

# **COMPUTER STUDIES**

## **FORM 4**

### **PAPER 1**

### **MARKING SCHEME**

**1. Define the term artificial intelligence. (1mk)**

- Depicting human like behaviour.

**2. List three roles of a system analyst. (3mks)**

- Reviewing the current manual system
- Working with programmers to construct and test the system.
- Co-ordinating training of users of the new system.

**3. Outline three ways which IEBC will use technology to ensure free and fair elections.**

**(3mks)**

- I. Bio metrics
- II. Use of password to access servers
- III. Controlled access privileges.

**4. Write the following acronyms in full. (2mks)**

(I) WIFI - wireless fidelity

(II) HDMI - High Definition Multimedia Interface.

**5. a) List two reasons why USB interface has become popular than other types . (2mks)**

- Flexibility
- Compatibility
- Can connect more than

**b) Give three disadvantages of using serial file organization. (3mks)**

- Cumbersome to search for specific record
- Wastage of space
- Does not support modern high speed requirements.

**6. Name three common types of malicious programs that are harmful to computers. (3mks)**

- Virus
- Worm
- Back doors
- Trojan horse

**7. Define the term dead lock as used in operating systems. (1mk)**

A situation where a particular job holds a requested resource and refuses to release it yet it is requesting for another resource.

**8. Give any three categories of functions that are available in ms-excel. (3mks)**

- Mathematical functions
- Logical
- Statistical
- Date & time

**9. Differentiate between count and count if functions as used in ms-excel. (2mks)**

Count - Counts cells with values

Count if - conditionally counts cells with values.

**10. Explain why liquid based and powder based fire extinguisher are discouraged in a computer laboratory. (2mks)**

- Liquid - cause corrosion
  - short circuit
- Powder - clogging of computer movable parts

**11. Explain the following terms as used in computer crimes.**

- Piracy - illegal copying
- Industrial espionage - spying on a competitor

**12. List three advantages of using fibre optic cables in networking. (3mks)**

- Immunize to EMI and eaves dropping
- Fast
- Supports high bandwidth
- Suitable backbone because they do not suffer from low attenuation
- Suitable for use in highly flammable systems.
- Smaller and lighter than copper.

**13. Explain any two database models. (4mks)**

- ❖ Relational - records are stored in tables
- ❖ Hierarchical - single path used to access records
- ❖ Network model - several links used to access one record.

**14. a) Give three ways in which ICT can be used to conserve forests. (3mks)**

- ❖ Surveillance
- ❖ Research
- ❖ Creating awareness.

**b) Give three factors to consider when selecting ICT related careers. (3mks)**

- Cost of training
- Location of the institution
- Physical look and management of the college
- Whether it offers ICT courses recognized
- Certification both locally or internationally.

**15. List four sub categories of system software. (4mks)**

- ❖ Operating system
- ❖ Firmware
- ❖ Utility ware
- ❖ Networking software

**16. a) List two examples of (2mks)**

**(i) Third generation languages**

- FORTRAN
- COBOL
- Basic
- C
- Ada

**(ii) Object oriented programming languages. (2mks)**

- C++
- Java
- Small talk

**b) Differentiate between source code and object code. (2mks)**

- Source code - a program which has not been translated that is in program editor window.
- Object code is a program that has been translated.

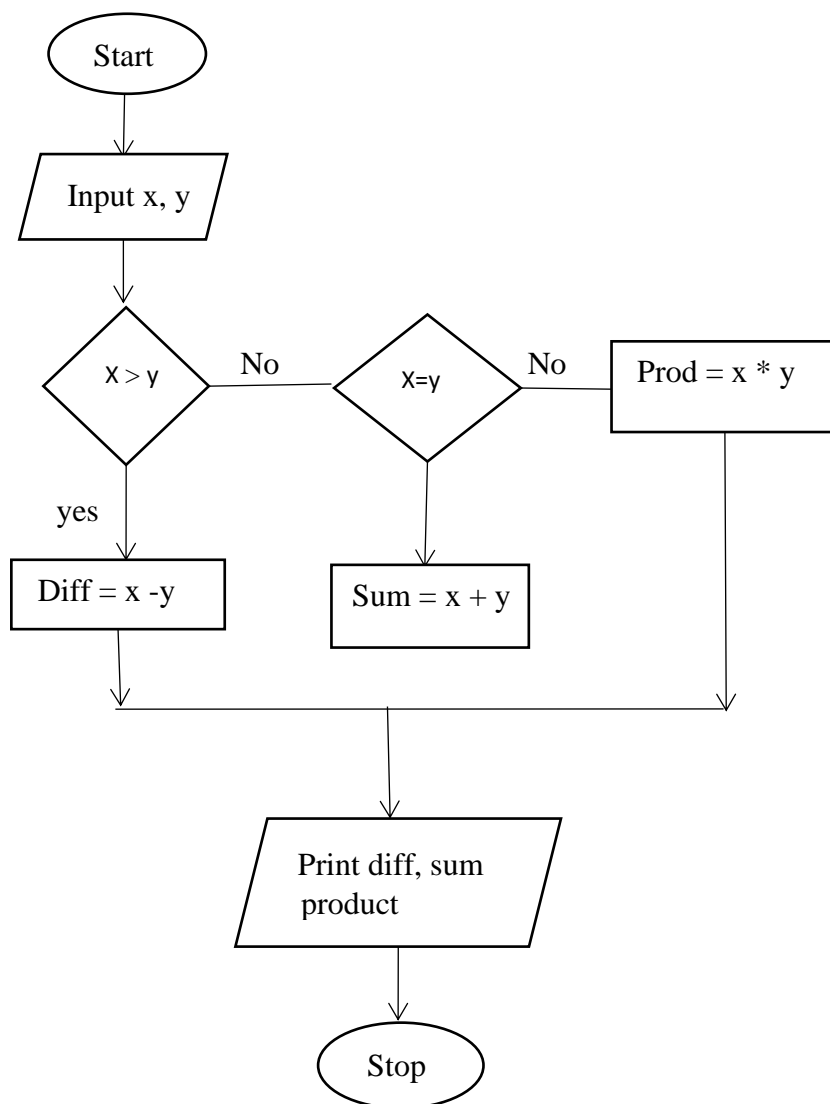
**c) Draw a flow chart that will take two numeric values X and Y . compare the two numbers to give the following output:**

**If X is more than Y, the program should compute the difference of the two numbers.**

**If X is less than Y, the program should compute the sum of the two numbers.**

**If X is equal to Y, the program should compute the product of the two numbers.**

**(7mks)**



**List two repetitive control structures.**

**(2mks)**

For....do loop

While ...do

Repeat....until

**17. a) Differentiate between the following as used in data communication.**

**(i) Base band and broadband**

Baseband - signal generate and fed into the transmission medium directly without modulation.

Broadband - signal is sent over the transmission medium using a particular frequency.

**(ii) Multiplexing and demultiplexing**

Multiplexing - processing of sending multiple data signals through the same medium.

Demultiplexing - is the process of splitting multiplexed signal back into multiple channels.

**b) ABC company intends to start their operations across all the East African countries.**

**(i) Recommend to them the most ideal computer network that they should use. (1mk)**

- Wide area network

**(ii) List three challenges the company is likely to encounter while using the network.**

**(3mks)**

- Compute crimes - hacking, sabotaging etc.
- Over reliance of nilco
- Expenses due to the new running and installation costs.
- Some employees will require to be trained.

**(iii) With an example, state three networking elements that the company will need for them to implement the network. (6mks)**

Data communication media e.g bound, unbound media

Communication devices e.g data ternal equipment I.e computer, mobile phones etc.

Data circuit terminating equipment I.e modems, switches and routers.

Network software e.g network operating system protocols

**c) Give one advantage of using unbound media for networking. (1mk)**

Flexibility

Covers a wide physical location

Cheap

**18. Study the worksheet below and answer the questions that follow.**

1	A	B	C	D	E	F
2	<b>SKY WAYS AGENCIES</b>					
3	Product	Region 1	Region 2	Regions 3	Region 4	TOTAL
4	Rexona	3400	3700	4000	4100	
5	Lifeboy	2500	2600	2100	2500	
6	Omo	6000	6100	6300	1600	
7	Ushindi	1200	1500	1400	6400	
8	Carmel	7000	6900	7200	8000	
9	Total					
10	Maximum					
11	Average					

**a) Write functions that can be entered to get total, maximum and average of each region. (3mks)**

Total = Sum(B4:B8)

Maximum = Max(B4:B8)

Average = Average(B4:B8)

**b) Write down the function that returns the number of sales in the four regions whose value is greater than or equal to 2000. (2mks)**

= Sum IF(B4: E4, ">2000")

c) The prices for region 4 were reduced with n% value which was placed in cell C1. Write a formulae to calculate the new price of product Rexona and applied to other product in the same region.

(3mks)

=E4 - (E4 \* & C & 13)

d) Differentiate between stroke and fill as used in DTP.

(2mks)

- Stroke - outline

- Fill - shading

● Define the term text wrap .

(1mk)

- Refers to moving text around the object.

(i) Give four ways you can wrap text on an object.

(4mks)

● Infront

● Back /behind

● Tight

● Square

● Through

19. State three ways in which a signed binary number.

(a) Can be represented

(3mks)

● Prefixing a sign bit

● Using ones complement

● Using twos complement.

b) Convert the following numbers into binary form

(i)  $247_{10}$

(2mks)

2	2 4 7
2	2 2 3 R 1
2	1 1 1 R 1
2	55 R 1
2	27 R 1
2	23 R 1

2	11 R 1
2	5 R 1
2	2 R 1
2	1 R 0
	0 R 1

$$247_{10} = 101111111_2$$

(ii)  $9AC_{16}$

(2mks)

9      A      C

1001   1010   1100

$$9 A C_{16} = 100110101100_2$$

c) Using twos complements compute  $27_{10} - 13_{10}$  and leave your answer in binary form

(use 8 bits)

(3mks)

27<sub>10</sub>

+ (-13<sub>10</sub>)

bitnot of 13

$$\begin{array}{r|l} 2 & 27 \\ 2 & 13 \text{ R } 1 \\ 2 & 6 \text{ R } 1 \\ 2 & 3 \text{ R } 0 \\ 2 & 1 \text{ R } 1 \end{array} \quad \begin{array}{l} 27_{10} = 11011_2 \\ \uparrow \\ 13_{10} = 1101_2 \end{array}$$
$$\begin{array}{r} 11110010 \\ 00011011 \\ + 11110010 \\ \hline (1) 00001101_2 \end{array}$$

**d) Differentiate between logical and physical files.**

(2mks)

Logical the file is viewed in terms of data items it contain and details of processing operations that can be performed on the data items while physical file is one that is viewed in terms of actual data stored on storage media.

**e) Explain three parameters that can be used to measure data integrity.**

(3mks)

- Accuracy - how close an approximation is to the actual value.
- Timeliness - relative accuracy of data in respect to the current state for which it is needed.
- Relevance - the data entered must be relevant to the processing needs and expectations.

**20. a) i) State the importance of information (fact finding) in system development. (1mk)**

- So as to understand the problem and finding out any constraints that may limit the solution.

**ii) State any two advantages and two disadvantages of using interview method when used for information gathering. (4mks)**

**Advantages**

- You can seek for clarification in case the response is not clear.
- You can read non-verbal question.
- You can cover much more than what you had initially planned.
- The interviewee can offer solutions to the current problem.

**Disadvantages**

- It is expensive
- Time consuming
- Some respondents may not be free to open up.

**b) Explain three system development theories and methods.**

(6mks)

**i) Traditional approach.**

This approach relies on the skills and experience of individual staff members. There is no formal documented methodology to be followed.

**ii) Rapid application development.(RAD)**

- This in a highly interactive approach that uses prototyping and active user involvement.

**iii) Structured system development**

- This follows sequential stages I.e waterfall, IV-model, spiral and interactive model
- c) Your school wishes to replace the original system with an information system.**
- i) With a reason , advice the school on the best change over strategy to implement. (2mks)**
- Parallel - safe and secure
  - Phased - safe and secure
  - Direct changeover - saves time and resources.
- ii) Give two challenges the school may encounter while implementing the new system.(2mks)**
- Loss of data
  - High cost of operations and implementation.