3.9 COMPUTER STUDIES (451)

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

3.9.1 CANDIDATES' GENERAL PERFORMANCE

The table below shows performance in Computer Studies in the year 2009, 2010, 2011 and 2012.

Table 16: Candidates' Overall Performance in Computer Studies for the last four years

Year	Paper	Candidature	Maximum Score	Mean Score	Standard Deviation
2009	451/1		100	45.41	16.48
	451/2&3		100	50.93	16.39
	Overall	**6115**	**200**	**96.33**	**30.92**
2010	451/1		100	51.98	17.38
	451/2&3		100	59.83	16.86
	Overall	**7045**	**200**	**111.81**	**32.30**
2011	451/1		100	52.76	16.77
	451/2&3		100	62.27	13.92
	Overall	**7455**	**200**	**115.02**	**29.03**
2012	451/1		100	54.59	17.82
	451/2&3		100	60.83	15.34
		8069	**200**	**115.35**	**31.70**

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

3.23.1.1 Candidature increased from **7455 in 2011** to **8069** in **2012** representing **8.24%** increment.

3.23.1.2 Performance in ***paper 1***(451/1) improved from a mean of **52.76%** in **2011** to **54.59 %** in **2012**, representing **3.47%**

3.23.1.3 Performance in both the ***practical paper (451/2)*** and the project ***paper (451/3)*** dropped from **62.27%** in **2011** to **60.83%** in **2012** representing **2.31%**

3.23.1.4 Overall performance in the subject improved from a mean **115.02** in the year **2011** to **115.35** In the year **2012** representing **2.87%.**

Questions which were poorly performed in 2012 are briefly discussed below.

3.9.2 Computer Studies Paper 1 (451/1)

Section A

Question 4

(a) What is meant by Data Communication Equipment? (1 mark)

(b) List **six** examples of Data Communication Equipment. (3 marks)

Requirements

Candidates were required to explain what Data Communication Equipment is and to give examples of data communication equipment.

Weaknesses

Most of the candidates did not know the examples of Data Communication Equipment and included cables as Data Communication Equipment.

Expected responses

(a) Any equipment/device that passes on a network signal. (1 mark)

(b) Modem, Bridges, Gateway, Repeaters, Brouters, Routers, Cables, NIC, hubs/Switches, codec, computer, multiplexer/demltiplexer, Nanostations, phone.

Advice to the teachers

The teachers should guide their students well on the differences between DTE and DCE.

Question 9 (b)

protocols used in sending and receiving of emails. (1 mark)

Requirements

Candidates were required to state protocols of for sending and receiving emails.

Weaknesses

Many candidates gave function descriptions of protocol stating the email protocols

Expected responses

SMTP, IMAP, POP3, MIME, HTTP

Advice to the teachers

Teachers should teach explicitly and guide the students on the content.

Question 12

State the stage of system development life cycle in which each of the following activities take place:

(a) determination of the cost-effectiveness of a system; (1 mark)
(b) interviews; (1 mark)
(c) replacement of an old system with a new one. (1 mark)

Requirements

Candidates were required to know the stages of **system development life cycle.**

Weaknesses

Most of the candidates confused **preliminary investigation** and **requirement analysis.**

Expected responses

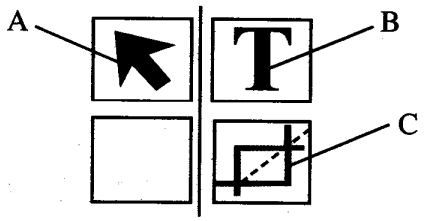
(a) Preliminary investigation/requirements specifications/feasibility
(b) Requirement analysis/fact finding/data gathering/information gathering and maintenance
(c) Implementation stage and maintenance

Advice to the teachers

Teachers ought to put more effort on this topic since it is very important in the project.

Question 13

The figure below is a toolbar for a DTP package.



State the functions of the tools labelled A, B and C. (3 marks)

A: .....

B: .....

C: .....

Requirements

Candidates were required to state the functions of the given DTP tools.

Weaknesses

Majority of the candidates were unable state the functions to the given tools.

Expected responses

A: **Selection tool** - used for selecting/choosing/highlighting objects on the work area.
B: **Text tool** - used for enabling typing/editing or insertion of text.
C: **Cropping tool** - used for trimming graphics.

Advice to the teachers

Teachers should expose students to a variety of DTP packages other than those of Microsoft.

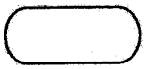
SECTION B

Question 16

(a) State the use of each of the following flowchart symbols. (3 marks)

(i) 

(ii) 

(iii) 

(b) Below is an algorithm that is used to compute the values of R, S and T.

```
P = 5
Q = 6
INPUT N

If N is GREATER OR EQUAL TO 10
R = P * Q
S = Q - P
T = P + Q + R + S
ELSE
R = P + Q
S = Q
T = R + S
END IF
PRINT R, S and T
```

From the algorithm, determine the output if the input value of N is:

(i) 7; (3 marks)

(ii) 10. (3 marks)

(c) Draw a flowchart for the algorithm in Question 16 (b). (6 marks)

Requirements

The candidates were required to:
i) State the use of the flow chart symbols;
ii) Determine the output and input values from a given algorithm;
iii) Draw a flowchart for the algorithm.

Weaknesses

Many candidates had problems in stating uses of flow chart symbols, determining output and input drawing the flow chart

Expected responses

(a) (i) An entry from, or an exit to another part of the program flowchart that is within the same page.
It is an on page connector.

(ii) A connector used instead of the connector symbol to designate entry to or exit from a page.
It is an off page connector

(iii) The beginning and/or end in a program.
To start and/or stop/terminate in a program.

(b) (i) P = 5
Q = 6
N = 7

IF N ≥ 10 THEN

ELSE

R = P + Q = 5 + 6 = 11

S = Q = 6

T = R + S = 11 + 6 = 17

R	S	T
11	6	17

(ii) P = 5

Q = 6
N = 10

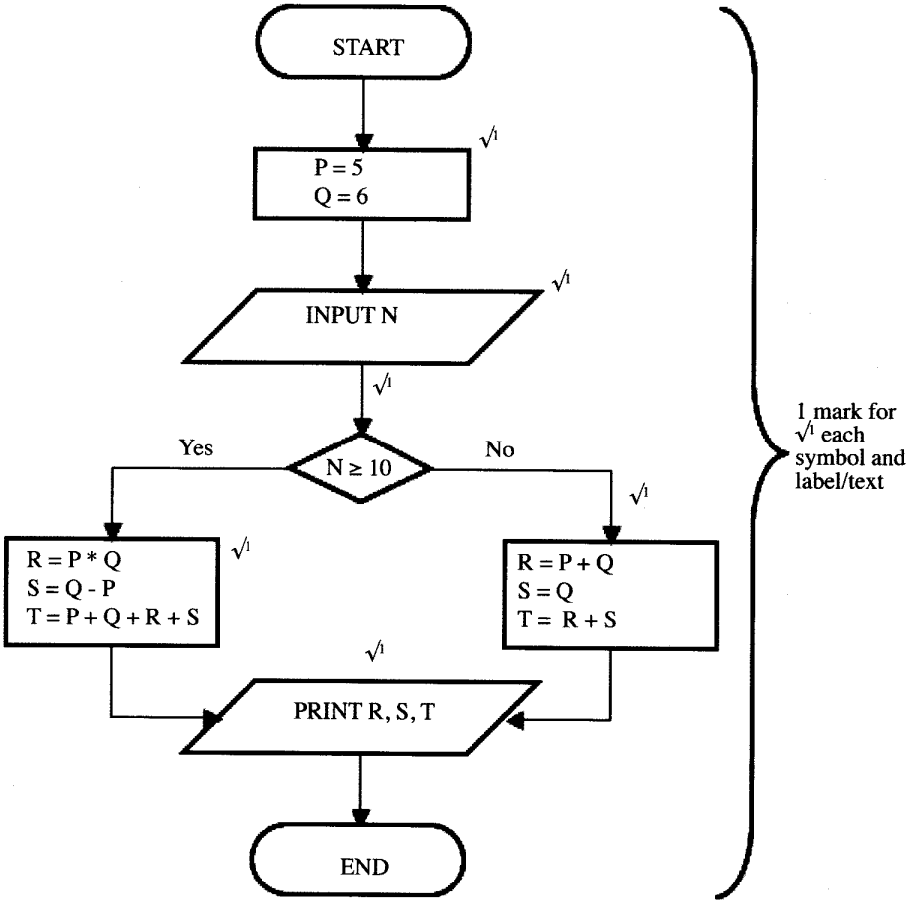
R = P * Q = 5 + 6 = 30

S = Q - P = 6 - 5 = 1

T = P + Q + R + S = 5 + 6 + 30 + 1 = 42

R	S	T
30	1	42

(c)



Advice to the teachers

Teachers to give candidates more practice in the topic.

Question 20

(a) With the aid of a diagram, describe the Hierarchical Database Model. (4 marks)

(b) List **three** factors that should be considered when developing a database application and give reasons why each should be considered. (6 marks)

(c) (i) Name **three** types of validation checks during data entry. (3 marks)
(ii) Differentiate between primary key and index key. (2 marks)

Requirements

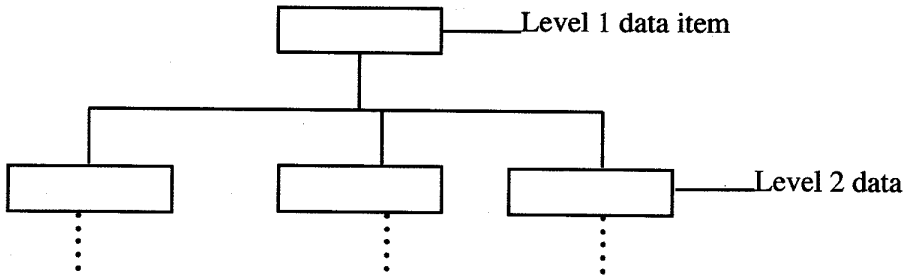
Candidates were required to understand and apply Database Design.

Weaknesses

Many candidates did not attempt this question and those who attempted performed poorly.

Expected responses

(a)



- Data items are arranged in a tree like format.
- Access is through a single path and all from one single item called the root component.

(b) **Factors**

- Complexity of data/user needs/user friendliness
- Security and integrity
- Complexity of DBMS
- Volume of data/size
- Software compatibility with existing DBMS
- Cost of the data base

Reasons

- Complexity of data - Complex data requires complex DBMS.
- Security and integrity - Data which is intended to be secured in terms of access, can be handled by complex DBMS which provides for such requirements.
- Complexity of DBMS - Complex DBMS do require complex skills, hence more training. It is therefore costly to run/use such system.
- Volume of data - Voluminous data require to be ran on stable application. They also take up extra computer system resources.

- Software compatibility - enables pre-existing databases to be exported to the new one.

(c) (i)
- Field type/data type
- Field size
- Format
- Reasonableness
- Range constraint
- Presence check

(ii) Any **index key** is a database feature used to speed up search and sort operations in a table;
whereas
a **primary key** is a field that enforces uniqueness in a table so that one record is not entered twice
or
a **primary key** is a field that uniquely identifies each record.

Advice to the teachers

Teachers to guide the students in acquiring the important concepts in database design

3.9.3 Computer Studies Paper 2 (451/2)

Question 1

Tip Top consultants has shortlisted candidates for an interview for various positions in their organization. The following is a standard letter for each of the candidates to be interviewed. The information enclosed in << >> represents details about recipients, positions, dates and time of the interview.

(a) Using a word processor, type the document as it appears and save it as **LetterMain**.

(16 marks)

Tip Top Consultants

Top Human Resources Consultants

P.O. Box 456,
Nairobi.

Tel: 0322232514233

Email: Info@tiptop.co.ke

Monday, 11 April 2009.

<<First Name>> <<Second Name>>,
P.O. Box <<Address>>,
<<Town>>.

Dear <<Title>> <<Second name>>,

RE: INVITATION FOR AN INTERVIEW

Following your application for the position of <<Position>> , I am glad to inform you that you have been shortlisted. You will be required to report for an interview on <<Date>> at <<Time>>. You are required to bring the following documents with you.

- Identity Card
- Original Certificates
- Two passport size photographs
- A reference letter.

We are looking forward to seeing you.

Yours faithfully,

Suku Nzolata
Consulting Partner

(b) Insert the following as a footer:
Vision: "*To be a leader in the provision of quality Human Resource for development*"

(2 marks)

(c) Create the logo in Figure 1 and position it below the statement '*Top Human Resources Consultants*'.

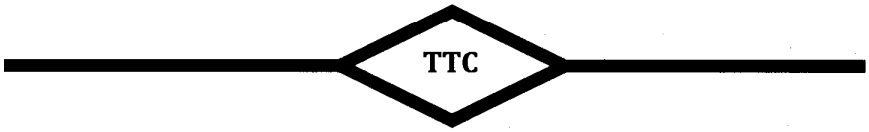


Figure 1 (6 marks)

(d) Table 1 shows details about shortlisted candidates. Create a data source to store information in the table and save it as **ListFile**. (11 marks)

Title	First Name	SecondName	Address	Town	Position	Date	Time
Miss	Anyango	Wafula	365675	Kisumu	ICT Assistant	6th Dec	11:30 am
Ms	Caroline	Kandai	3456	Kajiado	Accountant	6th Dec	12:30 pm
Mr	Zachary	Esokon	123	Lodwar	ICT Assistant	7th Dec	1:30 pm
Mrs	Susan	Chemutai	721	Eldoret	Accountant	7th Dec	2:30 pm
Mr	Jilo	Buya	222	Mombasa	Accountant	8th Dec	12:00 pm
Mr	Sospeter	Kamau	912	Kiambu	Accountant	9th Dec	12:30 pm

Table 1

(e) Using mail Merge feature, merge the files **LetterMain** and **ListFile** and save the document as **Merged Document**.

(5 marks)

(f) Insert page numbers at the top right hand side in the merged document saved in (e) above.

(2 marks)

(g) Using **ListFile** as a data source, create a list of addresses to be printed on envelopes as shown in Figure 2 and save it as **envelopes**. (4 marks)

<<Title>> <<First Name>> <<Second Name>>,

P.O. Box <<Address>>,

<<Town>>.

Figure 2

(h) Print the following: (4 marks)

(i) LetterMain;

(ii) ListFile;

(iii) Page 5 of the Merged document;

(iv) Address to be printed on the first envelope.

Requirements

Candidates were required to:

a. Typeset a standard document and mail merge;
b. Insert a footer and header page number ;
c. Create an object ;
d. Create data source;
e. Insert merge fields;
f. Create envelops;
g. Print work;

Weaknesses.

Candidates were unable to:

- understand information in angle brackets;
- insert footer and page number as a header;
- draw objects;
- create a data source;
- insert merge fields;
- create envelops;
- Print their work.

Expected responses

1. (a)	- Title: TIP TOP CONSULTANTS - Subtitle - addresses Date (Monday, 11 April 2009) - recipient address block - reference (typing) - double underline bolding - justification - bullets - salutation - body text (3 sections @ 1 mark each) - saving (letter main)	2 marks 1 mark 2 marks 1 mark 1 mark ½ mark 1 mark ½ mark 1 mark 1 mark 1 mark 3 marks 1 mark
		16 marks
(b)	Footer text position (in the footer area)	 1 mark 1 mark
		2 marks
(c)	Logo - 3 objects x 1 - text - line weight - positioning	 3 marks 1 mark 1 mark 1 mark
		6 marks

(d)	Data source - creating 8 fields x $\frac{1}{2}$ - each record 6 x 1 - saving (List file)	 4 marks 6 marks 1 mark
		11 marks
(e)	Merging - positioning 9 fields correctly - saving (merged document)	 $4\frac{1}{2}$ marks $\frac{1}{2}$ mark
		5 marks
(f)	Page numbering	2 marks
(g)	Producing envelopes Fields (@ $\frac{1}{2}$ mark per field) Layout (@ $\frac{1}{2}$ mark per line)	 $2\frac{1}{2}$ marks $1\frac{1}{2}$ marks
		4 marks
(h)	Printing - main letter - data source - merged document page 5 - print the first envelope	 1 mark 1 mark 1 mark 1 mark
		4 marks

Advice to teachers

Teachers should assist learners in:

- creation and understanding of standard document for mail merge;
- manipulation of headers and footers;
- inserting of different forms of objects and features in a document;
- using free form objects and free form text in word processing;
- creation of a named data source with correct field names;
- inserting merge fields into standard document and in correct positions;
- creating and printing envelops fro data source;
- Printing documents in different orientation from different pages.

Question 2

Company XYZ sells products P, Q and R. Figure 3 shows an extract of a spreadsheet for the company's salespersons and their respective sales in shillings for each product.

	A	B	C	D	E	F	G	H
1	SALES PERSON	PRODUCT P	PRODUCT Q	PRODUCT R	TOTAL SALES	POINTS	CATEGORY	TOTAL PAY
2	Thomas	4,000.00	6,230.00	7,500.00				
3	Jane	4,500.00	6,700.00	8,000.00				
4	Gabriel	5,678.00	10,000.00	7,800.00				
5	Kipkorir	3,200.00	4,000.00	9,600.00				
6	Anyango	8,000.00	7,005.00	8,900.00				
7	Nekesa	9,800.00	9,670.00	10,000.00				
8	Kinuthia	2,700.00	3,400.00	2,300.00				
9	TOTAL							

Figure 3

(a) (i) Using a spreadsheet package, enter the above information and save it as **SALES_TABLE.** (9 marks)

(ii) Format the worksheet to appear as it is. (4 marks)

(b) (i) Type a formula:

(I) at cell B9 to compute the total sales for product P; (1 mark)

(II) at cell E2 to compute the total sales for Thomas. (1 mark)

(ii) Apply the formulae to the appropriate cells. (2 mark)

(c) A salesperson earns points for the sales of each product based on the following criteria;

- 1 point for every shs 50 for product P,
- 2 points for every shs 65 for product Q,
- 3 points for every shs 40 for product R.

(i) Type a formula in cell F2 to compute the total points earned by Thomas; (3 marks)

(ii) Apply the formula in (c)(i) to the rest of the salespersons. (1 mark)

(d) A salesperson is categorized based on points earned as follows.

POINTS RANGE	CATEGORY
over 1300	Gold
1101-1300	Silver
Up to 1100	Bronze

Those salespersons attaining a Gold category earn a promotion.

(i) Type a formula in G4 to determine Gabriel's category. (5 marks)

(ii) Apply the formula in (d)(i) to other appropriate cells. (1 mark)

(iii) Type a formula at G10 to determine the number of salespersons who will earn a promotion. (4 marks)

(e) Each salesperson earns a total pay of Shs 20,000 plus 2% commission of their total sales. Using absolute referencing, determine the total pay for each salesperson if the value 2 is entered in ceil B12. (5 marks)

(f) Create a bar chart showing Product P and product R sales for each sales person. Insert appropriate labels on the chart. (9 marks)

(g) Rename the worksheet containing the data as **SalesData** and the chart sheet as **SalesChart.** (2 marks)

(h) Print the following: (3 marks)

(i) **SalesData**;

(ii) **SalesData** showing the formulae;

(iii) **SalesChart.**

Requirements

Candidates were required to:

a. enter data into a work sheet;
b. create formulae and copy it across cells;
c. use formulae;
d. use of conditional formulae;
e. use absolute cell referencing and inserting of descriptive text(labels);
f. create and label a chart;
g. rename worksheet and chart sheet;
h. Printing a worksheet, chartsheet and a worksheet with formulae.

Weaknesses.

Candidates were unable to:

- Type without spelling mistakes;
- Create the correct formulae;
- Use formulae;
- Create conditional functions;
- Refer to the cells using absolute referencing;
- Select the required data to plot a chart and label it;
- Rename the chartsheet and the worksheet;
- Print the worksheet showing formulae.

Expected responses

2. (a)	(i) Each row x 1 mark All other labels Saving	7 marks 1 mark 1 mark
		9 marks
	(ii) Format currency Bolding of labels - header row & total Double border/Text wrap All other borders	1 mark 1 mark 1 mark 1 mark
		4 marks
(b)	(i) I. Formula at B9 = Sum (B2:B8) OR = B2 + B3 + B4 + B5 + B6 + B7 + B8 NB: Accept any other correct formulae from other spreadsheet packages II. Formula at E2 = Sum (B2:D2) OR = B2 + C2 + D2 (ii) Application of formulae on **row** and **column**	1 mark 1 mark 2 marks
		4 marks
(c)	(i) Formula in cell F2 = B2/50 + C2/65 * 2 + D2/40 * 3 or = int (B2/50) + int (C2/65) * 2 + int (d2/40) *3 or = int(B2/50 + C2/65 * 2 + D2/40 *3 (ii) Formula application/copying	3 marks 1 mark
		4 marks

(d)	(i) Formula in G4 = IF(F4 > = 1300, "Gold", IF(F4 > = 1100, "Silver", "Bronze")) (ii) Formula application (iii) Formula at G9 = COUNTIF(G2:G8, "GOLD") Label (those to be promoted)	 5 marks 1 mark 3 marks 1 mark
		10 marks
(e)	Formula at H2 = 20,000 + B12/100 * E2 Entering 2 and label (commission)	 4 marks 1 mark
		5 marks
(f)	Chart (Bar) Select the ranges x 1 mark per column 2 marks for product R Invoke correct chart Label x-axis and y-axis Legend Title (chart)	 4 marks 1 mark 2 marks 1 mark 1 mark
		9 marks
(g)	Renaming sheets - Data sheet - Chart sheet	1 mark 1 mark
		2 marks
(h)	Printing (i) Sales data (ii) Sales data showing formulae (iii) Sales chart	1 mark 1 mark 1 mark
		3 marks

Advice to teachers

Teachers should assist learners in:

- Keyboarding skills and methods formulating a worksheet;
- Use of formulae using cell referencing(relative & absolute);
- Using variety of conditional functions available in spreadsheets;
- Use different ways of ways of referencing a value in a cell and labeling the result appropriately;
- Create different types of charts ,placing and formatting it in the required position;
- Renaming worksheets and chartsheets;
- Print different worksheets in pages and changing a worksheet to display formulae.