# KENYA NATIONAL EXAMINATION COUNCIL
# REVISION MOCK EXAMS 2016
## TOP NATIONAL SCHOOLS

**NAIROBI SCHOOL**

**COMPUTER STUDIES**

**PAPER 1**

**MARKING SCHEME**

**SCHOOLS NET KENYA**
Osiligi House, Opposite KCB, Ground Floor
Off Magadi Road, Ongata Rongai | Tel: 0711 88 22 27
E-mail:infosnkenya@gmail.com | Website: www.schoolsnetkenya.co

# NAIROBI SCHOOL KCSE TRIAL AND PRACTICE EXAM 2016

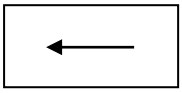
**COMPUTER STUDIES**

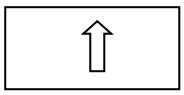
**451/1 PAPER 1**

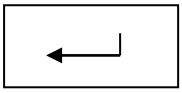
**MARKING SCHEME**

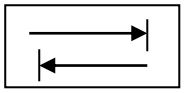
**1.** State any two peripheral devices that are powered by the system unit. (1 mk)
-Mouse
-keyboard

2. The following are symbols of some keys found on the keyboard. Name the keys represented by the symbols. ( 2 mks)


Back space


Shift


Enter/ Return


Tab

3) Explain any THREE functions of system software in a computer (3mks)
-Supports the development of other application software.
-Supports the execution of other application software.
-Monitors the effective use of various hardware resources e.g. CPU, memory, peripherals etc.
-Communicates and controls the operation of peripheral devices such as a printer.
-Performs a variety of system utility functions

4. As a computer student you have been asked to assist in buying an input device. State any four factors to consider when buying input devices. (4 mks)
   - Type of data to be input
   - Speed
   - Accuracy of the input device
   - Cost of the device
   - Availability of the device

5. i. The arithmetic logic unit, the **control** unit and the main memory use electrical pathways or links called buses. State and explain the three types of buses. (3 mks)
   - **control bus**- pathway for all timing and controlling of functions sent by the control unit to other parts of the system
   - **Address bus**- used to locate the storage position in memory where the next data to be processed is held.
   - **Data bus**- this is where actual data transfer takes place.

   ii. What is the role of special purpose memories in the microprocessor? (1 mk)
-To enhance its performance

6. Differentiate between primary memory and secondary memory. (3 mks)

| **Primary Memory** | **Secondary Memory** |
|---|---|
| Directly accessible by the CPU | Not directly accessible by the CPU |
| Very expensive | Less expensive |
| Low capacities | High capacities |
| Fast access time | Slower access time |

7. Citing relevant examples state two advantages of integrated software as opposed to single purpose. (2 mks)

-Takes shorter time to install
-The integrated software are compatible and have common features so easy to learn

8. a. Define the term mail merging (1 mark)
- Process of generating personalized documents or letters by combining main document with an existing data source.

b. Name **two** files that are created in mail merging process (1 marks)
-Primary file / Main document
-Secondary file/ Data source
-Merged file

9. (a) Distinguish between a workbook and a worksheet as used in spreadsheets (2mks)
- Worksheet: A component in which data values are entered. It contains rows and columns.
- Workbook: A group or collection of worksheets.

(b) What is the meaning of "what if analysis" with respect to spreadsheet? (1mk)
- It's a feature used in forecasting where, the probability of changing or altering of values is measured to predict likely future occurrences.

10. Define the following terms in relation to internet (2 mks)
i). Downloading
-Transferring information from a remote computer to a local storage.
ii). Hyperlink
-text or picture on an electronic document that causes other web pages to open when the link is clicked.

11. Benjos was instructed by his teacher while typing a Microsoft word document to replace all the occurrences of the word MS with Microsoft. Highlight the steps to do this (3mks)
- Click edit menu then replace command
-The find and replace dialog box appears
-In the find what box type MS
-In the replace with box type Microsoft
-Click find next button
-Click the replace all button

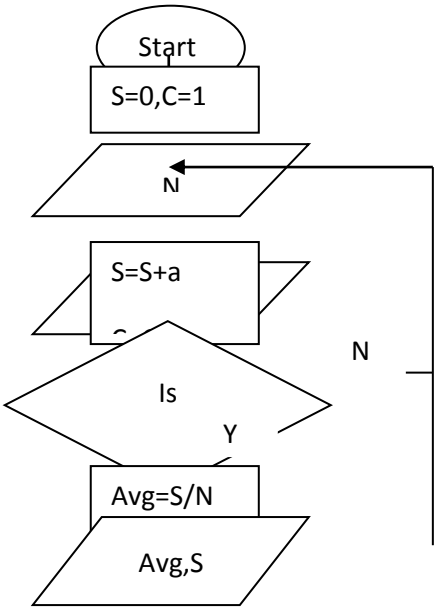
12. What is the difference between logical and physical file? (2 mks)
Logical file is viewed in terms of what data items it contains and details of what processing operations may be performed on the data items while a physical file is one that is viewed in terms of how data is stored in storage media and how the processing operations are made possible.

13. Explain any three types of computer processing files. (6 mks)
Character- is the smallest element in a computer file and refers to a letter, number or symbol that can be entered.
Fields – is a single character or collection of characters that represents a single piece of data.
Record- is a collection of related fields that represent a single entity.

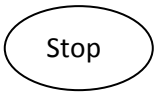
14. Give a reason why HTML is not considered as a true programming language. (1 mk)
-It does not have the declaration part and control structures.

15. (a) Define the following computer crimes
(i) Piracy (lmk)
-Making illegal copies of copyrighted software, information or data.
(ii) Industrial espionage (lmk)
-Spying on your competitor to get information that you can use to counter or finish the competitor.

16. Draw a flowchart for a program that is to prompt for N numbers, accumulate the sum and them find the average. The output is the accumulated totals and the average.




Start
Set S=0
C=1
Print "Enter N"
Read N
Print "Enter New No"
Read a
Calculate S=s+a
C=S+1
Until C=N
Avg=S/N
Print Avg, S
Stop




(c) Explain **three** types of control structures use in programming. (3mks)

-Sequence
-Selection/decision
-Iteration/looping

17. (a) i. Subtract $110_2$ from $11010_2$ (1mk)

$11010_2$
$\underline{\quad 110_2}$
**$10100_2$**

ii. Find the sum of binary number $101.101_2$ and $110.100_2$ (1mk)

$101.101_2$
$\underline{110.100_2}$
**$1100.001_2$**

(b) i. Convert binary number $11010110.1001_2$ into octal number. (1mk)

| 11 | 010 | 110 | 100 | 1 |
|---|---|---|---|---|
| 3 | 2 | 6 . 4 | 1 | $_8$ |

ii. Convert binary number $11010110.1001_2$ into hexadecimal number. (1 mark)

| 1101 | 0110 | . | 1001 |
|---|---|---|---|
| D | 6 | . | 9 $_{16}$ |

(c) Convert the following numbers to their decimal equivalent

i. $11.011_2$ (2 marks)

$(2^0 \times 1) + (2^1 \times 1) + (2^{-1} \times 0) + (2^{-2} \times 1) + (2^{-3} \times 1)$

$= 1 + 2 + 0 + 0.25 + 0.125$

$= 3.375_{10}$

ii. $0.11011_2$ (2 marks)

$0. (2^{-1} \times 1) + (2^{-2} \times 1) + (2^{-3} \times 0) + (2^{-4} \times 1) + (2^{-5} \times 1)$

$0. 5 + 0.25 + 0.0 + 0.0625 + 0.03125$

$=0.84375_{10}$

(d) i. Convert $3BD_{16}$ to Octal. (3mks)

A = 10 = 1010

B = 11 = 1011

C = 12 = 1100

D = 13 = 1101 ✓1mk

| 001 | 010 | 101 | 110 | 001 | 101 |
|---|---|---|---|---|---|
| 1 | 2 | 5 | 7 | 1 | 5 |

✓1mk

Therefore $ABCD_{16} = 125715_8$ ✓1mk

ii. Using one's complement, calculate $5_{10} - 9_{10}$. use six bit in your calculation. (3mks)

Conversion

$5_{10} = 000101_2$

$9_{10} = 001001_2$ ✓1mk

$-9_{10}$: ones complement = 110110

Adding 000101 ✓1mk

$\underline{110110}$ +

$\underline{111011_2}$ ✓1mk

(e) State the following types of transcription errors: (2 marks)

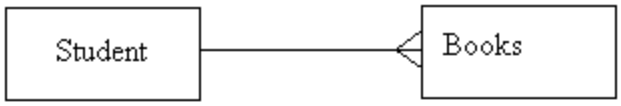
i. 3455 instead of 3456

3455 instead of 3456 ( misreading)

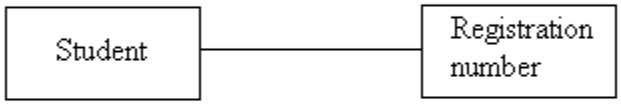
ii. Simth instead of Smith

Simth instead of smith (Transposition)

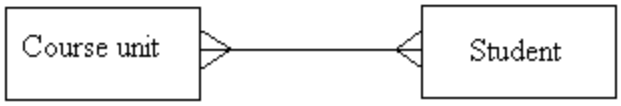
18. (a) State and explain the following types of relationship as used in database design

i. 

(2 marks)

ii. 

(2 marks)

iii. 

(2 marks)

For the above figure:

i. one to many relationship. Means a student can borrow many books e.g in a library

ii. One to one relationship. Implies that a student has one registration number

iii. Many to many relationship. Implies that there are many course units that can be taken by many students

(b) i. Explain the difference between primary key and an index key as used in database application (2 marks)

A primary key is a unique identifier for a database record while index key

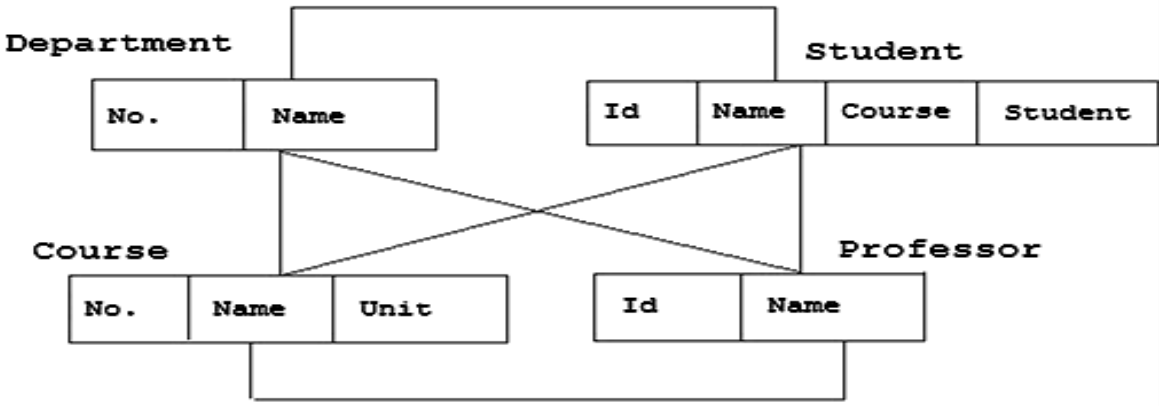
An index is a key used to more quickly find rows in the table based on the values which are part of the index

ii. Outline the functions of a primary key (2 marks)

- Uniquely identifies a record
- It prevents null entry
- Eliminates data redunduncy

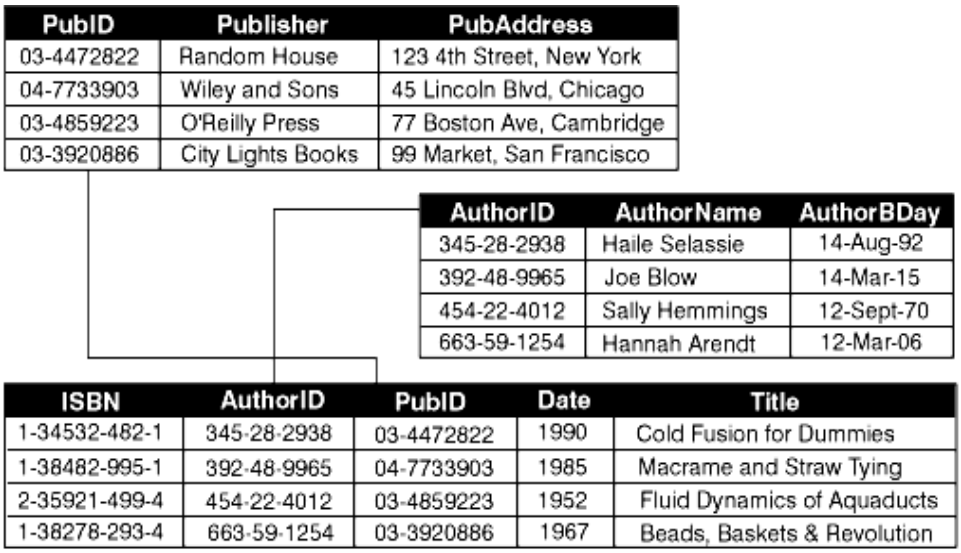
(c) Describe the following types of database model

i. Network model (2 marks)




In the network model, entieies are organized ub which some entities can be accessed through several path

ii. Relational model



| PubID | Publisher | PubAddress |
|---|---|---|
| 03-4472822 | Random House | 123 4th Street, New York |
| 04-7733903 | Wiley and Sons | 45 Lincoln Blvd, Chicago |
| 03-4859223 | O'Reilly Press | 77 Boston Ave, Cambridge |
| 03-3920886 | City Lights Books | 99 Market, San Francisco |

| AuthorID | AuthorName | AuthorBDay |
|---|---|---|
| 345-28-2938 | Haile Selassie | 14-Aug-92 |
| 392-48-9965 | Joe Blow | 14-Mar-15 |
| 454-22-4012 | Sally Hemmings | 12-Sept-70 |
| 663-59-1254 | Hannah Arendt | 12-Mar-06 |

| ISBN | AuthorID | PubID | Date | Title |
|---|---|---|---|---|
| 1-34532-482-1 | 345-28-2938 | 03-4472822 | 1990 | Cold Fusion for Dummies |
| 1-38482-995-1 | 392-48-9965 | 04-7733903 | 1985 | Macrame and Straw Tying |
| 2-35921-499-4 | 454-22-4012 | 03-4859223 | 1952 | Fluid Dynamics of Aquaducts |
| 1-38278-293-4 | 663-59-1254 | 03-3920886 | 1967 | Beads, Baskets & Revolution |

In this type of organization, related data items are stored together in a relations or tables.
Relationship can be created between tables such that a record or records from one table relates to another or other records in another table.

19. (a) i. What is an operating system? (1 mark)

- This is a suit of programs that provide a facilities that enable the other programs to use the hardware in a safe and controlled way
- Is a suit of programs that takes over the operation of the computer to the extent of being able to allow a number of programs to be run on the computer without human intervention by an operator

ii. Explain how an operating system controls I/O devices. (2mks)
The operating system manages the use of input and output devices. This is done by the use buffers .The operating instructs input and output buffers to take inputs from an input device or to take outputs from the processor while the process using the input or output is suspended .when the process which needs the input is made active once again, the operating system will command the buffer to send data.

iii. Maintaining security is one of the functions the operating system. Explain how the operating system maintains security (2mks)
Maintaining security-in networks and larger computers each user is given a username or ID and passwords to gain access to the computer system. the operating system keeps a register of all the names so that the only persons with valid usernames or IDs passwords can access the system. The operating system keeps a log which records users logged in, the length of time each user stayed in the system and what they did.

(b) What does the following control measures against computer crime involve? (5 mks)
i. Audit trail
Careful study of an information system by experts to establish all weaknesses in the system that could lead to security threats
ii. Data encryption
Combination of letters and characters that deter unauthorized users of computers from accessing data
iii. Log files
These are special files that keep a record (log) of events on the use of computers and resources of an information system.
iv. Passwords

Is a combination of characters that prevents other users from opening and changing a document without permission?

v. Firewall

Monitor and control access to or from protected networks

(c) Briefly explain what happen during power on self test (POST) (3 mks)

- A line of text start scrolling up on the screen
- Check on the existence and conditions of the drives such as keyboard, monitor and mouse
- If a problem occurs due to malfunction, the process is halted and error message is displayed on the sreen

(d) Explain the functions of complementary metal-oxide semiconductor (CMOS) (2 mks)

- keep data that needs to be retained even when the computer is turned off and unplugged (a small battery is used to supply power to the CMOS chip)
- maintain system date, time among others

20. (a) i. List four stages in data collection (2mks)

- creation
- transmission
- preparation
- media conversion
- input validation
- sorting

ii. Describe two types of data processing methods. (2mks)

**Manual** – Use of a pen and a paper

**Mechanical** – Use of typewriter and calculators

**Electronic** – Use of computers

(b) What is meant by the following (2mks)

i. Reference file

Reference file – used for reference or lookup purposes that are required during processing

ii. Report

Report file – used to store permanent records extracted from the master file or generated after processing operation

(c) Explain the following file organization methods

i. Direct file organization (2 marks)

a record key is used to determine where a record is stored on the storage medial e.g magnetic and optical disk

ii. Index –sequential file organization (2 marks)

an index is used to enable the computer to locate individual records on the storage media e.g magnetic drum

(d) i. List down two examples of High level language (HLL) and state its most appropriate application. (2mks)

- **PORTRAN** – for scientific and mathematical programs
- **PASCAL** – Teaching structured programming
- **COBOL** – Developing business oriented programs
- **ADA** – Developing real time and industrial systems

ii. State two advantages of high level languages (1 mark)

- portable
- user friendly
- flexible
- east to debug

iii. State two disadvantages of high level languages (1 mark)

- have to be compiled to machine readable form before execution
- require large computer memory to run
- complexity of instructions which slow down program processing

e) Give **two** benefits of structural programming. (1 marks)

b) Easy to read
Easy to run and code
Easy to modify
Easy to test
Flexible