

## 24.0 COMPUTER STUDIES (451)

This was the third time the subject was tested under the revised syllabus. The subject is tested using one theory paper, a practical and a project paper.

### 24.1 CANDIDATES' GENERAL PERFORMANCE

The table below shows performance in Computer Studies in the years 2006, 2007 and 2008.

*Table 29: Candidates' Overall Performance in Computer Studies for the last three years.*

Year	Paper	Candidature	Maximum Score	Mean Score	Standard Deviation
2006	451/1		100	51.51	18.22
	451/2&3		100	57.57	16.77
	<b>Overall</b>	<b>4,181</b>	<b>200</b>	<b>109.08</b>	<b>32.00</b>
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>

From the table above, it is to be observed that:

- 24.1.1 Candidature in the subject increased from **4,732** in the year 2007 to **5,498** in the year 2008 representing a **16.2%** increment.
- 24.1.2 Performance in *paper 1 (451/1)* declined significantly from a mean of **45.89** in the year 2007 to a mean of **38.78** in the year 2008, representing a **7.11%** decline.
- 24.1.3 Performance in both the *practical paper (451/2)* and the *project paper (451/3)* declined from a mean of **63.62** in the year 2007 to **53.13** in the year 2008.
- 24.1.4 Overall performance in the subject declined from a mean of **109.54** in the year 2007 to **91.66** in the year 2008.

Questions which were poorly performed are briefly discussed below.

### 24.2 PAPER 1 (451/1)

#### Question 8 (b)

Describe each of the following types of computers:

- (b) embedded.

The candidates were expected to describe an embedded computer.

#### Weaknesses

Some candidates did not answer this question correctly. This could have been caused by lack of familiarity or poor instruction by the teacher on types of computers or classification of computers.

#### Expected Response

It is a computer that is within other device such as lifts, petrol pumps, etc.

**Advice to Teachers**

Teachers should teach various classifications of computers including emerging ones.

**Question 10 (a)**

List **four** stages in data collection.

The question required candidates to list four stages in data collection.

**Weaknesses**

The question was easy but some candidates were not able to list the four stages, possibly because they had not been taught.

**Expected Responses**

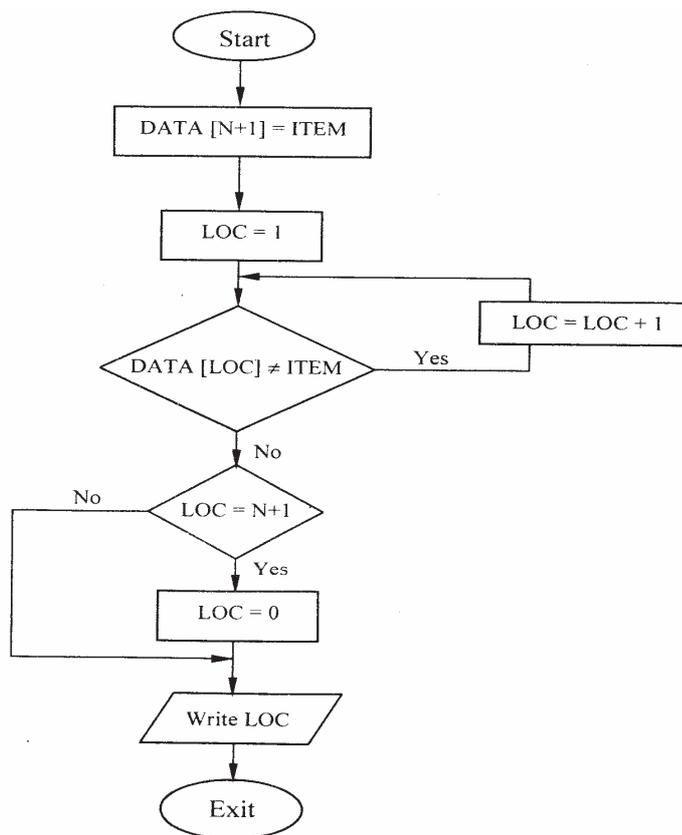
- Data creation.
- Data preparation.
- Conversion.
- Validation.
- Sorting.
- Control.

**Advice to Teachers**

It is advisable that the stages are listed in their logical sequence to show better understanding of the stages.

**Question 16 (a)**

Study the flow chart below and answer the questions that follow.



If DATA is the following sorted list of 13 elements, such that  $N = 13$ :  
 (where  $N$  is the number of elements in the list), 11, 22, 30, 33, 40, 44, 55, 60, 66, 77, 80, 88, 99.

(a) Determine the output from the flowchart if ITEM is:

- (i) 40
- (ii) 99
- (iii) 120
- (iv) 5

This question required candidates to analyse the flowchart and predict the output if the flowchart is fed with the given data.

**Weaknesses**

Most candidates did not dry run the flowchart correctly and hence failed to obtain the required output.

**Expected Responses**

The most appropriate way of approaching this type of question is to list each item that is computed and then go through every step in the flowchart for instance;

When  $ITEM = 40$ ,  $N = 13$  and the elements of the list are given, one can come up with a table as shown below

**Step 1**  
 Data  $[N+1]$  i.e. DATA  $[13+1]$   
 = 40

**Step 2**

Item	Loc
40	1
	2
	3
	4
	5

**Step 3**

Compare Data [Loc] with item in this case Data[1] = 11

Since they are not equal increment Loc by 1. Continue with the process until Loc = 5 where you exit the loop.

**Step 4**

The decision box is comparing Loc = 5 with 14 and since they are not equal you follow the No path write Loc as 5 and exit.

- (i) = 5
- (ii) = 13
- (iii) = 0
- (iv) = 0

**Question 16 (b)**

Explain the purpose of this flowchart.

This question required the candidates to explain the purpose of the flowchart.

**Weaknesses**

Some candidates could not explain the purpose probably due to failure to get the output of the flowchart.

**Expected Responses**

From the given output one would be quick to note that it is searching for the location of a number in the list and writing 0 if the number is not in the list.

**Question 16(c)**

Write a pseudocode for the above flowchart.

Candidates were required to write a pseudocode for the flowchart.

**Weaknesses**

Some candidates did not write the pseudocode correctly. The main cause of the weaknesses observed in this question is lack of familiarity with analysis of flowcharts, as well as lack of ability to convert a flowchart to a pseudocode. Inadequate preparation by the teachers was noted.

**Expected Responses**

The question required direct translation from the flowchart to a pseudocode. It was therefore expected that the candidates would come up with the following pseudocode.

1       Set DATA[N+1] = ITEM

```
Set Loc = 1 [initialization]
2 Repeat Step 3 while DATA[LOC] ≠ ITEM
3 LOC = LOC + 1 [Increment Loc by 1]
4 If LOC = N + 1 then set LOC = 0
5 Print LOC
6 Exit
```

### Advice to Teachers

Teachers should also advise candidates to always test their program designs by use of sample test data such as the one provided in the question. Testing one's design is a major ingredient of program development.

### 24.2 PAPER 2 (451/2)

#### Question 1b (i) & (ii)

- 1 The information given below is on products, suppliers and orders for a departmental store.
  - Table 1 (products table) contains four fields representing product ID, the name of the product, the retail price of a unit of the product and the number of units of the product in stock respectively. The unique identifier of a product is its “**product ID**”.
  - Table 2 (suppliers table) contains five fields representing supplier ID, the name of the supplier, the supplier's contact address, town and telephone number respectively. The unique identifier of a supplier is the “**supplier ID**”.
  - Table 3 (orders table) contains seven fields representing order ID, products ID, supplier ID, the wholesale price of a unit of the product ordered from the supplier, the number of units of the product, the date the product was ordered and the date the ordered product was received respectively. The unique identifier of a product is its **order ID**.

**Table 1 (Products table)**

1	Kimbo 1kg	100	300
2	Cowboy 1kg	120	180
3	Batteries AAA	50	200
4	Salt 1kg	25	45
5	Sprite 300ml	20	87
6	Dasani 500ml	30	65
7	Baking flour 2kg	89	89
8	Batteries D	60	32
9	Layersmash 70 kg	1,050	54
10	Omo 200g	35	21

**Table 2 (Suppliers table)**

1001	Eveready	54839	Kitale	77777
1002	Unilever	2361	Thika	256782
1003	Bidco	3345	Nairobi	345671
1004	Cocacola	45621	Nairobi	456781
1005	Unga Ltd	52428	Nakuru	26314
1006	Kay Salt	64365	Mombasa	332233

**Table 3 (Orders table)**

10001	1	1002	23	20	12/04/07	13/04/07
10002	5	1003	16	40	11/11/06	
10004	2	1002	25	400	08/08/06	23/09/06
10005	4	1002	18	45	04/04/07	
10006	8	1006	24	50	12/12/06	
10008	7	1005	56	100	02/02/06	
10010	6	1003	20	20	14/03/07	
10013	5	1002	16	100	04/05/07	06/05/07

- (i) Create the relationships between the tables.

- (ii) Create a query to show the name of each product ordered, the retail price, the number of units ordered and the wholesale price.  
The query should contain products whose retail price is below Kshs.50.  
Save as CHEAP.

Part b (i) of this question required candidates to create relationships between the three tables while part (b) (ii) required the candidates to create a query from the given tables in order to display products whose retail price is below Kshs.50. The query was to display product name, retail price, the number of units ordered and the wholesale price.

#### Weaknesses

In part (b) (i) of this question, some candidates did not complete relationship creation while others could not link the fields that were related. This may have been caused by lack of knowledge on the purpose of enforcing referential integrity in a relationship. In part (b) (ii) of the question, some candidates chose the wrong fields, especially for the retail price. They selected all the four fields from the orders table instead of selecting retail price from the products table as well as the product name while the other two fields were to be selected from the orders table. This may have been caused by wrong naming of fields, they named both retail price and wholesale price the same way e.g price or unit price hence the failure to distinguish between the two when creating the query

#### Advice to Teachers

In part (i) of the question, candidates should have created a relationship between the three tables by linking the product ID from the products table with product ID in the orders table and then link the supplier ID in the suppliers table with the supplier ID in the order table. After linking, candidates were required to ensure that the link depicts the one to many relationships for each link. This could have been done by enforcing referential integrity constraints in order for the relationship to be reliable.

Candidates need to be keen when selecting fields for query creation. When setting up a selection criteria, they should be keen so that they apply the criteria on the correct field. Teachers should guide candidates on factors to consider when naming fields in a database and when selecting fields for a query. Teachers should teach the importance of relationships and data integrity.

#### Question 2 d (i)

- 2 Faida distributors sells its products using ten sales representatives who are deployed at various regions. Each sales representative presents weekly sales to the sales manager. Four values are submitted each month as shown in table 4 below. (Values are in Ksh)

Table 4

1	O. Ouko	12345	23405	17200	19450
2	J. Wariahe	34470	24500	19465	20200
3	B. Achieng	33000	26760	30750	19225
4	Z. Kazungu	15430	17665	12992	15789
5	R. Wambua	33412	37895	40217	22433
6	S. Musuva	13415	29334	20780	22900
7	N. Wanjiku	14520	28455	30200	16700
8	F. Chepkoech	25240	34285	25750	25625
9	G. Juma	30420	20400	24600	30200
10	P. Kamau	35520	32255	35400	31500

Each sales representative is paid a monthly commission depending on performance. Sales in the range of Ksh 0-65,000 attract a commission of 5%. Any additional sales attract a commission of 12%.

- (d) Use functions to determine the:  
(i) commission for each sales representative;

This question required the candidates to use a function to determine the commission for each sales representative. This question called for the use of a selection function since the percentage commission was based on a range of total sales.

#### **Weaknesses**

Quite a number of candidates were unable to compute the commission. Some candidates decided to use manual computation and inserted a figure as commission; this was not as per expectation since the question was testing on use of spreadsheet functions. This was probably caused by inadequate preparation on the use of functions in spreadsheets.

#### **Expected Responses**

Assuming the total sales for the first sales representative is in column F in cell F4 then the following formula would be ok if typed in cell G4

=IF(F4>65000,65000\*0.05 + (F4-65000\* 0.12, F4\*0.05)

Or

=IF(F4<=65000, F4\*0.05, 65000 \* 0.05 + (F4-65000) \* 0.12)

After computing the commission for the first cells representative, the candidates should then have copied the formula into the rest of the column so as to compute for the remaining cells representative.

#### **Advice to Teachers**

Teachers should give more time and more examples on how to use functions.