perform the new functions.*

Program maintenance is the activity of incorporating more routines onto the program, modifying the existing routines or removing the obsolete routines to make the program adapt to a functionally enhanced environment.

✓ *The maintenance is made easier if the language used is easy to read and understand.*

Availability of skilled programmers
✓ *The language selected should have a pool of readily available programmers to ease the programming activity, and reduce development time.*

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17. a) Outline two disadvantages of questionnaires as a data gathering techniques. (2 marks)

- *slow*
- *requires expertise to design*
- *some questions can be easily misunderstood hence ambiquous reponses may be received*
- *analysis requires a lot of time*

b) State three activities that take place during system implementation phase of SDLC. (3 marks)

- *hardware, software selection, acquisition and installation*

- *user training*

- *file creation/ conversion*

- *system changeover*

c) Define the term Feasibility study as used in system development. (1 mark)

- *This is a special study carried out to establish the costs and benefits of a proposed new system.*

d. Perform the following conversions

  i. Convert 111.010_2 to decimal number. (3 marks)

  $(111.010)_2 = (1 \times 2^2) + (1 \times 2^1) + (1 \times 2^0) + (0 \times 2^{-1}) + (1 \times 2^{-2}) + (0 \times 2^{-3}) = (7.25)_{10}$
  $(4+2+1). (0+0.25+0) = 7.25_{10}$

  ii. $17\frac{4}{5}$ (base 10) to binary (3 marks)

iii. Distinguish between BCD and EBCDIC coding schemes (2 mark)

BCD

✓ *(BCD) is a system of writing numerals that assigns a **four**-digit binary code to each digit 0 through 9 in a decimal (base-10) numeral.*

EBCDIC

✓ *EBCDIC is an **8**-bit binary code for numeric and alphanumeric characters.*
✓ *It is a coding representation in which symbols, letters and numbers are presented in binary language*

e. Give two reasons why a firm may decide to computerize its operations (1 mark)

- *Handling of errors easily*
- *Easy storage and retrieval of information*
- *Increased efficiency*
- *Higher quality work*
- *Reduced cost.*

18. a. Describe the following data types as used in spreadsheet. (4 Marks)
    i. Labels
- *Refers to text and alphanumeric characters entered in a cell that cannot be manipulated mathematically. They are mostly used as row and column headers*
    ii. Values
- *These are numbers that be manipulated mathematically*
    iii. Formulas
- *Refers to user defined mathematical expressions that creates relationships between cell and returns a value at a chosen cell.*
    iv. Range
- *Is a block or rectangular group of cells specified by the address of its top left and bottom right cells that is manipulated as a unit.*

b. Differentiate between logical files and physical files. (4 Marks)

- *A logical file is viewed in terms of WHAT data items it contains and the details of WHAT processing operations may be performed on the data items while physical file is viewed in terms of HOW data is stored on a storage media and HOW the processing operations are made possible.*

c. i. Define serial file organization (1 Mark)
- *In these file organization method, records in a file are stored and accessed one after the other.*
    ii. Name any two disadvantages of serial file organization (2 Marks)
- *Cumbersome to search for specific records because of linear storage of data*

- *Wastage of space in form of IRG*
- *Does not support modern high speed requirement for quick record access.*

d. Give two advantages of using a template in a word processor (2 Marks)

- *Consistency: all documents made using a template will match its layout exactly*
- *Efficiency- only need to create a template once*
- *Saves time*
- *Produces quality documents*

e. State two components found in an electronic Point-of-sale terminal. (2 Marks)

- *Terminal, e.g. Console, which is connected to the main computer*
- *Monitor*
- *Printer*
- *Barcode reader/ scanner*
- *PDQ (pretty damned quick/ process data quick) machine*

19.a. Describe the following types of software (3 Marks)

- *Proprietary software **Is a type of software whose source code is hidden from the users***.

ii. Shareware

- *Is a type of software that comprises of licensed software that allow users to freely make and distribute copies of the software or*
- *These are software given to user to use for some time and are required to pay for them to continue using them*
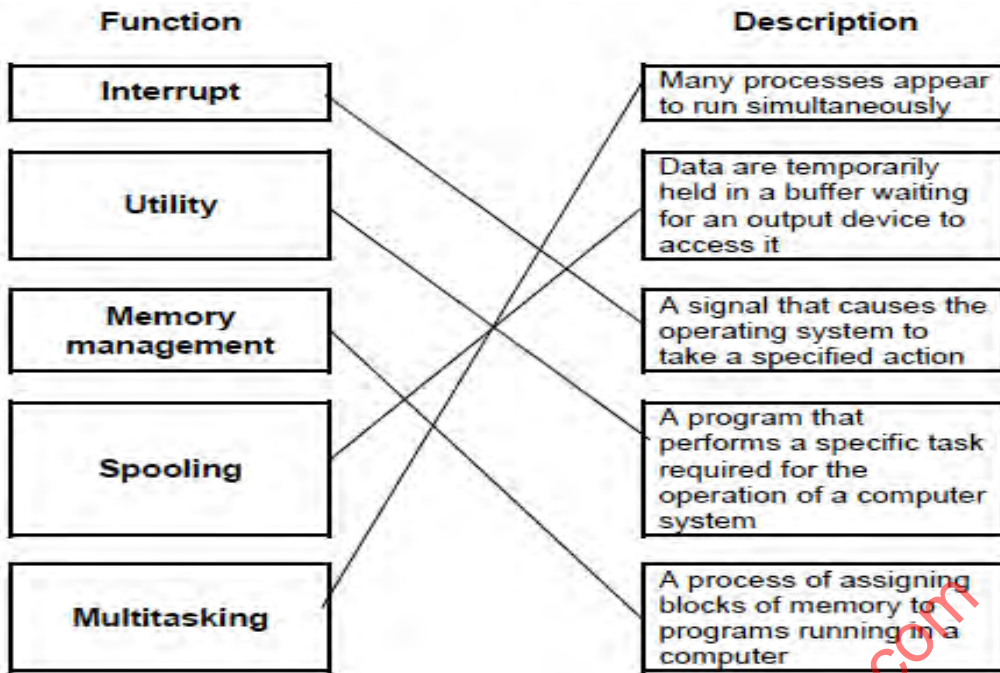
iii. Freeware

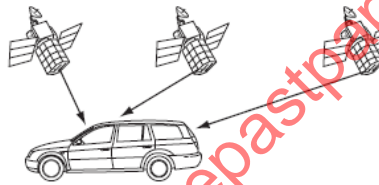- *Are software products that are made freely available to the users for download and users*

b. i, Define the term deadlock as used in operating system. (1 Mark)

Deadlock is a situation where a particular job holds a requested resource and fails to release it, yet it is requesting for a resource held by another job.

ii. The diagram shows five operating system functions and five descriptions. Draw a line between each operating system function and its description. (4mks)

Function		Description
Interrupt		Many processes appear to run simultaneously
Utility		Data are temporarily held in a buffer waiting for an output device to access it
Memory management		A signal that causes the operating system to take a specified action
Spooling		A program that performs a specific task required for the operation of a computer system
Multitasking		A process of assigning blocks of memory to programs running in a computer

c. Satellite navigation systems are used to give the vehicle driver directions.

i. How does the system know the exact position of the vehicle? (3 Marks)

- *satellites transmit signals to computer/ satellite navigation in car*
- *satellite navigation system in car receives these signals*
- *each satellite transmits data indicating location and time*
- *satellite navigation system car calculates position based on at least 3 satellites*
- *satellite navigation system combines satellite information with mapping info*

ii. Give two advantages to the driver using this system. (2 Marks)

- *no need to read/own maps*
- *driver doesn't need to memorise route*
- *can give useful information such as location of garages/speed cameras/points of*
- *interest/traffic congestion*
- *allows driver to concentrate on driving (therefore safer)*
- *can find shortest/fastest route*
- *easier to re-route in case of road closures, etc.*
- *updateable*

iii. Give two problems associated with satellite navigation systems. (2 Marks)

- *some stored maps out of date (instructions go to incorrect roads)*
- *inaccurate positioning*
- *loss of signal*
- *errors in original data/setting up*
- *sends vehicles down inappropriate routes*
- *over reliance by driver on the satellite navigation*

20. a. Define the following terms

i. Trouble shooting (2 Marks)

Process of diagnosing and trying to fix hardware and software problems

ii. Installation

Process of copying program files onto the hard disk

b. Describe any two types of files used in operating systems. (2 Marks)

- *System files- contain information that is critical for the operation of the computer*
- *Application files-they hold programs and are executable*
- *Data files- they contain user specific data*

c. A database table, DEVICE, has been set up to record the electronic equipment used in a small business

Device ID	Device Type	User	Purchase Date	Purchase Price ($)	Portable
3	Desktop	Alan Swales	14/02/2017	1350.00	N
4	Laptop	Chantel Law	01/02/2016	1460.00	Y
5	Tablet	Abdula Saud	31/12/2016	1000.00	Y
6	Desktop	Abdula Saud	14/03/2017	1000.00	N
7	Laptop	Alan Swales	15/03/2016	1700.00	Y
8	Tablet	Taona Jaji	16/12/2016	470.00	Y

(a) The query-by-example grid below selects certain records.

Field:	User	Portable	Purchase Price ($)
Table:	DEVICE	DEVICE	DEVICE
Sort:	Ascending		
Show:	✓	☐	☐
Criteria:		Y	>1000
or:			

Show what would be the output from the query-by-example. (2 Marks)

Alan Swales   Chantel Law   (correct data and correct order)

(b) Complete the query-by-example grid below to select all Desktop devices that were either purchased before 31/12/2016 or cost under $1000. Only show the Device ID and Device Type.

(5 Marks)

Field:	Device ID	Device Type	Purchase Date	Purchase Price ($)
Table:	DEVICE	DEVICE	DEVICE	DEVICE
Sort:				
Show:	☑	☑	☐	☐
Criteria:		Like 'Desktop'	<#31/12/2016#	
or:				<1000

1 mark for each correct column

c. Differentiate between a primary key and an index key (2 Marks)

- *Primary key- is a field that enforces uniqueness in a table so that one record is not entered twice*

- *Index key- used to speed up search and sort operations in a table*

d. State the title of the ICT personnel in charge of regularly updating the organization's website.

Webmaster (1 Mark)

e. What program is the personnel above likely to use to accomplish his tasks? (1 Mark)

Webscripting languages e.g. html, java script, python, etc