

NAME: Amos 2024

Combination				Personal No			

S850/1
Subsidiary ICT
Paper 1
Aug./Sept. 2024,
2 ½ hours



MATIGO EXAMINATIONS BOARD

Uganda Advanced Certificate of Examination

SUBSIDIARY ICT
Theory

Paper 1

2 hours 30 minutes

INSTRUCTIONS TO CANDIDATES:

Attempt all questions in this paper

The paper is made up of 20 equally weighted structured questions each carrying 5 marks

Write your answers in the spaces provided.

No additional materials (answer sheets) are provided

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1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total

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1. (a) In the modern world, every utility delivery company is switching from use analog systems to digital systems. Briefly explain the term digital migration. (02 marks)

This is the technological transformation from the use of analog computing devices to use of digital computing devices. | This is the transition from analogue signal broadcasting to digital signal broadcasting.

(b) Why do you think there is a need for these companies to switch from analog systems to digital systems? - To meet the technological development of era

- To widen on the coverage/boundary of service access.
To enable faster data sharing.

To provide access to improved shared services

To improve on the quality of information sharing.

To increase on variety of accessed services

2. (a) What are the roles of the following professionals according to their job description.

(i) ICT instructor

(02 marks)

- Facilitates and provides training about the use of Management of ICT.

- Provides knowledge about ICT and related fields

(ii) System analyst

(02 marks)

Determines the requirements of a given computer system and also determines the performance of a given system.

(iii) Software engineer

(01 mark)

Helps to design and develop a computer/Information system by determining software/Program requirement.

3. (a) Which laboratory equipments perform the following routine maintenance in the Computer laboratory? (05 marks)

(i) Regulates the room temperature.

Air Conditioner / Cooling Fan.

- (ii) Protects user's sight from being damaged by strong light rays from the monitor.

Antiglare screen.

- (iii) Regulates fluctuations in voltage.

Uninterruptible Power supply (UPS)

- (iv) Control voltage spikes.

Stabilizer.

- (v) Provides alternative source of power when power goes off abruptly.

An Uninterruptible power supply (UPS)

4. (a) What is network topology?

(01 mark)

This is the layout of computing devices in a network system.

- (b) A large company has a LAN. The manager of the company wants to replace it with WLAN. Explain the difference between a LAN and a WLAN, giving an advantage and disadvantage of a WLAN.

(04 marks)

LAN is a type of computer network that covers a small geographical area for example buildings close to each other (school). While WLAN is a type of computer network that uses wireless connection configured within a given area for example Workstation Wireless fidelity.

Advantages of WLAN: Has faster resource sharing.

Enables wider resource sharing.

-A variety of resources can be shared.

5. (a) Distinguish between mechanical mice and cordless mice.

(03 marks)

Mechanical → This is a type of mouse that uses physical mechanism to detect movement. It is connected using USB or PS2 port on the computer system unit. While

Cordless → This is a type of mouse that connects by radio waves / Bluetooth / Wireless that is used to make movements.

Cordless use wireless receiver that is plugged on a computer using a USB port.

(b) What are the three common key board layouts used today. (02 marks)

- Qwerty.
- Azerty.
- Qwertz.
- Dvorak.

6. Multi-national companies often use video conferencing rather than face to face meetings

(a) Give two advantages of video conferencing (02 marks)

- provides more proof in communication since shared information can be recorded and stored. (MORE BENEFIT)
- Has wider coverage in communication.
- Facilitates communication during harsh situations such as during epidemics.

(b) Give three disadvantages of video conferencing (03 marks)

- Requires high initial costs. Such as buying computers/ computing device to use. (BENEFIT)
- Requires a lot of computer literacy.

7. (a) Differentiate between syntax and a language processor. (02 marks)

Syntax → This is the grammar for a given computer program.

These are rules that govern the structure of code with in a computer program. While

(b) Identify three examples of the third generation language. (3 marks)

- C
- Basic (beginners All symbolic code)
- Java
- C#
- Pascal
- C++

8. (a) Explain what is meant by virtual reality. (02 marks)

This is a computer simulated / created environment that seems to be real environment due to responding according to the surrounding.

- More convenient way of Communication
- Communication can take place at all times.
- Accommodates number of participants at the same time.
- Facilitates faster research in case of need to make references
- Saves time since communication can be retrieved at any time or is free.

6b) Limited / dependent on internet connection which makes it unreliable.

7a) Language processor → These translate the source code from one programming language to another.

→ These are tools that are used to determine errors within a computer program.

→ ~~These are~~ tool that translate high level language into machine code that a computer can understand.

(b) Name three pieces of hardware used in virtual reality systems. (03 marks)

- 3D Headphones

- 3D graphics Card

- 3D sound card

- Data gloves

9. Briefly explain the following terms used on the internet. (5 marks)

(a) Blog

An online platform where users post contents related to a particular topic however does not allow editing its content.

(b) Wiki - Wiki is a collaborative online workspace accessed via a web browser.

This is a type of website that allows/used to publish, edit, manage, access and share information for example Wikipedia.

(c) Instant messaging

This is an internet facility that enables exchange of text messages in real time.

(d) Discussion group

This is an online platform where individuals share ideas on the same aspect and posts are in a reverse chronological order.

(e) E mail

This is an internet service that facilitates sending and receiving of text messages and file attachments.

10. (a) Differentiate between asynchronous and synchronous transmission techniques (03 marks)

Asynchronous → This is a mode of data transfer where a single bit of data is transmitted at a time. ^{data from computer to computer} While synchronous is a mode of data transfer where multiple blocks of data are transmitted at the same time. (Phone calls)

- (b) Identify the mode of transmission the following devices represent. (02 marks)

- (i) Walkie talkie..... Half duplex.
- (ii) TV remote to TV set..... Simplex.

11. (a) Define the concept of digital forensics (01 mark)

This is a branch of science that deals with collecting, analysing, managing and recovering data on digital devices.

- (b) Identify the three branches of digital forensics. (03 marks)

- Computer Forensics

- Network Forensics

- Mobile device Forensics

- Database Forensics

12. (a) Define an expert system in relation to the use of artificial intelligence. (02 marks)

This is a computer program that uses artificial intelligence to simulate or make judgement and exhibit behaviour of human being.

- (b) State the role of the following components of an expert system. (03 marks)

- (i) User interface

Helps to input queries in a readable format which is passed to the interface Engine.

(ii) Inference engine

Helps to interpret and evaluate the facts in the knowledge base order to determine the answer.

(iii) Knowledge base

Helps to organise and collect facts about the system domain.

13. (a) Briefly explain the following rights that accrue to the creations of intellect.

(i) Patent rights

(01 mark)

These are exclusive rights give to an individual to sell, use or produce a given product without interference from others.

(ii) Trade marks

(01 mark)

This is unique symbol, identifier that differentiates one products from others. An identifier such as symbol, phrase that differentiates a given product from that of others.

(ii) Trade secrets

(02 marks)

This is a technique used by a company or an individual to limit changes and duplication for example software source codes.

(b) Why do you think it is still a myth in Uganda to realize intellectual property rights implemented?

- Limited education levels and awareness.
- Continuous decrease in quality over time.
- Piracy challenges.
- Limited number of legally registered entities.
- Unfair registration costs for intellectual property.

14. (a) How does the IPOS cycle differ from the machine cycle?

(02 marks)

Information Processing system is the process that involves data entry, Comparison, Processing, storage and generation of feedback/output while.

(b) Briefly explain the following steps of the machine cycle

(03 marks)

(i) Fetch

This is the process of retrieving / collecting / capturing an instruction into memory.

(ii) Decode

This is the process of comparing the captured instruction to determine the operation to be executed.

(iii) Execute

This is the process of working upon a captured instruction.

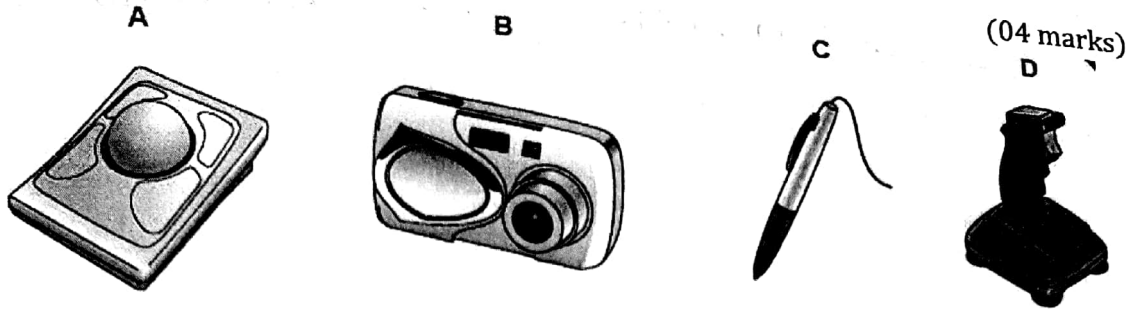
15. (a) What are input devices?

(01 marks)

This is a hardware that is used to feed / enter instruction in a computer system.
This is a device that is used to enter / feed data in a computer.

Machine cycle is a sequence of operations
the central processing unit goes to turn
an instruction into a desired output.

(b) Name the following input devices.



A. Scanner.
B. Digital Camera.
C. Light Pen.
D. Joystick.

16. Briefly explain the following terms in relation to data communication.

(i) Domain name system

(01 mark)

This is a string of unique text characters that helps to establish mapping / connection relation between numerical values and hosts on a network.

(ii) IP address

(01 mark)

This is a unique identification number assigned to every computing device on a network (Internet).

(iii) Web server

(01 mark)

This is a computer system capable of delivering web content to end-users over Internet via a web browser.

(iv) Internet protocol

(01 mark)

These are a set of rules and guidelines that govern exchange of information / resources over a network system.

17. (a) Differentiate between data integrity and data redundancy.

(02 marks)

Data integrity is the process of ensuring accuracy, consistency, completeness and validity in an organisation of data. While data redundancy is process of (Backup).

- (b) Identify the field properties that can effect the following settings below:

- (i) Control the length of the text to be in put in a field

Field length.

- (ii) Displays pre-defined format for the data to be entered in a field

Validation text / Validation rule.

- (iii) Specifies a pattern of all data to be entered in a particular field

Input mask.

18. (a) Write the following computer abbreviations in full

(02 marks)

- (i) USB.

Universal Serial Bus.

- (ii) UPS

Uninterruptible power supply.

- (b) A parent is planning to produce a number of rules to ensure that his children follow which using a computer at home. Write down three rules that he could include in his list.

(03 marks)

- Internet facility is strictly for study purposes.
- Always to handle devices with care.
- Always use soft dry cloth while cleaning the computer and its components.
- Always avoid users to get into contact with liquids.
- Qualifiers - secure device usage.

keeping data in two or more forms in order to
improve data security.

19. Briefly identify 5 application programs known to you and state the use of each.

(05marks)

- Electronic spreadsheet, helps to organise data in rows and column to perform operation.
- Microsoft power point, Helps to organise information in form of slides to present an idea to a group of audience.

20. A farmer has purchased a computerised milking system for her cows. She has asked a systems analyst to create a database to store details of the cow being milked.

Examples of the details of the cows which will be stored are:

Breed of cow	Date of birth	Weight of cow	Average milk yield	Animal Number
Holstein	25/02/2017	725.9	24.5	998/2017
Ayrshire	15/03/2016	715.0	20.1	972/2016
Jersey	25/02/2017	732.7	25.0	971/2016
Holstein	10/10/2016	715.0	25.0	765/2016

- (a) State which field would be the most appropriate for the primary key? (01 mark)

Animal Number.

- (b) A validation check is used when entering the animal number into the database. Name and describe the most appropriate validation check that could be applied to this field. (02 marks)

When a given value be too, is entered, display an error message.

- (c) Complete the following table by entering the most appropriate data type for each field. For any numeric field, specify the type of number. (02 marks)

Field Name	Data Type
Breed of cow	Short Text
Date of birth	Date / time

END

(+256780413120)

- Microsoft Office Word - Helps to create, format, documents that contains text and graphics.
- Database (Ms Access) - Helps to organize data in a way that allows access and retrieval.
- Electronic publisher - Helps to create documents that contains text and brilliant colours.