KENYA NATIONAL EXAMINATION COUNCIL
REVISION MOCK EXAMS 2016
TOP NATIONAL SCHOOLS

KENYA HIGH 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

KENYA HIGH SCHOOL KCSE TRIAL AND PRACTICE EXAM 2016

COMPUTER STUDIES

451/1 /PAPER 1

MARKING SCHEME

1. (a) What is an embedded computer?
   - It is a special purpose computer used inside a device
   -It is a dedicated computer that is attached to a machine to perform a specific task. (1x1)

   (b) The main component that formed the basis for second generation computers.
   Transistor (lx1)

2. (a) One function of a main frame operating system which you would not expect to find in theoperating system of a micro-computer.
   - It is a multi user operating system
   - it is multi access operating system - it allows a number of users to interact with the computer at the same time. Lx1

   (b) 4 examples of application software.
   - Word processor
   - Spread sheet
   - Data bases
   - Auto CAD
   - Ms -word
   - Ms -Excel
   - Ms —Access (Any4 ; ½ x 4 = 2mks)

3. 4 fields which would be expected in a database file of information about school students.
   - Name
   - Admn. No.
   - Class
   - House/dormitory,
   - Stream
   - Gender/sex (any 4; ½ x 4 = 2mks)

4. (a) 4 examples of document readers.
   - Optical Character recognition (OCR)
   - Optical Bar recognition (OBR)
   - Optical Mark recognition (OMR)
   - Magnetic Ink Character recognition (MICR)

   Magnetic Strip Reader or card reader (½ x 4 = 2mks)

   (b) One application for each of the input methods in (4.(a). (2mks)
   (i)-Reads text and images or objects
   (ii)-Read Bar codes on items
   (iii)-To mark questionnaires and multiple choice questions
   (iv)-To read and process cheque
   (v)-To read ATM cards (½ x 4 = 2mks)

5. Subtract 01011_2 from 11001_2 (2mks)
   Using ordinary method
   11001_2
   $\underline{-01011_2}$
   $2\ 01110_2$ (1x2)
   Using two's complement
   Flip _____ 01011_2 to

10100

Add l + 1

10101

Add 11001_2 to 10101_2

Therefore 11001_2

10101

(1) 01110

Discard $=01110_2$

Any method that gives the correct answer

6. Explain the following computer crimes, (2mks)
   (i). Fraud -use of computer to conceal information or cheating other people with the aim of gettingmoney. (1x1=1mk)
   (ii). Alteration.-changing the data or information without permission with an aim of miss informing others (1x1=1mk)
7. (a) Define:
   (i). Firewalls (lmk)
   - It is a program or hardware or a combination of both that filters the information coming through the internet into a computer.

   Or

   - It is a program that filters the information coming through the internet into a computer (Any lx1)

   (ii). Data encryption. (lmk)
   - It is the encoding of data during storage or transmission so that it cannot be understood by those who do not have encryption key.
   - The word scrambling can be used in place of encoding or
   - Software or device that filters data between different networks by enforcing the host network access control policy.
8. Identify three advantages of using modular programming in system development. (3 marks)
   - To enable program be developed in stages — hence the programmer can concentrate on one task at a time
   - It allows a large program to be written by several people hence saves time (any 3x1=3mks)
   - A single module can be used by different programs rather than creating same module in different programs.
   - Modules can be tested individually hence easier to debug as they are short errors can be traced easily
   - Program modification is easier since changes can be isolated within specific modules.

9. Explain the following terms as used in computing cycle. (3 marks)
   (i) Fetch phase- The stage in which the instruction is read from the memory or an input device via data bus into the instruction register
   (ii) Decode phase- Stage in which the processor determines the kind of operation it is required to perform.
   (iii) Execution phase- In this stage the control unit issues appropriate sequence of signals depending on the decoded information
10. (a) Differentiate between Cache and Buffer memories. (2mks)

    Buffer — control the speed difference between communicating device or Control the speed imbalance between two devices

    Cache — it boost CPU processing speed because the CPU can access it much more quickly than RAM

    (b) List and give the functions of computer buses. (3mks)
    - data bus

- control bus
- -address bus
- Functions
- data bus — carries data to and from the CPU
- Pathway where the actual data transfer takes place
- Address bus — used to locate the storage position in memory where the next instruction or data to be processed is held.
- Control bus — it is the pathway for all timing and controlling functions sent by the control unit to other parts of the system.

ll. (a) Explain any two factors that should be considered during output design (2marks)
- The target audience or type of recipients
- the frequency of report generation
- Quality and format required

(b) Why is observation sometimes disadvantageous when used in fact finding? (1 mark)
- Like likelihood of change of work performance in the people under study
- Faced by time limitation
- Limited by distance
- Standards or quality may change due to break down of machines and one may get wrong information.

12. Outline two major functions of UPS in computer laboratory. (2 marks)
(i) It regulates power voltages by eliminating surges and brownouts
(ii) It temporarily provides power to the computer incase of a sudden power failure so the user can save his
work and shut down the computer

13. (a) State the use of:
(i) Light pen (lmk)
- It is used to make selections in CAD
- It is also used to draw objects from shapes that appear as icons on screen

(ii) Graphics tablet. (lmk)
- They are used to trace or draw highly detailed engineering and architectural drawings and designs.

(b) Name any advantage of solid-state memories over other storage media. (1 mark)
- Does not require a drive to read or write to them
- light and

14. Outline four data types that can be entered into a spreadsheet. (2 marks)
- Value- numeric and date data types
- labels — alphanumeric or text
- Formulars — user define mathematic expression
- Functions — in built mathematic arguments that compost of text, operators and ranges.

15. (a) Define virtual reality. (1 mark)
- It is the use of computer to visualize, manipulate and interact with complex data. ORX-refers to a condition in which a person becomes psychologically immersed in an artificial environment using computers

(b) List any two applications of virtual reality. (1 mark)
- Video mapping
- Immensive systems
- Telepresence

16. (a) List two examples of;
(i) Third generation languages.
-Pascal -BASIC

- FORTRAN - COBOL

(ii) Object oriented languages.

- simula -Java
- small Talk -C++

(b) Define

(i) Object code

-it is a machine code produced by a computer
-it is an output of a translator
-it is a translated source code
- translated program code

(ii) Source code

-this is a program written in the specific programming language
- un translated program code
- program in human understandable

(c) Differentiate between a compiler and an interpreter.

Compiler	Interpreter
-Fast in translation	Relatively slow translate line by line
-Translate whole program at once	translate line by line Take less memory
-Take up large memory space	Take less memory Every time program is run hence
-saves time because Exe file is saved	Every time program is run hence consume time

(d)

```
START
PRINT ENTER CAR NUMBER
PRINT ENTER NUMBER OF DAYS
IFNUMBEROFDAYS>=7THEN
(NUMBER OF DAYS X 2500) - (NUMBER OF DAYS X2500) 25%
        ELSE
NUMBER OF DAYS X 2500
END IF
END
```

17. (a) State any three duties of the following ICT personnels.

(i) Systems analyst.

- Hold discussions with manager and users of the system to determine their exact needs
- Gather facts about the system in question
- Make recommendations for the procurement of hardware and software if necessary
- Test and debug the new system
- Assist in training employees to use the new system
- Evaluate the performance of the system
- Design new system (any 3 x1=3mks)

(ii) Database administrator. (3 marks)

- Ensure the data base performance is optimum
- Develop policies and procedure to ensure the security and integrity of the system
- Co-ordinates data collection and storage
- Meet with users to make modifications to the database
- Co-Ordinate the database design
- Select database system for the company
- Maintains the database system (any 1x3=3mks)

(iii) Web master (3 marks)
- Ensure the site contains the required information
- Ensure that all the links on the site work and site is easy to navigate(any 3x1=3mks)
- Develop a web page
- Post new content to the website / update the web site content

(b) Name any three ICT courses offered in the Kenyan universities. (3 marks)
- Computer science
- Information technology IT
- Computer engineering
- Software engineering (any 1x3=3mks)

(c) Outline three advantages of telecommuting. (3 marks)
- Cuts traveling cost
- It saves time because no traveling involved
- Productivity increases
- Less distraction from co-workers
- No need to hire large office hence low rent (any 1x3=3mks)

18. (a) Define artificial Intelligence. (1 mark)
- Refers to the ability of a computer to mimic capabilities
- It is the branch of computer science that is concerned with the development of machines that emulate human — like qualities such as leaning, reasoning, communicating
- The science of attempting to develop machine that mimic human behaviours

(b) Explain the application of artificial intelligence in the following areas. (6 marks)
(i) Natural language processing - have been used to produce voice recognition and synthesis system
(ii) Robotics - All have been used to control robot
- AT have been used to construct robots
- Computers are used to control machines in the place of man. E.g. welding, spraying, loading

(iii) Expert systems - At have been used to produce
- Expert systems that can be used in research, medical diagnosis etc

(b) Give any three symptoms of the following computer work-related disorders and two of their methods of prevention.
(i) Computer vision syndrome. (4 marks)
Symptoms
- Sore, tired, burning and itching or dry eyes
- Blurred or double vision
- Headache or sore neck
- increased sensitivity to light

<u>Prevention</u>
- Take a break of 5 to 10 minutes
- Reduce glare and reflection from the computer screen
- Adjust the contrast and brightness of the screen
- Prevent eye strain by adjusting the sitting height
- Gentle massage your eyes

(ii) Repetitive strain injury. (4 marks)
Symptoms
- Numbness in the thumb or in fingers
- Extreme pain at the wrist
- Tingling in the finger

Prevention
- Take frequent breaks
- Position as the keyboard

19. (a) Define the term ergonomics (1 mark)
-it is a science that determines the best working condition for humans who work with machines

(b)(i) Give any three advantages of using a fibre optic cable in data transmission (3 mks)

- Cannot be affected by electromagnetic interference
- Offers fast transmission rates than other media
- Supports high bandwidth or can transmit large volume of data at once
- Less prone to transmission impairments or has low attention
- Eaves dropping is difficult to be done
- Takes limited or less space

(ii) Name two types of fibre optic. (1 mark)

- Single mode
- Multi mode

(c) State three advantages of wireless communication. (3 marks)

- Flexible in operation — one move around without losing access to the network
- Covers a large geographical area easily
- Covers remote areas where physical infrastructure like cables is expensive

(d) Explain the following terms. (3 marks)

(i) Multiplexing - it is the process of sending multiple data signals over the same medium lx1 (Give mark if diagram exist)

(ii) Bandwidth - it is the maximum amount of data that a transmission medium can carry at any one time (1x1)

(iii) Base band signal- it is a digital signal that is generated and applied to the transmissio medium directly without modulation.

(e) Explain the use of these communication devices. (4 marks)

(i) Routers- It interconnect different network. It directs data efficiently towards its intended destination across a network

(ii) Hub - is a component or device in a network that transmit signals by broadcasting the all the computers on the network. The computer whose address is on the message picks the message from the network that is part of the broadcast domain.

20. (a) Define Internet. (1mark)

- It is a network of networks that connects computers worldwide via a huge set of telecommunication links.

(b) Describe the transmission of data over a telephone line (4 marks) (diagram)

(c) Outline the 'line of sight' principle in wireless transmission. (2marks)

- It is the <u>signal pathway</u> between <u>two receiver stations</u>. There must be <u>no obstacle</u> between the two stations or along the line of sight for this will <u>block the signal.</u>

(d) The first column in the table below contains the formulae stored in cell F10 of a spreadsheet. Enter the formula as they would appear when copied to cell M20 of the same spreadsheet. (3marks)

Formula in F10	Formula in M20
= D10*E10	= K20*L20
=A$25	= 1& 25
= 4*D$13	= 4*K&13

(e) (i) Differentiate between multiprogramming and multiprocessing. (2marks)

- Multiprogramming: The ability of the computer to run more than one program apparently at the same time.
- Multiprocessing: Ability of the computer to run two processors at the same time

(ii) Give application areas of the following data processing modes. (3 marks)

(a) Batch

- Processing fairly bills e.g. electricity, water,
- Payroll processing

(b) Real time

- Manufacturing, interactive games
- Robot control systems, airline booking

(c) On line

- Airline booking/reservations
- Manufacturing

- E-learning
- E-commerce
- instant messaging