INFORMATION AND COMMUNICATION TECHNOLOGY (ELECTIVE) 2

1. GENERAL COMMENTS

This paper happened to be the third May/June ICT (Elective) paper 2 administered. The standard of the paper compared favourably with the previous papers in the areas of content and level of difficulty.

The paper was well within reach of the candidates and the general performance was not much different from that of the first two.

On the whole, the performance was just average.

2. A SUMMARY OF CANDIDATES' STRENGTHS

(1) In general, candidates responded to the questions as demanded by the rubrics.

(2) A few candidates exhibited good knowledge of the subject matter.

(3) A greater number of candidates expressed themselves much better in the English Language than exhibited before.

3. A SUMMARY OF CANDIDATES' WEAKNESSES

The following were the main candidates' weaknesses identified:

(1) Inability to appreciate the key requirements of the questions.

(2) Apparent inadequate preparations.

(3) Little or no evidence that candidates planned answers before writing them down.

(4) Poor communication skills.

(5) Some of the candidates had bad handwriting.

(6) Some candidates demonstrated in their answers that they had little or no knowledge of the examination syllabus.

4. SUGGESTED REMEDIES

(1) Candidates should carefully read through the questions, selecting those to be attempted and planning the answers before writing them out.

(2) Candidates should learn with suitable textbooks and material on ICT and carefully use the Internet as a learning tool.

(3) Candidates should avoid the use of inappropriate standards of communication such as those on the various social media platforms.

(4) Candidates should allow for time to read through their answers to correct any errors as well as add further details.

(5) Teachers of the ICT Elective subject should learn to adhere to the syllabus as much as possible.

5. DETAILED COMMENTS (QUESTION BY QUESTION)

Question 1

(a) What is *e-learning?*
(b) State five advantages of e-learning.
(c) Outline three constraints in using multimedia for teaching.

Majority of the candidates answered the (a) and (b) parts fairly well but (c) was poorly tackled by almost all the candidates. The following is the solution:

(a) E-learning is the use of electronic educational technology in teaching and
L earning.

(b) **Advantages of e-learning**:
- (i) Facilitates distance education.
- (ii) Reduces travel time and cost.
- (iii) Teaching and learning can be extended to a larger audience.
- (iv) Classwork can be scheduled around work and family.
- (v) Teaching and learning can take place at any location.
- (vi) Students can work at their own pace.
- (vii) Easy communication between students and teachers and vice versa.

(c) Constraints in using multimedia:
(i) Absence of electrical power supply.
(ii) Non-acceptance of digital culture.
(iii) Lack of user's familiarity with equipment.

(iv) Resistance to change.
(v) Non-availability of digital equipment.
(vi) Lack of appropriate skills of both teachers and students.
(viii) Lack of time required to plan, design, develop and evaluate multimedia activities.

Question 2

State five features of:

(a) an electronic spreadsheet application;
(b) a QBASIC programming language.

Almost all the candidates who attempted this question got the requirements entirely wrong. They approached both parts of the question in terms of what is seen on the computer screen when a spreadsheet program is launched and the essentials of QBASIC.

The required solution follows:

(a) Features of an electronic spreadsheet application:

(i) Supports the idea of variables.
(ii) Use of formulae.
(iii) Use of functions.
(iv) Supports 'what if?' analysis.
(v) Provides a wide range of graphs.
(vi) Dynamic calculations.

(b) Features of a QBASIC programming language:

(i) Simple and easy to learn.
(ii) Automatically checks syntax.
(iii) Automatically capitalizes the reserved words.
(iv) Allows users to break lengthy programs into modules.
(v) Has dynamic program debugging feature.
(vi) Supports local and global variables.
(vii) Interprets a statement at a time to the CPU.
(viii) Contains two windows – program window and immediate window.
(ix) Can run nearly under all DOS and Windows operating systems.

Question 3

(a) A Ghanaian company operating in Nigeria has its files on a storage system in Abuja. The company's backup files are kept on another storage system in Accra.
(i) State the two storage systems involved.
(ii) Give one reason for these different storage locations.

(b) (i) List three components of the central processing unit.
(ii) State a function each of the three components listed in 3(b)(i).

Most of the candidates, for (a), referred to Primary and Secondary storage – complete deviations.

The suggested solution is as follows:

(a) (i) - Main Server/Database Server/File Server.
- Backup Server/Database Server/File Server.

(iii) The company keeps its backup in Accra so that it can easily recover/restore lost or damaged documents in case of any disaster in Abuja.

(b) (i) **Components of the Central Processing Unit:**
- Arithmetic Logic Unit
- Register
- Control Unit
- Memory Unit

(ii) **Function of component:**
- *Arithmetic Logic Unit:*
  - Carries out the arithmetic e.g. Add, Subtract, Multiply and Divide.
  - Performs certain logical operations e.g. Testing whether two data items match.

- *Register:*
  - Data and instructions pass in and out of the processor through the memory data register (MDR).
  - All data and instructions pass in and out of main storage through the memory buffer register (MBR).
  - I/O devices connected to the processor via a bus also have a data buffer register which serves a similar purpose as the MBR.

- *Control Unit:*
  - The nerve centre of the computer.
  - Co-ordinates and controls all hardware operations.
  - Deals with each instruction in turn in a two-stage operation called the fetch-execute cycle.

- *Memory Unit:*
  - Memory buffer that temporarily stores data the processor needs, allowing the processor to retrieve the data faster than if it came from main memory.
  - Holds random data, usually on first in first out, or first in last out basis.

Question 4

State five roles of information in the society.

A good number of the candidates were preoccupied with the attributes of useful information, viz. accuracy, timeliness, etc., an indication that they did not pay attention to the requirements of the question.

The recommended solution is:

The roles of information in the society include:

1. **Keeping people informed on current issues.**

   People, both in and outside the corporate institution, require information for them to be abreast with current events that may directly or indirectly impact on what they engage in.

2. **Proving facts for decision making.**

   Individuals, especially managers, depend on some amount of information to enable them make the decisions required of them. Information, it is said, is the trigger for the decision making process.

3. **Making facts available for a firm to compete effectively in its industry.**

   The management of an organization need information on other firms within its industry in order to craft strategies for effective competition.

4. **Facilitating plans for development.**

   The government needs information to enable it come up with plans for infrastructural and other development projects.

5. **Enabling business decisions on what will make organisations more successful.**

   Information on demand and supply, for example, will make it possible for the management of organisations to decide on production and sales that will make for optimum success.

6. **Keeping the security agencies informed on relevant issues.**

   The security agencies require information that will help in their work of protecting the state and individuals Such information may come from in or outside the country..

Question 5

Explain the following database terms:

(a) Field;
(b) Query;
(c) Record;
(d) Design View
(e) Datasheet View.

This was the question that attracted the worst of answers. The general knowledge on database terminologies was extremely poor.

The suggested solution is as follows:

(a) **Field:** An element or column in a database table/file that contains a specific item or information.

(b) **Query:** A question/request about the data stored in a database.

(c) **Record:** An element or row in a database/file that contains a collection of data about an item.

(d) **Design View:** A database window in which tables are designed for a database.

(e) **Datasheet View:** A database window that displays data from a table, form, report or query for changes (e.g. editing, viewing, addition, deletion and searching) to be effected.

INFORMATION AND COMMUNICATION TECHNOLOGY (ELECTIVE) 3

1. GENERAL COMMENTS

The standard of the paper and that of the previous years' examination is the same. It was noted that, candidates' performance was better than the previous year.

It has, however, been observed that performances continued to be localized even though the level has reduced, i.e. excellent performances are concentrated at certain schools while bad performances are also concentrated at certain schools. The variance of performances at localities is insignificant.

This year has continued to see candidates scoring high marks in the HTML and Database. The Excel question was poorly attacked. Candidates had problems with the tax computation and the cell protection.

2. A SUMMARY OF CANDIDATES' STRENGTHS

(1) Candidates were able to enter data.
(2) Candidates were able to code HTML.

3. A SUMMARY OF CANDIDATES' WEAKNESSES

(1) An insignificant few number of candidates used Microsoft Excel for the database application.
(2) Some candidates did not name objects properly.
(3) Usage of the header facility in the table was not good.
(4) Many candidates were unable to create the database relationships.
(5) Candidates had difficulty in protecting excel cells.
(6) Candidates could not correctly calculate tax.
(7) HTML files were saved as ".txt" files.

4. SUGGESTED REMEDIES

(1) Teachers must cultivate logical reasoning skill in candidates to help in the development of programming skills.
(2) Teachers must pay attention to the curriculum .They must stress on technical approach in teaching ICT.
(3) Candidates must be encouraged and assisted to pick up personal ICT projects structured in a manner which will compel them to eventually be practical in their approach to the subject and cover significant aspects of the subject.

5. DETAILED COMMENTS (QUESTION BY QUESTION)

Question 1

HTML

The question required candidates to create an html web page. It required the use of a *Text Editor.*

The solution to the question is expected to follow the pattern explained below.

HTML is a standard and the layout follows a specific structure to allow for correct interpretation for presentation. The structure of an html document is as follows:

```
<!DOCTYPE html>
<html>
<head>
<title>Title of the document</title>
</head>

<body>
The content of the document.....
</body>

</html>
```

It must be noted that the title is part of the head tag. Placing it outside the head is not a correct structuring even though you can have the title correctly displayed.

The body tag is not part of head tag as some have sort to do.
Even though an example of indentation has been given in the question, candidates still fail to indent properly.

Indentation is not considered critical for the structure tags i.e. html, head, title, and body, but the lines coded between the opening and closing sets of any of the tags are critical.

NOTE: … is the tag for Ordered HTML Lists. … is the tag for listing the items one by one. Note that the <ol> and tags are aligned vertically while <li> and tags are also aligned vertically but pushed inside the <ol>.. tag. i.e. indented.

The arrangement

```
<p>
<u>Items</u>
</p>
```

has been given in the question as *an example,* yet, candidates did not perform indentation. …. is a set of paragraph tags. Within this paragraph a content of the paragraph is entered as *Items.* This content is underlined using the <u>….</u> set of tags.

At the completion of the work candidates work will look similar to the codes below:

```
<!DOCTYPE html>
<html>
<head>
<title>
        Candidates' name and Index Number goes here
</title>
</head>

<body>
        <p>
                My top THREE subjects are:
        </p>

<!--    List  the items using Ordered HTML Lists as implied in the line
above. -->

        <ol>
                <li> Mathematics </li>
                <li> English Language </li>
                <li> Life Skills</li>
        </ol>

</body>

</html>
```

Some candidates used wrong tags such as

```
<li1> Mathematics</li1>
<li2>English Language</li2>
<li3>Life Skills</li3>
</html>
<UI> MATHEMATICS</U1>
<U2> ENGLISH </U2>
```

Some HTML files were coded correctly but saved as text files. The editor used seems to have had a default ".txt" extension. It added it to the ORDERED_LIST.HTML typed by the candidate.

With the use of unclosed title tag and nobody tag some candidates had all their content shown in the title during display.

Question 2

EXCEL

Candidates were not able to carry out this work except for an exceptional few.

a. Some created the tables in Access.

b. This question requires candidates to formal the cells under Monthly_Salary, Tax and Net_Salary columns to have the 1000 separator(,), two decimal places and the Ghana Cedi symbol (GH₵).

c. Tax calculation is not done by just picking the gross and looking at the range it fits in for the percentage to be applied. The application of tax rates is done by splitting the salary into the five tax ranges and applying the appropriate tax rate and finally summing up the taxes to arrive at the final tax.

   Candiates may also use cell functions to introduce a comditional computation of the taxes.This requires programming skills.

d. For the calculation of Net_Salary, the formula was given as:

   Net_Salary = Monthly_Salary – Tax

e. For the cell protection, any entry in any column apart from the Monthly_Salary column will provide an error message on-screen. The following steps can be followed to effect this protection:

   (1) Select cells to be unlocked after protection
   (2) Unlock these cells
   (3) Remove the check against "Lock"
   (4) Protect the worksheet

Question 3

DATABASE

a. The requirement is to use a database application to create a database of student data and name it TERM in the folder created.

   The exact naming of the database is critical. Its placement in the folder created is critical. You can manually search for a document on the computer through various techniques even if you forgot the name. However, during the execution of a program, the name and its location must be ***exact*** otherwise the program cannot find it.

Some candidates used Microsoft Excel to answer this question which was wrong.

b. Three tables were required to be created defining the fields appropriately:- STUDENTDETAILS, SUBJECT, and SUBJECTSELECTION.

   Defining the fields appropriately implies that the field names must be correct and their data types must be correct. A table with wrong field data types is not a correct table.

   Some candidates did not name the tables properly. Others defined all fields as type *Text.* This is not correct in some instances.

c. Appropriate keys are to be used in the created tables to create the relationships among the three tables.

   To finally link the relationships, select the primary key from STUDENTDETAIL table and dragg it to the same field in the SUBJECTSELECTION table.

   Repeat the steps and create the relationship betwen the primary key in the SUBJECT table and the SUBJECTSELECTION table. The result is as follows:

d. Calculations of BMI is to be saved as QRYBMI.The formula for the calculation was given as :

$$BMI = \frac{WEIGHT}{HEIGHT \times HEIGHT}$$

   The query in sql view is as follows:

```
SELECT STUDENTDETIAL.[INDEX _NO], STUDENTDETIAL.[STUDENT
_NAME], STUDENTDETIAL.[DAT-OF _BIRTH], STUDENTDETIAL.HEIGHT,
STUDENTDETIAL.WEIGHT, ([WEIGHT]/([HEIGHT]*[HEIGHT])) AS QRYBMI
FROM STUDENTDETIAL;
```

   Some candidtes missed the use of the brackets in code expression of the formula for the computation of the BMI.