

## 25.0 COMPUTER STUDIES (451)

From the inception of revised secondary curriculum in the year 2002, the subject Computer Studies has been examined five times in the years 2006, 2007, 2008, 2009 and 2010 respectively.

The subject is examined in three papers:

- Computer *Studies paper one* coded 451/1, a theory paper which covers the entire syllabus;
- Computer *Studies paper two* coded 451/2, a practical paper which examines the application packages in the syllabus.
- Computer *Studies paper 3*, coded 451/3 which is a trade project.

### 26.1 CANDIDATES' GENERAL PERFORMANCE

The table below shows performance in Computer Studies in the years 2007, 2008, 2009 and 2010.

**Table 31: Candidates' Overall Performance in Computer Studies for the last three years.**

Year	Paper	Candidature	Maximum Score	Mean Score	Standard Deviation
2007	451/1		100	45.89	18.3
	451/2&3		100	63.62	15.44
	<b>Overall</b>	<b>4,732</b>	<b>200</b>	<b>109.54</b>	<b>30.00</b>
2008	451/1		100	38.78	15.64
	451/2&3		100	53.13	15.74
	<b>Overall</b>	<b>5,498</b>	<b>200</b>	<b>91.66</b>	<b>29.46</b>
2009	451/1		100	45.41	16.48
	451/2&3		100	50.93	16.39
	<b>Overall</b>	<b>6,115</b>	<b>200</b>	<b>96.34</b>	<b>30.32</b>
2010	451/1		100	51.98	17.38
	451/2&3		100	59.83	16.86
	<b>Overall</b>	<b>7,045</b>	<b>200</b>	<b>111.81</b>	<b>32.30</b>

The following are the observations:

- 25.1.1 There is a dramatic increase in candidature in the subject from 4,732 in the year 2007 to 7,045 in year 2010. This representing 48.9% and 15.2% from 2009 to 2010
- 25.1.2 Overall performance in the subject increased from a mean of 96.34 in the year 2009 to 96.34 in the year 2010.
- 25.1.3 Performance in paper 1 (451/1) increased from a mean of 45.41 in the year 2009 to a mean of 51.98 in the year 2010, representing a 14.47% increase.
- 25.1.4 Performance in both the practical paper (451/2) increased from a mean of 50.93 in the year 2009 to a mean of 59.83 in the year 2010, representing a 17.47% increase.

Questions which were poorly performed in the 2010 examinations are briefly discussed below.

### 25.2 PAPER 1 (451/1)

#### Question 1

List four activities carried out by a data processing system.

#### Weaknesses

Students were listing the stages of data processing cycle

#### Expected Response

- Input

- Process
- Control
- Storage
- Output

**Advice to Teachers**

Teachers should emphasise the distinction between the activities in SDLC and the data processing stages

**Question 3**

Explain why an intranet is a more secure way to share files within an organisation compared to the internet.

**Expected Response**

Intranet is a company's internal network to which outsiders cannot get access to while Internet allows outsiders to access company network if proper security measures are not implemented.

**Weakness**

Some candidates could not relate intranet security in terms of number of users

**Question 7**

Study the pseudo code below and determine its output.

- (a) T = 0  
(b) M 0  
(c) K 1
- (a) M = M + T  
(b) T = T + 5  
(c) K = K+1
- Repeat step 2 while K < 3
- Write M, T
- Exit

**Expected Response**

Learners were expected to generate the following list of output

T	M	K
0	0	1
5	0	2
10	5	3

**Weakness**

Candidates showed inability to execute the number of times the pseudo code loop executes and therefore producing wrong output.

**Question 11**

Copyright laws are laws granting authors the exclusive privilege to produce, distribute, perform or display their creative works. It is a legal framework for protecting the works such as book publishing, motion-picture production and recording.

State two challenges that are posed to these laws by ICT.

**Expected Response**

- Easy of communication.
- Easy of duplication
- Enforcing is still a problem e.g. officers are not computer literate.
- Lack of capacity for people enforcing the law

### Weakness

The question was poorly attempted. Majority of the candidates were unable to give challenges posed to copyright laws by ICT

### Advice to the teacher

The teachers are expected to make emphasize on this area. There are many imported reference materials which exhaustively cover this topical area.

### Question 16

- (a) Machine language programs are more difficult to write than high-level language programs. State **two** reasons for this.
- (b) In order to process examination results of students in a school, their names, index numbers and scores in 11 subjects are required. The average score for each student is then determined and a grade assigned. This process is repeated for all 40 students in a class.

Draw a flowchart to:

Read a student's name, index number and the scores in all the subjects.

Determine the student's average score.

- Assign a grade to the student depending on the average score as follows:

<u>Score</u>	<u>Grade</u>
80 < score	A
60 < score < 80	B
40 < score < 60	C
score < 40	F

Display the student's name, index number, average score and the grade.

- Repeat the above steps for all the students in the class.

- (c) Below is a list of program segments in different generations of programming languages.

Identify the language for each.

- (i) LDA 105 SUB 40 ADD 20  
(ii) 10000110 10111101 01111000 0001100  
(iii) For x: = 1 to 10 do Write (x);

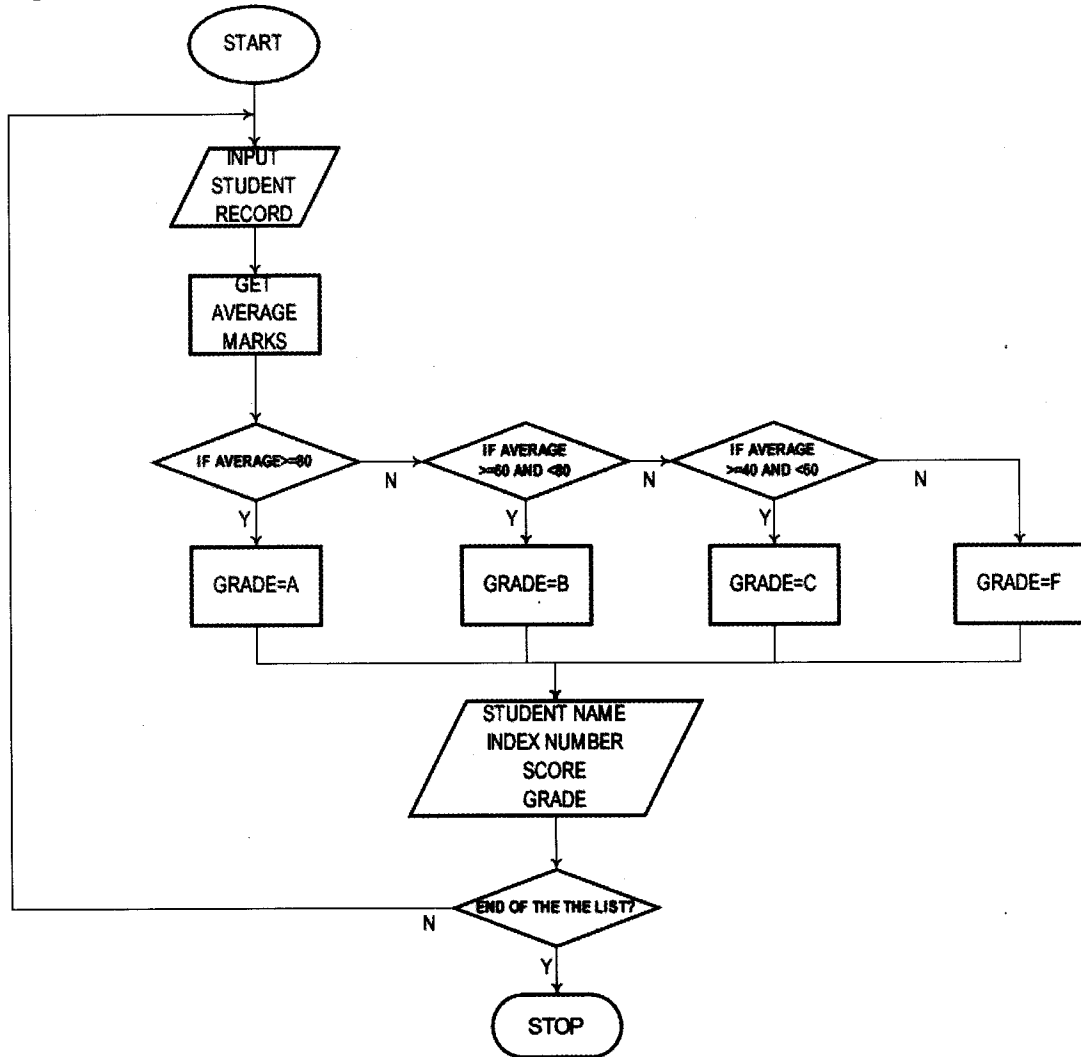
### Expected response

- (a)
- It is time consuming to develop.  
It is easy to make mistakes because only 0's and 1's are used.
  - Program written for one computer model may not run on another computer model.

**Expected response**

(b)

Expected flow chart is as shown



**Expected response**

(c)

Generation of programming languages:

- (i) Second generation
- (ii) First generation
- (iii) Third generation

**Weakness**

Most students were unable to use appropriate flow charting tools. They were also unable to conceptualise the looping structure in the narrative.

**Advice to the teacher**

Flow charting concept should be emphasised when teaching by using real life problems. Learners to be exposed to more exercises on the same.

**Question 20**

- (a) Using ones complement, convert the decimal number -9 into a 6-bit binary number.
- (b) (i) State three standard coding schemes used in data representation.

(ii) In a certain coding scheme, each character occupies 7 bits. Letters of the alphabet are assigned consecutive codes. If letter N is represented by 1010010; what is the representation of letter A in this coding scheme?

(c) Using twos complement, show how the arithmetic below would be carried out on a 8-bit computer system.  
 (+54)-(+29)

**Expected response**

(a)

$$9_{10} = 1001_2$$

$$= 001001 \text{ in six bits}$$

$$-9_{10} = 110110$$

(b) (i) ASCII, BCD, EBCDIC, Extended ASCII

$$A: 1010010_2 = 82_{10}$$

$$\text{DECIMAL CODE} = 82 - 14$$

$$= 69$$

$$= 1000101_2$$

B: ASCII

$$C: 54 = 110110_2$$

$$29 = 11101_2$$

$$\text{COMP}(29) = 00011101_2$$

$$= 11100010_2$$

$$+ 1_2$$

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$$11100011_2$$

$$\text{ADD} = 00110110$$

$$11100011$$

$$100011001$$

$$0011001_2 = 25_{10}$$

**Weakness**

The candidates had difficulty in representing letters character in its equivalent binary notation implying that they had no idea on how characters are represented using the **four** coding schemes as required in the syllabus namely; ASCII, BCD, EBCDIC, Extended ASCII

### 25.3 PAPER 2 (451/2)

#### Question 1

Mr Kiprof Onyango owns houses for rent. Table 1 below is a record of his tenants' rent payments.

Tenant ID	Tenant Name	House Number	Month	Amount (Ksh)
2019	Akinyi	A1	January	3,000
2022	Maloi	A2	January	4,000
2038	Nduta	B1	January	4,500
2059	Rop	B2	January	4,500
2070	Mutua	CI	January	4,000
2090	Akinyi	A1	February	3,000
3030	Maloi	A2	February	4,000
3040	Nduta	B1	February	4,500
3025	Mutua	CI	February	4,000
3050	Kagu	C2	February	3,500
3055	Maloi	A2	March	4,000
3090	Kagu	C2	March	3,500

Table 1

- Create a database file that can be used to store the above data. Name the file 'Rent'.
- Create two tables, one to store tenant details and another to store tenant rent payments. Name the tables 'Tenants' and 'Payments' respectively.
- Create a relationship between the two tables.
- Design a form to be used to enter data into each of the two tables
- Enter the information given into the two tables.
- Create a report showing the amount Mr. Onyango received from each tenant, the total for each month and the total amount he received over the three months. The report should be titled 'Rent Income'. Save the report as 'Income'.
- Create a query named 'Statement' to extract Maloi's records of rent payment.
  - Create a report named 'Tenant Statement' showing Maloi's rent payment history. The report should be titled 'Tenant Statement'.
- Print the two tables and the two reports.

#### Expected response

- Creating a database  
Correct database name
- Creation of the two tables  
Each table ½ mark  
Primary key (1 table)
  - Fields (first table)
    - 3 fields
  - Fields for the 2nd table
- Relationship
  - Correct relationship
  - Choosing correct table
  - Enforcing the relationship
- Creating the two forms
  - Existence of fields
  - Providing name to each form
- Each tenant record (Form) ½ x 6 records  
Each payment record (Form) ½ x 12 records

- (f) Presence of report  
Appearance correct (fields)
- Name
  - Month
  - Amount
- Use of functions
- Sum January, February, March
  - Grand total
- Report naming and saving  
Title name
- (g) (i) Presence of correct query  
Presence of fields (Name, Amount, Month) in the query Correct criteria  
Saving query
- (ii) Report  
Data source (query) Name of report (saving) Title of report
- (h) Printing: Candidates expected to print:
- 2 tables
  - 2 reports

#### **Weaknesses**

- Candidates were not keen to name the database using the name provided, they use default names as supplied by the application.
- Some candidates were unable to split the table provided into two distinct entities, showing clearly that they lacked the basic knowledge of normalisation.
- Some candidates created forms that were not related to the table structure
- There were cases of wrong data entry, indicated that learners were not keen on their work or they lacked basic keyboard skills.
- Creating report with summaries proved to be an uphill task for some many candidates indicating that they lacked the basic concepts on the creation of summaries using the inbuilt functions as provided for by the application.
- Some learners were unable to produce the required hard copies of their work, indicating that they lacked concepts of printing.

#### **Advice to Teachers**

- The teachers should introduce basic concepts of normalisation up to the First Normal Form (1NF) without taking the candidates through the complexities of normalisation. The learners should be able to appreciate the need to have tables split.
- Schools should ensure that learners are exposed to hardcopy output devices, which include printers and their accompanying accessories so that learners can perform some of the required task with speed and accuracy.