INSTRUCTIONS TO CANDIDATES

This paper has TWO sections; A and B.
Answer ALL the questions in section A.
Answer question 17 (compulsory) and any other THREE questions from section B.
All answers should be written in the spaces provided on the question paper.

For Official Use Only

<table>
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<tr>
<th>SECT.</th>
<th>QUES.</th>
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This paper consists of 12 printed pages
SECTION A

Answer all the questions in this section.

1 State any three differences between a micro-computer and a mainframe. (3 marks)

Distinguish between hardware and software. (2 marks)

3 In most computer systems, there are devices for input only, output only and some which can be used for both input and output. Give one example of:
   (a) An input only device
   (b) An output only device
   (c) An input and output device (3 marks)

4 List any three possible causes of loss of programs and data. (3 marks)
Table 1 shows three data files, Doc A, Doc B and Doc C and their respective contents.

<table>
<thead>
<tr>
<th>Doc A</th>
<th>Doc B</th>
<th>Doc C</th>
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<tbody>
<tr>
<td>27</td>
<td>93</td>
<td>27</td>
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<tr>
<td>36</td>
<td>60</td>
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<td>102</td>
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<td>45</td>
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<td>45</td>
<td>34</td>
<td>38</td>
</tr>
<tr>
<td>102</td>
<td></td>
<td>102</td>
</tr>
</tbody>
</table>

Table 1

State the dos command that can be used to create file Doc C from files Doc A and Doc B. (1 mark)

Explain why a program written by you cannot occupy the entire part of the RAM memory of your computer. (1 mark)

Define the term data processing cycle. (1 mark)

In the following section of text, you wish to replace the word 'the' with the word 'a'. "Enclosed is a bill for the car you bought from Mutheru's shop in Kiambu". You have a command that will search globally for a group of characters and replace them with another group.

(a) What group of characters would need to be searched? (1 mark)

(b) What group of characters would be needed for replacement? (1 mark)

Turn over
List the **three** basic program control structures.  

10 The following algorithms are intended to print out integers from 1 to 10 inclusive

**Algorithm 1**
Set count to 1
While the count is less than 10 do
Add 1 to the count
Output the value of the count
End while.

**Algorithm 2**
Set count to 1
Repeat
Output the value of the count
Add 1 to the count
Until the value of the count is 10

**Algorithm 3**
For count going from 1 to 10 DO
Add 1 to count
Output the value of the count
End for.

None of these algorithms works correctly. Rewrite the algorithms so that each one works correctly.
Table 2 below shows a screen from a spreadsheet program that has been used to plan a household budget. Cells in the spreadsheet are referred to by column letters and row numbers. Two examples of this are given below. The cell in column D and row two is referred to as cell D2. It contains the data item "Ksh. 46000". The cell in column A and row 5 is referred to as A5. It contains the data item "charcoal"

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Month</td>
<td>January</td>
<td>February</td>
<td>March</td>
<td>April</td>
</tr>
<tr>
<td>2</td>
<td>Rent</td>
<td>46000</td>
<td>46000</td>
<td>460-00</td>
<td>460-00</td>
</tr>
<tr>
<td>3</td>
<td>Transport</td>
<td>000</td>
<td>000</td>
<td>250-00</td>
<td>250-00</td>
</tr>
<tr>
<td>4</td>
<td>Electricity</td>
<td>10000</td>
<td>10000</td>
<td>100-00</td>
<td>10000</td>
</tr>
<tr>
<td>5</td>
<td>Charcoal</td>
<td>15000</td>
<td>15000</td>
<td>15000</td>
<td>15000</td>
</tr>
<tr>
<td>6</td>
<td>Food</td>
<td>38000</td>
<td>270-00</td>
<td>15000</td>
<td>30000</td>
</tr>
<tr>
<td>7</td>
<td>Total</td>
<td>109000</td>
<td>98000</td>
<td>111000</td>
<td>126000</td>
</tr>
</tbody>
</table>

(a) Write down the data item that is stored in cell E6. (1 mark)

(b) Which cell contains the data item 'Transport'? (1 mark)

(c) Cell B7 contains a formula that is not displayed on the screen. The formula is sum B2 ... B6 or B2 + B3 + B4 + B5 + B6. What is the purpose of the formula? (1 mark)

12 (a) State any two components of a local area network. (2 marks)

(b) List any two uses of computer facilities in schools. (2 marks)
13 Explain **three** advantages of using a database instead of conventional computer file. (3 marks)

14 Two major cities are 100km apart. There is a proposal to link the two metropolitan area networks (MANS) together. Select with reasons the most suitable communication media in this application. (4 marks)

15 Explain **two** effects of computer technology on career opportunities in the work place. (2 marks)
Below is a list of 11 job titles in computer industry.

1. System analyst
2. Computer operator
3. Data processing manager
4. Database administrator
5. Computer engineer
6. Computer technician
7. Information resource manager
8. Network administrator
9. Computer trainer
10. Software engineer
11. Computer programmer

Using the titles above write down the correct job title of the person doing the following jobs:

(a) Keying in data .................................................................

(b) Daily backup of information ...........................................

(c) Repairing computers ......................................................

(d) Training computer personnel .......................................... (2 marks)
SECTION B

Answer question 17 and any other three questions.

With the aid of a flowchart, write a program in a highlevel language to read any amount of dollars and convert it into Kenya shillings. The output must be in Kenya shillings.
Assume the variables, dollars, exchange-rate and shillings as real numbers. (15 marks)
Microcomputers have had a considerable impact on office procedures in recent years. Discuss the procedures that have been affected and in each case give an explanation of how the software is applied. (15 marks)
19  (a) Describe methods of data collection recommended as input to computer systems in stock ordering in a supermarket.  

(b) A vendor proposed to a supermarket a voice recognition system of data capture. List the advantages and disadvantages of this device.  

(9 marks)  

(6 marks)
A school uses a computer to store information on its pupils. The examination results of the pupils are held in a coded form. Some of the fields used are as follows: Subject, level, mark obtained and date of examination. The codes used for each field are:

Subject 001 = Literature
02 = Chemistry
304 = Geography

Level 02 = KCPE
03 = KCSE
04 = ORAL

The "mark" is a 3 digit number in the range of 000 to 100. Date of examination is written in the following way:
1087 = October 1987
0686 = June 1986

(a) Interpret the following codes
(i) 102020560585

(ii) 001040831187

(b) Encode a mark of 65 in a KCSE Chemistry examination taken in November, 1984.

(c) It is possible to make errors when entering information. State the conditions required to validate in the:
(i) date field.

(ii) mark field.

(d) State with reasons an example of three extra fields that might be useful.

Turn over
21 (a) State five reasons why we need computer networking. (5 marks)

(b) With the aid of appropriate diagrams describe the following topologies as used in local area network:

(i) Bus network

(ii) Star network (10 marks)
INSTRUCTIONS TO CANDIDATES

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Answer ALL the questions in section A.
Answer question 16 (compulsory) and any other THREE questions from section B.
All answers should be written in the spaces provided on the question paper.
SECTION A (40 marks)

Answer all questions in this section.

1 State any three functions of a computer. (3 marks)

2 Give two types of storage devices used in a computer giving an example of each. (4 marks)

3 Give any three precautionary measures considered to ensure the safety of computers in a computer laboratory. (3 marks)

4 Define

(a) File

(b) Record

(c) Field

(3 marks)

5 List two features of a word processor. (2 marks)

6 Differentiate between the hardware and software components of a computer giving an example of each. (4 marks)
7 What is program documentation? Give two examples of program documentations. (3 marks)

8 Give two differences between high-level and low-level languages. (2 marks)

9 Worksheet cells are referenced using the column letter and row number e.g. D2 is cell in column D and row 2. Use the sample worksheet provided to answer the questions below.

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
</tr>
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<tbody>
<tr>
<td>2</td>
<td>Fees</td>
<td>460</td>
<td>460</td>
<td>460</td>
<td>460</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Food</td>
<td>300</td>
<td>350</td>
<td>305</td>
<td>270</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Electricity</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Fuel</td>
<td>150</td>
<td>150</td>
<td>150</td>
<td>150</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Transport</td>
<td>380</td>
<td>270</td>
<td>150</td>
<td>300</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Total</td>
<td></td>
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</tbody>
</table>

(a) Write down the data type that is stored in cell C5. (1 mark)

(b) What cell contains the data item representing transport for the month of February? (1 mark)

(c) Write down the formula that may be used to compute the total in cell F6. (1 mark)
SECTION B (60 marks)

Answer question 16 and any other three questions.

16 The roots of the equation $ax^2 + bx + c = 0$ are given by the formula

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

(a) Draw a flow-chart to compute the roots of the equation. (10 marks)
(b) Using the flow-chart in (a), write a program that will compute the roots and
If \( b^2 - 4ac \) is negative, the program should display the message "NEGATIVE".

(5 marks)

A multinational organisation has offered to donate computers to your school. The Board of Governors has requested you to advise on the operating system to be used by providing answers to the following questions:

(a) What is an operating system?  

(1 mark)

(b) State and briefly explain any two types of operating systems.  

(6 marks)
(c) Briefly explain any **four** functions of an operating system. (8 marks)

(a)  
(i) State **one** area where computers are used.  
(ii) Give any **two** advantages of using computers in this area. (6 marks)

(b) Explain the effect of computer technology in the following areas:  
(i) Job opportunities  
(ii) Job skills  
(iii) Communication. (9 marks)

*Turn over*
A Computer Vendor has recommended the use of a computer database to your school for students information.

(a) Explain to the Board of Governors what a database is and its functions. (5 marks)

(b) Give two examples of database systems. (2 marks)

(c) Briefly explain any two advantages and two disadvantages of using a database. (8 marks)

(a) What is a computer network topology? (2 marks)

b) Using appropriate diagrams, show any three computer network topologies. (9 marks)
(c) Briefly explain **two** reasons why organisations need to network their computers.  
(4 marks)
THE KENYA NATIONAL EXAMINATIONS COUNCIL

Kenya Certificate of Secondary Education

COMPUTER STUDIES

Paper 1
(Theory)

Oct/Nov. 2000
2\(\frac{1}{2}\) hours

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<td><strong>Total Marks</strong></td>
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SECTION A (40 marks)

Answer the all questions in this section.

1 Write the following abbreviations in full. (3 marks)
   (i) BCD
   (ii) ASCII
   (iii) EBCDIC

2 Define the term array as used in computer programming. (2 marks)

3 Suggest how computers may in future be made more user friendly for persons that are: (2 marks)
   (a) blind
   (b) without hands

4 State three advantages of computer networking. (3 marks)

5 Name six steps in program development cycle in their logical sequence. (3 marks)
State two methods of minimising dust in a computer laboratory. (2 marks)

Differentiate between primary memory and secondary memory. (2 marks)

List the steps that you would use to correct wrongly spelt words in a document using the spell checking feature. (3 marks)

Differentiate between single-user and multi-user operating systems giving an example of each. (3 marks)

State what is meant by each of the following and give an example of where each is used.

(a) Magnetic Ink Character Recognition (MICR) (2 marks)
11 In the following flowchart, what will be the value of the sum when printed? Show how you arrive at your answer.

(b) Optical mark reader (OMR)
12 Distinguish between system software and application software. (2 marks)

13 Explain any three of the terms: creating, editing, printing and saving as used in wordprocessing. (3 marks)

14 List three file organisation methods in a computer. (3 marks)

15 What is the use of the search and replace feature in a wordprocessor? (2 marks)
SECTION B (60 marks)

Answer Question 16 and any three other questions.

16 A program is required for reading in a student's name and the scores obtained in two subjects. The output of the program will consist of the student's name, the two scores, the average of the two scores and a comment. The comment is based on the average as follows:

<table>
<thead>
<tr>
<th>Average</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 70</td>
<td>Good</td>
</tr>
<tr>
<td>≤ 70</td>
<td>Poor</td>
</tr>
</tbody>
</table>

Write a program to solve the problem using a high level language. (15 marks)
(a) What is meant by data communication in a computer network? (2 marks)

(b) State what is meant by each of the following transmission media and give one advantage and one disadvantage for each.

(i) Twisted pair cables. (3 marks)

(ii) Coaxial cables. (3 marks)

(iii) Optic fibre cables. (3 marks)
(c) List **four** network elements in a local area network. (4 marks)

18 Andrew, Jane, David and Zablon had tea, sausages and bananas for breakfast. They took one sausage, two sausages, three sausages and one sausage respectively. In addition, they each took a cup of tea and two bananas. Tea, sausages and bananas cost Ksh. 10, 15, and 5 respectively.
By naming columns A, B, C,…… and rows 1, 2, 3……:

(a) construct a worksheet showing the above information. (7 marks)

(b) state the expression you would use to obtain:

(i) total expenditure by David. (4 marks)
(ii) total number of sausages taken.  

(2 marks)

(iii) the cost of the cheapest item.  

(2 marks)

19  
(a) What are computer viruses?  

(2 marks)

(b)  
(i) State two ways through which computer viruses may be controlled.  

(2 marks)

(ii) Explain how each of the two ways stated in b(i) above assist in controlling computer viruses.  

(2 marks)

(c) Define each of the following computer terminologies:  

(3 marks)

(i) byte

(ii) bit

(iii) word
(d) Convert the hexadecimal number FC1 to its binary equivalent. (6 marks)

20 (a) A firm intends to purchase new software. List three items that should accompany the software. (3 marks)

(b) State and explain three ways that computer technology could make office work more efficient. (6 marks)

(c) Explain the meaning of each of the following computer crimes: (6 marks)

(i) Hacking

(ii) Fraud

(iii) Piracy
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Answer ALL the questions in section A.
Answer question 15 and any other THREE questions from section B.
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TOTAL MARKS

This paper consists of 11 printed pages
Candidates should check the question paper to ensure that all the pages are printed as indicated and no questions are missing.
SECTION A (40 marks)

Answer all the questions in this section.

Compare the two types of diskettes used in microcomputers in terms of physical size and densities. (2 marks)

Why is it necessary to have a UPS in a computer laboratory? (2 marks)

(a) Explain what is meant by batch processing. (1 mark)

(b) Give one advantage and one disadvantage of batch processing. (2 marks)

List any four high level programming languages. (2 marks)
5 A 3 by 4 matrix array \( M \) is to be added to another 3 by 4 matrix array \( N \) so as to give a third 3 by 4 matrix array \( P \). Using a high level programming language, write a program segment that assigns the sum of \( M \) and \( N \) to \( P \). (4 marks)

6 The first column in the table below contains the formulae as stored into the cell F10 of a spreadsheet. Enter the formulae as they would appear when copied to cell M20 of the same spreadsheet.

<table>
<thead>
<tr>
<th>Formula in F10</th>
<th>Formula in M20</th>
</tr>
</thead>
<tbody>
<tr>
<td>( = D10*E10 )</td>
<td></td>
</tr>
<tr>
<td>( = A$25 )</td>
<td></td>
</tr>
<tr>
<td>( = $D$13 )</td>
<td></td>
</tr>
</tbody>
</table>

(3 marks)

7 Give \textbf{three} advantages of separating data from the applications that use the data in database design. (3 marks)
Explain the impact of information technology on organisations in each of the following areas:

(a) competition  

(b) pace of growth.  

(a) List any four tasks that an electronic spreadsheet should be able to perform other than calculations.  

(b) Explain what is meant by automatic recalculation as used in a spreadsheet.  

10 Describe the functions of the following computer hardware components:

(a) mouse  

(b) scanner.
11 (a) State two differences between Disk Operating System (DOS) and WINDOWS operating system. (2 marks)

(b) (i) Define the term application software. (1 mark)

(ii) Give one example of an application software. (1 mark)

12 (a) Give one difference between internal and external commands in Disk Operating System. (2 marks)

(b) Name two DOS commands that may be used for checking disk errors. (1 mark)

13 Explain how a paragraph can be moved from one place to another in wordprocessing. (2 marks)

14 Define the term structured programming. (2 marks)

Turn over
SECTION B (60 marks)

Answer question 15 and any other three questions from this section.

(a) What is meant by each of the following terms:

(i) pseudocode (14 marks)

(ii) flowchart. (14 marks)

(b) A program is required to list the first 1000 numbers in the series: 2, 4, 6, 8, 10,...

Draw a flowchart and write a program that can be used to carry out this task. (12 marks)
16 The following car details are to be entered in a database: Make, date-of-manufacture, colour and cost.

(a) Prepare a suitable database structure showing field names and their field types. (5 marks)

(b) Explain how you index the data such that cars of the same make and colour are together. (2 marks)

(c) Write a statement that can be used to select cars of colour green. (2 marks)
(d) Give an instruction that would:

(i) select cars whose cost is between 500,000/= and 1,000,000/=  (3 marks)

(ii) determine the average cost of all cars.  (3 marks)

17  (a) The diagram below represents the essential features of a computer system. Study the diagram and answer the questions that follow:

![Diagram of a computer system]

Name the components:  (4 marks)

A  
B  
C  
D
(ii) On the diagram above, indicate the direction of data flow using arrows.

(b) Name the three types of buses in a computer system.

(c) Explain how the CPU registers may be used to carry out a basic calculation such as

\[2 + 7 = 9.\]

(d) Name two computer output devices.

18 (a) State three ways in which computer technology may affect employment patterns in organisations.

(b) (i) State and explain three reasons why the employment patterns are affected.
(ii) Suggest three strategies that can be employed to manage resistance to change. (3 marks)

(c) Give three advantages of computerisation in an organisation. (3 marks)

19 (a) In a computer based information system, state the purpose of the following files and give one example where such a file may be required in a school. (8 marks)

(i) Report file.

(ii) Back-up file.

(iii) Reference file.

(iv) Sort file.
(b) State three precautions that should be taken to ensure that diskettes are well stored. (3 marks)

(c) Distinguish between "serial" and "indexed sequential" file organisation methods. (2 marks)

(d) Distinguish between binary and octal number systems and give an example of each. (2 marks)
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Candidates may be penalised for not following the instructions given in this paper.

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<td>A</td>
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Total marks

This paper consists of 10 printed pages

Candidates should check the question paper to ensure that all the pages are printed as indicated and no questions are missing.
SECTION A (40 marks)

Answer all the questions in this section.

1 Describe the purpose of each of the following computer functional units: (2 marks)
   (a) control
   (b) storage.

2 Explain how each of the following would affect the suitability of a room for use as a computer room: (2 marks)
   (a) burglar proofed door
   (b) availability of taps and sinks in the room.

3 State three data representation codes used in computers. (3 marks)

4 State two types of documentation in program development and give the purpose of each. (4 marks)
5 Suppose a 5 element array $A$ contains the values 9, 12, 17, 7 and 20. Find the value in $A$
after executing the loop below.
    Repeat for $k = 1$ to 4
    Set $A[k + 1] := A[k]$
    [ End of loop ]

6 State any three activities that occur in a program compilation process.

7 The formula $= K20 + P$18 was typed in cell L21 and then copied to cell M24 of a
    spreadsheet. Write the formula as it appears in cell M24.

8 State two ways in which a computer may be used in efficient running of a hospital.

9 List three disadvantages of using traditional file management method.

10 Give one disadvantage of a single processor multi-user system.
List three differences between a micro-computer and a super-computer. (3 marks)

State and explain two reasons why word processing is one of the most common applications of many computer users. (2 marks)

Write 1 in two's complement notation in byte form. (4 marks)

Explain the following input/output terms as used in computer systems. Give an example for each. (4 marks)

(a) Read .................................................................

(b) Write

State two disadvantages of networking. (2 marks)
SECTION B  (60 marks)

Answer question 16 and any other three questions from this section.

16  The following flowchart can be used to list the odd numbers between 0 and 100.

(a)  Write a program segment for the flowchart using a high level language.  (7 marks)
(b) What would be the output from the flowchart if the statement in the decision box is changed to:  

(i) odd = 100  
(ii) odd < 100  
(iii) odd > 100.

(c) Modify the flowchart so that it prints only the sum of the odd numbers between 0 and 100.
17

(a) List five precautions that can be taken to protect data stored in diskettes. (5 marks)

(b) State and explain two precautions that can be taken to help recover data lost through accidental erasure. (4 marks)

(c) Describe each of the following data processing methods: (6 marks)

(i) batch processing

(ii) distributed processing

(iii) multiprogramming.
18 (a) (i) What is a computer keyboard? (1 mark)

(ii) List four types of keys found on a computer keyboard. Give an example of each. (4 marks)

(b) Give four differences between present days’ computers and the older generation of computers. (4 marks)

(c) (i) State three advantages and one disadvantage of using a laser printer. (4 marks)

(ii) Distinguish between a line printer and a page printer. (2 marks)

19 (a) Identify three Public Universities and three National Polytechnics in Kenya where further computer training is offered. In each case, state the highest level of qualification that can be acquired in computer training. (6 marks)
(b) Distinguish between "Job replacement" and "Job displacement" in reference to computerisation. (2 marks)

(c) Give four reasons why a firm may decide to computerise its operations. (4 marks)

(d) An individual has a right to demand guarantee to privacy of personal information stored on a computer. Give three such types of information. (3 marks)

20 (a) Give three comparisons of the traditional method of typing a document on a typewriter against using a word processor. (6 marks)

(b) (i) Define the term spreadsheet. (1 mark)

(ii) Give two examples of spreadsheet packages available in the market today. (2 marks)
(c) Explain the following terms as used in a spreadsheet:

(i) what if analysis (2 marks)

(ii) cell (1 mark)

(iii) formula (1 mark)

(iv) pie-chart (2 marks)
INSTRUCTIONS TO CANDIDATES

This paper consists of TWO sections; A and B.
Answer ALL the questions in section A.
Answer question 16 and any other THREE questions from section B.
All answers should be written in the spaces provided on the question paper.

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</table>

This paper consists of 11 printed pages
Candidates should check the question paper to ensure that all the pages are printed as indicated and no questions are missing.
SECTION A (40 marks)

Answer all the questions in this section.

1 Computer systems are built from three types of physical components: processors, memories and I/O devices.
   (a) State two tasks of a processor. (2 marks)

   (b) State the functions of I/O devices. (1 mark)

2 Threats to the safety of computer systems take many forms such as:
   White-collar crime, natural disasters, vandalism and carelessness.
   Give one way as to how each of these forms of threats can be controlled. (2 marks)

3 (a) Explain the term nibbles as used in data representation in computers. (1 mark)

   (b) Perform the following binary arithmetic giving the answers in decimal notation. (3 marks)
   (i) 11100111 + 1101001 011

   (ii) 1001011-011-111-111
(a) Distinguish between machine and assembly language. (2 marks)

(b) State the type of translator necessary for a program written in:

(i) high level language

(ii) assembly language. (2 marks)

5 Briefly explain the purpose of the following types of program documentation:

(a) user manual

(b) reference guide

(c) quick reference guide. (3 marks)

6 State any two features of a user friendly program. (2 marks)

7 (a) Distinguish between labels and formulae with respect to spreadsheets. (2 marks)
(b) Consider the entries made in the table below.

<table>
<thead>
<tr>
<th>Cell</th>
<th>B2</th>
<th>B3</th>
<th>C10</th>
<th>C11</th>
<th>C13</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entry</td>
<td>200</td>
<td>100</td>
<td>B2</td>
<td>B3</td>
<td>= C10 + C11</td>
</tr>
</tbody>
</table>

State the value displayed in cell C13. (2 marks)

8 List three differences between Wide Area Networks (WAN) and Local Area Networks (LAN). (3 marks)

Study the flowchart segment below and state the last value printed from the flowchart. (2 marks)

10 (a) What is an expert system? (1 mark)
(b) State any **two** components of an expert system.  

Give **two** reasons why optical disks are better storage media compared to floppy diskettes.  

What are the DOS commands used for the following?  

(a) Changing directories.  
(b) Viewing directories.  
(c) Renaming directories.  
(d) Deleting a directory.  

Distinguish between copying and moving text.  

(a) Name two methods of paper orientation.  
(b) Name two keys used to delete text in a document.  

Name two features of a Database package.  

**Turn over**
(b) List the outputs of the flowchart above. (5 marks)

(c) Modify the flowchart so that it adds up all its outputs and displays the sum obtained. (3 marks)
A computer specification has the following details:

- Pentium III
- 144 MB floppy disk drive
- 20 GB hard disk
- Full multimedia
- 17" SVGA monitor
- Pre-installed operating system
- Pre-installed office suite.

(a) What is meant by:

(i) 1.44 MB floppy disk drive?

(ii) 20 GB hard disk?

(iii) 17" SVGA monitor?

(b) Which operating system might be pre-installed in this computer and why? (2 marks)

(c) List three multimedia components. (3 marks)

(d) (i) What is meant by computer aided manufacture? (2 marks)

(ii) Give two examples of computer aided design software. (2 marks)
of network software.

(b) List any three items that may be referred to as data terminal equipment network.

(c) Briefly explain the following terms as used in networking:

(i) remote communication

(ii) distributed processing.

State three advantages and two disadvantages of mesh network topology. (5 marks)
A company has decided to computerise their operations. They have decided to purchase packages instead of developing their own programs. Give three advantages and two disadvantages of this approach. (5 marks)

(b) (i) Explain why a value such as 611233444555 may be displayed as ####### when typed in a cell of a spreadsheet. (2 marks)

(ii) How can the problem in (b)(i) above be corrected? (2 marks)

(c) With reasons, briefly describe the most appropriate type of printer or output device for the output of:

(i) customer invoices on multi-part stationery

(ii) letters to customers

(iii) detailed engineering designs.

(a) Distinguish between the following pairs of terms: (6 marks)

(i) data verification and data validation

(ii) data encryption and passwords

(iii) dry run and walkthrough.
(b) Draw a labelled diagram to illustrate the internal structure of a diskette. (4 marks)

(c) Give two differences between post office mail and electronic mail (E-mail). (2 marks)

(d) Speed and accuracy are some of the advantages of using computers in banking. State three other advantages of use of computers in banking. (3 marks)
INSTRUCTIONS TO CANDIDATES

This paper consists of TWO sections: A and B. 
Answer ALL the questions in section A.
Answer question 16 and any other THREE questions from section B.
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<td>20</td>
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<tr>
<td>TOTAL SCORE</td>
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<td></td>
</tr>
</tbody>
</table>

This paper consists of 12 printed pages
Candidates should check the question paper to ensure that all the pages are printed as indicated and no questions are missing.
SECTION A  (40 marks)

Answer all the questions in this section.

How is a point of sale terminal used in a business organisation?  (2 marks)

Distinguish between a compiler and an interpreter.  (2 marks)

Explain why computers use binary numbers in data representation.  (2 marks)

What is meant by the term dry running as used in program development?  (2 marks)

A computer teacher has put a rule that diskettes should not be used in the Computer Laboratory.

(a) Give a reason for the rule.  (1 mark)
6. List three differences between a laser printer and a dot matrix printer. (3 marks)

7. List four stages involved in the data processing cycle. (2 marks)

8. (a) What is a utility software? (1 mark)

(b) Give four examples of utility software. (2 marks)
9. Distinguish between an intelligent terminal and a dump terminal. (2 marks)

10. List two duties of each of the following personnel:

(a) Database administrator. (2 marks)

(b) Data processing manager. (2 marks)

11. Differentiate between source program and object program. (2 marks)
12. (a) In DOS, what are the following commands used for?

(i) CD—

(ii) DEL *.*

(b) What happens when the following commands are typed in the DOS environment?

(i) CD—

(ii) DIR

13. A student presented a budget in the form of a worksheet as follows.

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Item</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Fare</td>
<td>200</td>
</tr>
<tr>
<td>3</td>
<td>Stationery</td>
<td>50</td>
</tr>
<tr>
<td>4</td>
<td>Bread</td>
<td>300</td>
</tr>
<tr>
<td>5</td>
<td>Miscellaneous</td>
<td>150</td>
</tr>
<tr>
<td>6</td>
<td>Total</td>
<td></td>
</tr>
</tbody>
</table>

The student intends to have spent half the amount by mid-term.

(a) Given that the value 0.5 is typed in cell B9, write the shortest formula that would be typed in cell C2 and then copied down the column to obtain half the values in column B.

(b) Write two different formulae that can be typed to obtain the total in cell B6 and then copied to cell C6.
14 State **three** operations that can be performed on relational database files. (3 marks)

15 List **three** parts that constitute an array definition statement. (3 marks)
SECTION B (60 marks)

Answer question 16 and any other three questions from this section.

16 Bidii wholesalers has two categories of customers for order processing. Category 'A' obtains 10% discount on all orders up to Ksh. 10,000 otherwise the discount is 20% on the entire order. Category 'B' obtains 30% discount on all orders if the debt repayment is 'good' otherwise the discount is 15%. Draw a flowchart for the order processing. (15 marks)

17 (a) List three application areas of artificial intelligence. (3 marks)

4111 Turn over
With the improvement in price and performance of computers and communication equipment, it will be possible for people in various business organisations to work from home. Such working using a PC as a remote terminal is often described as teleworking. State **three** advantages and **three** disadvantages of working from home.  

(12 marks)

Advantages

Disadvantages

Explain **three** ways by which computer users can protect their eyes from harmful emissions from the computer screen.  

(6 marks)
(b) List three factors to be considered when deciding on the choice of an electronic data processing method. (3 marks)

(c) Explain time sharing data processing mode giving two advantages and two disadvantages of its application. (6 marks)

19 A school has bought a Computer System. The hardware items supplied include: a 800MHZ processor, 640 MB of RAM, a sound card, speakers, a monitor, a keyboard, a 12GB hard disk, a floppy disk drive, a CD - Read/Write drive, a mouse, a modem, an inkjet printer and a joystick. The software supplied include: an operating system, a BASIC interpreter and the following packages: spreadsheets, graphics, word processor, art, database and games.

(a) List three input devices from the given specifications. (3 marks)
Explain the meaning of the following:

(i) 800MHZ  
(2 marks)

(ii) 640 MB  
(2 marks)

(iii) 12 GB  
(2 marks)

Some of the students in the school use the computer to do homework.

Name the packages used to:

(i) do calculations and draw graphs  
(1 mark)

(ii) write an essay  
(1 mark)

(iii) make a poster.  
(1 mark)

Students enjoy playing noisy computer games.

(i) Which two hardware items are needed to produce sound?  
(2 marks)
A school organizes its work in directories. The directory WP contains the files CATS, EXAMS and ASSIGNMENTS. The directory SP contains the spreadsheet files. The directory DB contains the database files. The directory PROG is contained in the others directory. The directory WP also contains the PERSONAL directory. Given that the directory student contains directories SP, DB, WP and OTHERS.

(a) Draw the directory tree structure with C as the root.

(b) Write the path at which the contents of the subdirectory DB can be erased or displayed.

(c) Write the path for the directory PROG.
(d) Give two reasons for storing files in directories and subdirectories. (2 marks)

(e) Give two disadvantages of using command driven interfaces as compared to menu driven interfaces. (2 marks)
INSTRUCTIONS TO CANDIDATES

This paper consists of TWO sections; A and B. Answer ALL the questions in section A. Answer question 16 and any other THREE questions from section B.

All answers should be written in the spaces provided on the question paper.

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<td>20</td>
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<tr>
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<td></td>
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</tbody>
</table>

This paper consists of 12 printed pages

Candidates should check the question paper to ensure that all the pages are printed as indicated and no questions are missing.
SECTION A (40 marks)

Answer all the questions in this section.

What is disk formatting? (1 mark)

Indicate whether the following devices are used for input or output. (2 marks)

(i) Plotter

(ii) Light pen

(iii) Mouse

(iv) Visual display unit

Explain why the following controls should be implemented for computer based systems. (2 marks)

(i) Back-ups.

(ii) Passwords.

For each of the following, give one reason why they are not allowed in a computer laboratory. (2 marks)

(i) Smoking.
(ii) Eating foods.

3 Distinguish between Real, Integer and Character data types as used in programming. (3 marks)

4 The cells K3 to K10 of a worksheet contain remarks on students' performance such as very good, good, fair and fail depending on the average mark. Write a formula that can be used to count all students who have the remark "very good". (3 marks)

5 (a) State the purpose of registers in a computer system. (1 mark)

(b) Name two multiprogramming operating systems. (2 marks)

6 (a) A serial file comprises of records placed in positions 1 to 10. State the position of the end of file marker. (1 mark)
State the purpose of each of the following: (2 marks)

(i) file server software

(ii) communication software.

Name the control structure depicted by the flowchart below. (1 mark)

Explain the following terms as used in program implementation. (2 marks)

(i) Parallel running.
Consider the linear arrays:

(i) AAA (5:50)
(ii) BBB(-5:10)
(iii) CCC(18)

Find the number of elements in each array. (3 marks)

Define the term artificial intelligence. (2 marks)

10 Name two types of relationships that can be applied in database design. (2 marks)

11 Explain the following terms as used in wordprocessing: (3 marks)

(a) indenting
(b) alignment

(c) word wrap

Outline two ways in which computers can be used in hotels. (2 marks)

(a) Explain Binary Coded Decimal code of data representation. (1 mark)

(b) Write the number 451 in BCD notation. (1 mark)

Arrange the following data units in ascending order of size.

BYTE, FILE, BIT, NIBBLE. (2 marks)

State two health issues that may result from prolonged use of computers. (2 marks)
Answer question 16 and any other three questions from this section.

State the stage of program development in which:

(i) a flowchart would be drawn

(ii) the programmer would check whether the program does as required

(iii) the user guide would be written

(iv) the requirements specifications would be written.

State the output of the following flowchart segment:

\[
\begin{align*}
\text{A} &= 30 \\
\text{B} &= 28 \\
\text{B} &= \text{A} \\
\text{A} &= \text{B}
\end{align*}
\]

(2 marks)
(i) Draw a flowchart to compute the combined resistance (R) of two resistors R₁ and R₂ in parallel using the formula:

\[
\frac{1}{R} = \frac{1}{R_1} + \frac{1}{R_2}
\]

(5 T marks)

(ii) Write a program using Pascal or C languages for the flowchart in c(i) above.

(5 7 marks)

List three paragraph formatting activities in wordprocessing.

(3 marks)
(b) Differentiate between bolding and highlighting text. (2 marks)

(c) The following information shows the income and expenditure for "Bebayote" matatu for five days. The income from Monday to Friday was Kshs. 4,000, 9,000, 10,000, 15,000 and 12,000 respectively while the expenditure for the same period was Kshs. 2,000, 3,000, 7,000, 5,000 and 6,000 respectively.

Draw a spreadsheet that would contain the information. Indicate the rows as 1, 2, 3, ....... and the columns as A, B, C. . . . . . . . (4 marks)

(ii) State the expression that would be used to obtain:

<table>
<thead>
<tr>
<th></th>
<th>Monday's profit</th>
<th>(2 marks)</th>
</tr>
</thead>
<tbody>
<tr>
<td>II</td>
<td>total income</td>
<td>(2 marks)</td>
</tr>
<tr>
<td>III</td>
<td>highest expenditure</td>
<td>(2 marks)</td>
</tr>
</tbody>
</table>

18 (a) Subtract 0111, from 1001, 0 mark)
Using two's complement, subtract 7 from 4 and give the answer in decimal notation. (4 marks)

Convert:
(i) \(91_{16}\) to octal (3 marks)

(ii) \(3768_{10}\) to hexadecimal (3 marks)

(iii) \(9.625\) to binary. (4 marks)

Explain what the following DOS commands will do when executed.

(i) \(A:\>\text{copy} \ *.* \ B:\) (2 marks)

(ii) \(C:\>\text{ERASE} \ *.\text{DOC}\) (2 marks)
(b) (i) With the aid of a diagram, explain hierarchical (tree) network topology.

(ii) List two advantages and two disadvantages of hierarchical network topology.

Advantages

Disadvantages
20  (a) Name and explain the function of the keyboard keys represented by the following symbols.

(i)  (2 marks)

(ii)  (2 marks)

(iii)  (2 marks)

(b) Simulation is one of the application areas of computers.

(i) What is meant by the term simulation?  (1 mark)

(ii) Name two application areas of simulation.  (2 marks)

(iii) State three advantages of computer based simulation.  (3 marks)

(c) Explain three ways in which computers have impacted on education.  (3 marks)
THE KENYA NATIONAL EX
Kenya Certificate of Secondary Education
COMPUTER STUDIES
Paper 1 (SAMPLE PAPER)
(THEORY)
2 2\frac{1}{2} hours

This paper consists of two sections; A and B.
Answer all the questions in section A.
Answer question 16 and any other three questions from section B.

For Official Use Only

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<td>20</td>
<td></td>
</tr>
</tbody>
</table>

Total Marks

This paper consists of 5 printed pages

Candidates should check the question paper to ensure that all the pages are printed as indicated and no questions are missing.

SECTION A (40 MARKS)

Answer all the questions in this section.

1. State two practices to be observed in order to ensure the safety of the computer user. (2 marks)

2. Give an example of a:
   (a) device that reads data. (3 Marks)
   (b) pointing device
   (c) voice input device.

3. How does an operating system organise information? (1 Mark)

4. List three factors to be considered when purchasing a micro-computer. (3 Marks)

5. Distinguish between data and information. (2 Marks)

6. (a) State the type of data communication media that could be used in an electronically noisy environment. (1 Mark)

   (b) Explain your answer in (a) above. (1 Mark)

7. Give two reasons why it is necessary to have a program design. (2 Marks)

8. Distinguish between portrait and landscape orientations. (2 Marks)

9. (a) State one use of hexadecimal notation in a computer. (1 Mark)

   (b) Convert 161% to hexadecimal. (2 Marks)

10. Explain two features of a DVD that enables it to store more information than a CD-R. (4 Marks)

   Explain the meaning of the following terms:

   (a) cracking (2 Marks)

   (b) fire walls. (2 Marks)

11. Name three responsibilities that are carried out by a web administrator. (3 Marks)

12. (a) What is meant by the term e-learning? (1 Mark)

   (b) A school intends to set-up an e-learning system. List three problems that are likely to be encountered. (3 Marks)

13. Name three circumstances in which it is better to use a questionnaire than an interview for gathering information. (3 Marks)

451/1
15. A worksheet contains the data shown below:

<table>
<thead>
<tr>
<th>Cell</th>
<th>A1</th>
<th>A2</th>
<th>A3</th>
<th>C1</th>
<th>C2</th>
<th>C3</th>
<th>G1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entry</td>
<td>5</td>
<td>7</td>
<td>10</td>
<td>10</td>
<td>15</td>
<td>15</td>
<td>=SUMIF(C1:C3, &quot;&lt;&gt; 10&quot;, A1:A3)</td>
</tr>
</tbody>
</table>

State the value displayed in G1. (2 Marks)

SECTION B (60 Marks)

Answer question 16 and any other three questions from this section.

16. (a) The following Pseudocode processes data in an array A:

\[
\text{n} = 3
\]

for \( i = 2 \) to \( n \) do

\[
X = A[i]
\]

\[
A[0] = X
\]

\[
j = i - 1
\]

While \( A[j] > X \) do

\[
\]

\[
J = J - 1
\]

End while

\[
A[j + 1] = X
\]


End for

(i) Draw a flowchart for the above pseudocode. (7 Marks)


What is the output of the above pseudocode? (6 Marks)

(iii) What is the purpose of the above pseudocode? (1 Mark)

(b) Give an advantage of using an object oriented programming language. (1 Mark)
17. (a) Study the diagram below and answer the questions that follow:

(i) Name the communication media depicted in the above diagram. (1 Mark)

(ii) Name the parts labelled A, B, C and D. (4 Marks)

(iii) List three advantages of the above communication media. (3 Marks)

(b) A student is attempting to print a programming documentation. The printer is not responding to the print command. Explain four possible causes for the anomaly. (4 Marks)

(c) Describe three mouse clicking techniques. (3 Marks)

18. (a) Despite the introduction of the ATM Card, human resource is still necessary in the banks. Give two reasons why humans are still needed. (2 Marks)

(b) State four advantages to the users of the cards. (4 Marks)

(c) Give two safety precautions that the card owners should observe to ensure security of their money. (4 Marks)

(d) (i) What is virtual reality? (2 Marks)

(ii) List three areas where virtual reality is used? (3 Marks)

19. (a) Distinguish between logical and physical computer files. (2 Marks)

(b) (i) Define the term computer ethics. (1 Mark)

(ii) Give two examples to show how a person who has committed a computer crime can help to improve a computer system. (2 Marks)
What is a search engine? (1 Mark)

The internet can be used to source information about emerging issues that may not be available in print form. Give two advantages and two disadvantages of information obtained from the internet. (4 Marks)

A recent breakthrough in the manufacturing industry is the development of a full manufacturing plant that can produce vehicles using robots only. Despite these advances, some manufacturers prefer to use human labour. Give three advantages and two disadvantages of fully automated manufacturing. (5 Marks)

Give one advantage of using GUI over a Command Line Interface. (1 Mark)

Some computer systems still use command line interfaces. State two advantages of command line interface. (2 Marks)

Distinguish between operating system software and utility software. (2 Marks)

Name two utility programs. (2 Marks)

Outline three precautions one should take when assembling a computer. (3 Marks)

Give three reasons why one might purchase a computer with a one year warranty instead of a three year warranty. (3 Marks)

Distinguish between serial and parallel communication ports of a computer. (2 Marks)
INSTRUCTIONS TO CANDIDATES

Write your name and index number in the spaces provided above.
This paper consists of TWO sections; A and B.
Answer ALL the questions in section A.
Answer question 16 and any other THREE questions from section B.
All answers should be written in the spaces provided on the question paper.
SECTION A (40 marks)

Answer all the questions in this section in the spaces provided.

1. What is meant by:
   (a) analogue data (1 mark)
   (b) digital data? (1 mark)

2. Distinguish between transcription and transposition types of errors and give an example of each. (4 marks)

3. (a) What are peripheral devices? (1 mark)
   (b) Give two examples of peripheral devices. (1 mark)

4. (a) What is meant by the term userfriendly as used in software development? (1 mark)
(b) Distinguish between the terms single-tasking and multi-user as used in operating systems.  

What actions should be taken in case of a fire outbreak in the computer laboratory?  

What is an Internet Service Provider?  

An employee in a business company is charged with the responsibility of putting the company advertisements on the internet.  

(i) State the professional title of the employee.  

(ii) Give an example of software used by this employee to carry out the above task.  

Differentiate between COM ports and LPT ports.
12 (a) List two arithmetic operations that can be performed on a row of numeric data in a word processing table. (1 mark)

(b) In each case of (a) above, write the expression used. (2 marks)

13 List two methods of gathering information during system development process. (2 marks)

14 Name three types of optical disks. (3 marks)

15 The diagram below shows a formatted plate surface of a storage disk.

Shade and label:
(a) one sector (1 mark)
(b) one block (1 mark)
Answer question 16 and any other three questions from this section in the spaces provided.

16  (a) List two examples of:

(i) third generation languages  

(ii) object oriented languages.  

(b) Draw a flowchart to compare three non-equal numeric values A, B, C and print the largest of the three.
One of the functions of an operating system is job scheduling. Explain what is meant by job scheduling. (1 mark)

List and explain three types of user interfaces. (6 marks)

Describe the following categories of software:
(i) firmware (1 mark)

(ii) proprietary software. (1 mark)

A new company XYZ intends to go into the business of desktop publishing. Advise the company on three computer hardware system specification features to consider as a measure of enhancing performance. (6 marks)

Distinguish between the following sets of terms as used in spreadsheets.
(i) Worksheet and workbook. (2 marks)

Turn over
(ii) Filtering and sorting. (2 marks)

(b) State one way in which a user may reverse the last action taken in a spreadsheet package. (1 mark)

(c) The following is a sample of a payroll. The worksheet row and column headings are marked 1, 2, 3,… and A, B, C,… respectively.

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>NAME</td>
<td>HOURS WORKED</td>
<td>PAY PER HOUR</td>
<td>BASIC PAY</td>
<td>ALLOWANCES</td>
<td>GROSS PAY</td>
<td>TAX DEDUCTIONS</td>
<td>NET PAY</td>
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<tr>
<td>2</td>
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<td>12</td>
<td>1500</td>
<td>1800</td>
<td>180</td>
<td>1980</td>
<td>396</td>
<td>1584</td>
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<td>3</td>
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<td>28</td>
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<td>650</td>
<td>65</td>
<td>715</td>
<td>143</td>
<td>572</td>
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<tr>
<td>4</td>
<td>MUTISO</td>
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<td>22.5</td>
<td>500</td>
<td>500</td>
<td>50</td>
<td>550</td>
<td>110</td>
<td>440</td>
</tr>
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<td>8</td>
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<td>180</td>
<td>180</td>
<td>18</td>
<td>198</td>
<td>39</td>
<td>159</td>
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<tr>
<td>10</td>
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<td>33</td>
<td>700</td>
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<td>70</td>
<td>770</td>
<td>154</td>
<td>616</td>
</tr>
<tr>
<td></td>
<td>TOTALS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>6370</td>
<td>1387</td>
<td>5122</td>
</tr>
</tbody>
</table>

Use the following expressions to answer the questions that follow:

- Basic pay = Hours worked x pay per hour
- Allowances are allocated at 10% of basic pay
- Gross pay = Basic pay + allowances
- Tax deductions are calculated at 20% of gross pay
- Net pay = Gross pay - tax deductions.

Write formulae using cell references for the following cells:

(i) D2 (1 mark)
(d)  (i) State three ways of moving round the page in a Desktop Publishing window.  

(ii) State two ways on how Information & Communication Technology (ICT) can be used to reduce the spread of HIV/AIDS.  

19  (a) Describe the following terms with reference to security of data:  

(i) log files  

(ii) firewalls.  

Turn over
(b) A students’ database comprises of students’ details table and fees received table as shown below:

<table>
<thead>
<tr>
<th>Students’ details table</th>
<th>Fees Received table</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surname</td>
<td>Date</td>
</tr>
<tr>
<td>Middle Name</td>
<td>Amount</td>
</tr>
<tr>
<td>First Name</td>
<td>Receipt Number</td>
</tr>
<tr>
<td>Admission Number</td>
<td></td>
</tr>
<tr>
<td>Course</td>
<td></td>
</tr>
</tbody>
</table>

(i) State the primary key field for each table. (2 marks)

(ii) State the field which should serve as the linking field for the two tables. (2 marks)

(c) Describe the following terms with respect to computer security:

(i) logic bombs (2 marks)

(ii) physical security (2 marks)

(iii) tapping. (2 marks)
(d) List three functions of an antivirus software. (3 marks)

20 (a) The diagram below shows four common network topologies A, B, C and D.
(ii) Name the network topologies labelled A, B, C and D. (4 marks)

A

B

C

D

(ii) Explain what happens if server X in topology A fails. (1 mark)

(iii) List two problems associated with network topology B. (2 marks)

(iv) List two disadvantages associated with network topology D. (2 marks)

Differentiate between Internet and World Wide Web. (2 marks)

Describe the following network services and identify their applications.

(i) Voice mail. (2 marks)

(ii) Video conferencing. (2 marks)
Write your name and index number in the spaces provided above.
Sign and write the date of the examination in the spaces provided above.
This paper consists of TWO sections; A and B.
Answer ALL the questions in section A.
Answer question 16 and any other THREE questions from section B.
All answers should be written in the spaces provided on the question paper.

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<th>Candidate's Score</th>
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<tbody>
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</tbody>
</table>

This paper consists of 14 printed pages

Candidates should check the question paper to ascertain that all the pages are printed as indicated and no questions are missing.
SECTION A (40 marks)

Answer ALL the questions in this section in the spaces provided.

Describe the computer booting process. (2 marks)

State the functions of the following keys on the computer keyboard: (2 marks)

(a) backspace

(b) insert (ins).

3 Jane has noticed the following problems in her computer:

• it is taking a longer time to start-up;
• it is often hanging;
• applications are taking longer to load.

State three possible causes of these problems and how they can be solved. (3 marks)
4 (a) Define authenticity as used in software selection. (1 mark)

(b) List four ways of acquiring software in an organization. (2 marks)

5 Some of the storage disks available are: Zip disks, 3-inch floppy disks, DVDs and 5-inch floppy disks. Arrange these devices in an ascending order of storage capacity. (2 marks)

6 You have been asked to change your computer password. State a precaution you need to take in order to avoid each of the following:

(a) forgetting the password (1 mark)

(b) hacking. (1 mark)

7 State four benefits of using a computer in a school library. (2 marks)
8. Using six bits, find the two's complement of -2310.  

9. Explain data series, axis and legend as used in spreadsheet charts:  
   data series,  
   axis  
   legend  

10. (a) Describe the term data integrity.  
    (b) State four situations in which data may lose integrity.  

11. State the function of each of the following:  
    (a) network interface card
(b) network protocol (1 mark)

(c) hub. (1 mark)

12 List four types of publications that can be designed by using desktop publishing software. (2 marks)

13 Differentiate between the following pairs of terms as used in database design: (2 marks)

(a) input mask and design
(b) Table and query. (2 marks)

14 List four factors to be considered when purchasing an operating system. (2 marks)

15 Write an algorithm to compute the area of a triangle. (2 marks)
SECTION B (60 marks)

Answer question 16 and any other THREE questions from this section in the spaces provided.

16  (a) Study the flowchart below and answer the questions that follow.

START

M = 6  
N = 17

P = M - N  
Q = N + M

YES

NO

M = N  
Q = M  
P = N

(i) Name the control structures used in the flowchart. (2 marks)

(ii) Determine the values of M, N, P and Q. (4 marks)

M: .............................................. N: ..............................................

P: .............................................. Q: ..............................................
(iii) Write the pseudocode for the flowchart. (8 marks)
List four functions of an assembler. (2 marks)

Define the following web related terms:

(i) web browser (1 mark)

(ii) hyperlink (1 mark)

(iii) hyper text document. (1 mark)

List six activities performed on the web. (3 marks)

An institution has ten stand-alone computers.

(i) Suggest with reasons the most appropriate topology required to inter-connect the computers. (3 marks)

Turn over
(ii) State the necessary steps required to connect the computers to the internet.

(4 marks)

(d) Below is an e-mail address:

   ggitau @moest.edu.ke

   (i) (ii) (iv) Name the parts labelled:  (2 marks)

   (i) ....................................

   (ii) ....................................

   (iv) ....................................

   (Hi) ....................................

18 A computer C directory has folders for Form 1, Form 2, Form 3 and Form 4. Each class has student's folders labelled according to their admission number. The students create their own folder for the subject they are studying based on the table shown below.

<table>
<thead>
<tr>
<th>Form 1</th>
<th>Form 2</th>
<th>Form 3</th>
<th>Form 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>OS</td>
<td>SP</td>
<td>Prog.</td>
<td>ADB</td>
</tr>
<tr>
<td>WP</td>
<td>DTP</td>
<td>Internet</td>
<td></td>
</tr>
<tr>
<td></td>
<td>DB</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
(i) A form four student wants to create a folder to store her project. State the path for that project folder.  

(2 marks)

(ii) Suggest how the student can ensure that:

work is not lost in case the hard disk fails;  

the project is not copied by other students.  

(1 mark)

(i) Other than I/O devices, list other three devices under the control of the operating system.  

(3 marks)

(ii) Explain any one of the devices named in (c)(i) above.  

(1 mark)
A manager wishes to replace the current manual system with a computerised one.

(a) Describe three main areas that must be evaluated to justify the replacement. (6 marks)

(b) List the three areas that would be considered in the requirements specifications. (3 marks)

(c) State and explain three ways that can be followed to replace the current system. (6 marks)

(d) Define the term trouble shooting. (1 mark)
(a) A headteacher keeps the following student details in a database: Name, Address, Town, Date of birth, Marks scored, Fees paid.

(i) Name the most appropriate primary key. Give a reason. (2 marks)

(ii) For each item in the student's details above, indicate its most appropriate datatype as used in the database. (3 marks)

(iii) Explain why input screens are better data entry designs than entering data directly to a table. (2 marks)

(b) List two career opportunities associated with databases. (2 marks)

(c) Distinguish between:

(i) a table in word-processing application and a table in a database application (2 marks)
(ii) mouse pointer and insertion point.  

(d) Outline the steps to be followed in order to merge cells in a word processing table.  

Instructions to candidates
Write your name and index number in the spaces provided above.
Sign and write the date of the examination in the spaces provided above.
This paper consists of two sections; A and B.
Answer all the questions in section A.
Answer question 16 and any other three questions from section B.
All answers should be written in the spaces provided on the question paper.

For Examiner's Use Only

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<tr>
<td>A</td>
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<td>B</td>
<td>16</td>
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<td>18</td>
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<td>Total Score</td>
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<td></td>
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</tbody>
</table>

This paper consists of 15 printed pages.

Candidates should check the question paper to ascertain that all the pages are printed as indicated and no questions are missing.
SECTION A (40 marks)

Answer all the questions in this section in the spaces provided.

1. (a) Describe an input device. (1 mark)

   (b) Other than scanning devices, name two other input devices. (1 mark)

2. Distinguish between the following:

   (a) CRT and LCD (2 marks)

   (b) OCR and OMR. (2 marks)
3. (a) What is meant by freeware? (1 mark)

(b) State two ways of acquiring freeware. (1 mark)

4. Describe the term 'home page' as applied in the internet. (2 marks)

5. (a) Define the term Computer Aided Design. (1 mark)

(b) List three advantages of using Computer Aided Design. (3 marks)
6. List three ways in which computer technology can be used in law enforcement. (3 marks)

7. A computer system is able to work on both spreadsheet and wordprocessing documents. Explain how a computer can operate two packages at the same time. (2 marks)

8. Describe each of the following types of computers (2 marks)
   (a) hybrid;
   (b) embedded.

9. State two purposes of the maintenance phase of the system development life cycle. (2 marks)
10.  (a) List four stages in data collection.  

(2 marks)

(b) What is meant by the following:  

(i) transaction file;  

(ii) master file?

(2 marks)

11. Headache, back and neck pain may result from use of computers. State how each of them can be minimised.  

(2 marks)

12. State two ways in which each of the following can be prevented:  

(a) software errors;  

(b) computer fraud.
13. In relation to DTP, state the:
   (a) purpose of frames; (1 mark)
   (b) difference between an inside margin and an outside margin. (2 marks)

14. Distinguish between formatting a disk and scanning a disk with reference to operating systems. (2 marks)

15. State two advantages of using robots in manufacturing of goods. (2 marks)
SECTION B (60 marks)

Answer question 16 and any other three questions from this section in the spaces provided.

16. 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:
(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  (2 marks)

(ii) 99  (2 marks)
(iii) 120   

(iv) 5   

(b) Explain the purpose of this flowchart.   

(c) Write a pseudocode for the above flowchart.   

17. (a) Describe two ways in which a computer can represent a positive number and a negative number.   

17. (a) Describe two ways in which a computer can represent a positive number and a negative number.   

8357
(b) A particular computer stores numbers in a single 8-bit word. How would it represent $0.3125_{10}$? (3 marks)

(c) What is the decimal equivalent of the number $1.0112_2$? (2 marks)

(d) Perform the decimal subtraction $14_{10} - 6_{10}$ using
   (i) regular binary; (3 marks)
   (ii) one's complement. (5 marks)
18. (a) List three advantages and three disadvantages of wired communication over wireless communication. (6 marks)

Advantages

Disadvantages

(b) Describe the following signals and state where each is applied in network communication: (4 marks)

(i) analog;

(ii) digital.

(c) Name the two types of coaxial cables. (2 marks)

(d) (i) Define the term network protocol. (1 mark)
19. The information below is maintained by the patron of wildlife club in a school. Study it and answer the questions that follow.

<table>
<thead>
<tr>
<th>Name</th>
<th>Class</th>
<th>Admission Number</th>
<th>Membership Number</th>
<th>Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mary</td>
<td>4E</td>
<td>3740</td>
<td>S 001</td>
<td>Serengeti</td>
</tr>
<tr>
<td>Gupta</td>
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<td>T001</td>
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<td>A 001</td>
<td>Amboseli</td>
</tr>
<tr>
<td>Mariam</td>
<td>2E</td>
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<td>Serengeti</td>
</tr>
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<td>2W</td>
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<td>Nairobi</td>
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<td>3746</td>
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<td>N002</td>
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<tr>
<td>Paul</td>
<td>1N</td>
<td>4013</td>
<td>M002</td>
<td>Mara</td>
</tr>
</tbody>
</table>

(a) Describe the field values, records and file. (3 marks)

(b) State the most appropriate primary key for the list. (1 mark)

(c) State the most appropriate data type for the fields:

(i) admission number; (1 mark)

(ii) membership number. (1 mark)
(d) If a database was to be created for the list: Forms, Tables, Queries and Reports are likely to be used.

(i) How many field values are in the list? (1 mark)

(ii) How many records are in the list? (1 mark)

(ii) Which objects cannot be used to store the data in the list? (3 marks)
An operating system organises files in directories as shown in the chart below. Study it and answer the questions that follow.

(a) (i) What is the name of this file structure?  

(ii) One of the files in MISCELLANEOUS has a file name similar to one in CHEMISTRY in Form 1. Describe what happens if all the contents of CHEMISTRY are copied to MISCELLANEOUS.  

(iii) What will happen if an attempt is made to delete FORM2 while File1O in MATHEMATICS is open?  

Turn over
(iv) State four advantages of this structure. (2 marks)

State four properties that an operating system displays about a file. (2 marks)

A removable storage media unit connected to a single user microcomputer system is used for permanent storage of programs and data. State six file functions you would expect the operating system of the computer to provide to enable the user to maintain this storage media. (3 marks)

State two tasks performed by the operating system in each of the following resources:

(i) memory; (2 marks)
(ii) input/output devices. (2 marks)
THE KENYA NATIONAL EXAMINATIONS COUNCIL
Kenya Certificate of Secondary Education
COMPUTER STUDIES Paper
1 (THEORY)
2½ hours

Instructions to Candidates

(a) Write your name and index number in the spaces provided at the top of this page.
(b) Sign and write the date of examination in the spaces provided above.
(c) This paper consists of TWO sections; A and B.
(d) Answer ALL the questions in section A.
(e) Answer question 16 and any other THREE questions from section B.
(f) All answers should be written in the spaces provided on the question paper.
(g) This paper consists of 16 printed pages.
(h) Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.

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Certificate of Secondary Education COMPUTER STUDIES Paper 1
(THEORY)
SECTION A (40 marks) Answer ALL the questions in this section in the spaces provided. Give a reason for each of the following: (a) changing a password regularly; (1 mark)

(b) typing and re-typing a new password when changing it. (1 mark)

With reference to quality of print, noise level and cost, compare a dot matrix with a Laser printer.

A computer accessories vendor needs to order supplies. A spreadsheet is used to calculate the order part of which is shown below.

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Item</td>
<td>Price per unit</td>
<td>Number ordered</td>
<td>Cost (Kshs)</td>
</tr>
<tr>
<td>2.</td>
<td>56K modem</td>
<td>8,565.00</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>128 MB Ram</td>
<td>4,950.00</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Pentium IV Processor</td>
<td>13,525.00</td>
<td>55</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td></td>
<td>Total</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(a) Write the formula that can be used in:
(i) D2

(ii) D5

(b) If a value added tax (VAT) of 16% was charged on each item and the number ordered was decreased by 10%, write a new formula that can be used in D2.

(2 marks)

4 List two uses of computers in meteorology. (2 marks)

5 Explain the following terms as used in desktop publishing: (2 marks)

(a) embedded object

(b) autoflow.
(a) Name **four** approaches that may be used to replace a Computerised Information system. (2 marks)

(b) Which of the approaches named in (a) above is appropriate for critical systems? Explain. (2 marks)

7 Explain the following operating system functions:

(a) job scheduling; (1 mark)

(b) interrupt handling. (1 mark)
8. Name four toggle keys on a standard computer keyboard.  

9. A computer user typed the name Kajiado as Kajaido and 8726 as 8126. (a)

State the type of each error.  

(b) Explain how such errors can be controlled.  

10. Describe Third Generation Languages and name two examples.
11 (a) (i) What is an internet protocol (IP) address? (1 mark)

(ii) Why is an IP address necessary? (1 mark)

(b) What is the purpose of the following internet domains? (i) .org (1 mark)

(ii) .gov

12 (a) Name two types of buses found on the computer motherboard. (2 marks)

(b) State the purpose of each of the types of buses named in (a) above. (2 marks)

13 (a) Name the two files commonly used in mail merge. (1 mark)
(b) Name and explain the **two** types of dropcaps. (2 marks)

Give **three** ways in which horticultural farmers can benefit from the use of Information and Communication Technology (ICT). (3 marks)

Arrange the following job titles in the order of their seniority.

Database administrator, ICT manager, Systems analyst. (1 mark)
16 Study the flowchart below and answer the questions that follow.

(a) What would the flowchart generate as output if the value of N at input was:

(i) 6?

(ii) 1?

Write a pseudocode that does the same thing as the flowchart above.
(c) Modify the flowchart so as to reject an input below 0 and to avoid the looping when the input is 0. (4 marks)

A lecturer keeps the following student details in a database: name, age, course.

(a) Write an expression you would use to compute the year of birth of a student using this year as the current year. (2 marks)
(b) What query expressions would the lecturer use to list the students whose age is above 15 years and below 25 years? (3 marks)

(c) Which expression would the lecturer use to generate: (i) the number of students in the database? (2 marks)

(ii) the mean age of the students in the database? (2 marks)

(d) Name and describe any two types of database models. (6 marks)
The diagram below shows a layout of a computer network used by a law firm. A workstation and a printer are located in every consulting room.

(i) Name the network topology depicted in the diagram. (1 mark)

(ii) Name the device labelled D. (1 mark)

(iii) State four functions of the device labelled 'server' (4 marks)
Give **two** advantages and **one** disadvantage of the above network design.

(3 marks)

(v) If the firm intends to open extra offices in two different towns, name any **three** hardware devices that would be required. (3 marks)

(vi) State any **two** security problems that might arise by linking the offices in different towns. (2 marks)

What is spy ware? (1 mark)
19 (a) Study the following diagram and answer the questions that follow.

From the diagram:

(i) Name **two** devices that are used for long term storage.  
(2 marks)

(ii) Name **three** peripherals shown on the diagram that are used for input.  
(3 marks)

(iii) Name **two** other devices that a Computer Aided Design (CAD) user might wish to add to the set-up above. 
(2 marks)

A customer wishes to purchase a computer system. The customer can buy word processor, spreadsheet, database and a drawing package separately or as an integrated
package. State three advantages why many computer users prefer integrated packages to separate packages. (3 marks)

(i) An anti-virus software installed in a computer is loaded into the main memory each time the computer is switched on.
 Explain three ways in which computer viruses are spread from one computer to another. (3 marks)

(ii) Give two reasons why an anti-virus package should be updated regularly. (2 marks)

Perform the following binary arithmetic and give your answers in decimal notation:

(i) 1010.101 + 11.011 (3 marks)

(ii) 1010.011 - 11.011 (3 marks)
Covert the following numbers into their binary equivalents:

(i) \( 0.5625 \)  
   \( 1 \) 0 \( \)  \( 3 \) marks

(ii) \( 0.3125 \)  
    \( 1 \) 0 \( \)  \( 3 \) marks

Using four-bit twos compliment, perform the following arithmetic
(3 marks)
\[ 101_2 - 111_2 \]
Instructions to Candidates

(a) Write your name and index number in the spaces provided above.
(b) Sign and write the date of examination in the spaces provided above.
(c) This paper consists of TWO sections; A and B.
(d) Answer ALL the questions in section A.
(e) Answer question 16 and any other THREE questions from Section B.
(f) ALL answers should be written in the spaces provided on the question paper.
(g) Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.

For Examiner's Use Only

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<th>Questions</th>
<th>Candidate's Score</th>
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<td>B</td>
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Kenya Certificate of Secondary Education
COMPUTER STUDIES
Paper 1
THEORY
SECTION A (40 marks)

Answer all the questions in this section in the spaces provided.

* JJ(sl four activities carried out by a data processing system. (2 marks)

(a) Define data communication. (1 mark)

(b) State two characteristics of an effective data communication system. (2 marks)

Explain why an intranet is a more secure way to share files within an organisation compared to the internet. (2 marks)

“sen a formal, and a function as used in spreadsheets. (2 marks)
5 State four functions which are specific to Network Operating Systems (4 marks)

6 The word raejjs appearing several times in a long story document composed using a DTP package. How would this word be replaced with the word content?. (3 marks)

Study the pseudocode below and determine its output. (3 marks)

1. while 0 0 1
2. M + T
3. T + 5
4. K + 1
5. Repeat step 2 while K < 3
6. Write M, T
7. Exit
8 Give **two** reasons why the use of fingerprints and voice input can be used as reliable forms of security in computer systems. (2 marks)

9 State the purpose of each of the following memories in a computer system. (2 marks)
   (a) RAM
   (b) Hard disk

10 Explain why telecommuting is just suitable for a doctor when carrying out an operation on a patient. (2 marks)

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. (2 marks)
12 State two reasons why it is necessary to use standard furniture in a computer laboratory.

13 Describe the following terms as used in mail merging:
   (a) main document;
   (b) data source.

14 State three ways in which ICT can be used in shipping control.

15 A firm operates an order system that coordinates orders, raw materials and inventory across its three factories. Currently the orders are processed manually at each factory and communicated to the others over the phone. The management intends to computerise their operations. State the first two computer professionals who will be required and their roles.
SECTION B (60 marks)

Answer question 16 and any other three questions from this section in the spaces provided.

(a) Machine language programs are more difficult to write than high-level language programs. State two reasons for this. (2 marks)

(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:

<table>
<thead>
<tr>
<th>Score</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>80 &lt; score</td>
<td>A</td>
</tr>
<tr>
<td>60 &lt; score &lt; 80</td>
<td>B</td>
</tr>
<tr>
<td>40 &lt; score &lt; 60</td>
<td>C</td>
</tr>
<tr>
<td>score &lt; 40</td>
<td>F</td>
</tr>
</tbody>
</table>

• Display the student's name, index number, average score and the grade.
• Repeat the above steps for all the students in the class. (10 marks)
(c) Below is a list of program segments in different generations of programming languages. Identify the language for each. (3 marks)

(i) LDA 105
    SUB 40
    ADD 20

(ii) 10000110 10111101
     01111000 0001100

(iii) For x: = 1 to 10 do
       Write (x);
17 (a) The following are some of the phases in the systems development life cycle (SDLC): system analysis, system design, system implementation, system review and maintenance. State four activities that are carried out during the system implementation phase. (4 marks)

(b) Give three reasons why system maintenance phase is necessary in SDLC. (3 marks)

(c) State two instances where observation is not a viable method of gathering information during system analysis stage. (2 marks)

(d) Various considerations should be made during input design and output design. State two considerations for each case. (4 marks)

Input design.

Output design.
(e) State **two** reasons why an organisation may use other strategies of software acquisition other than developing their own. (2 marks)

18 (a) Using **two** examples, explain the term field properties as used in database design. (2 marks)

(b) Below is an extract from a hospital database table.

<table>
<thead>
<tr>
<th>Patient No</th>
<th>Name</th>
<th>Date Registered</th>
<th>Amount paid</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>LDK/001</td>
<td>Mathew Olang</td>
<td>04/05/08</td>
<td>2500.00</td>
<td>To go for x-ray</td>
</tr>
<tr>
<td>LDK/004</td>
<td>Joy Chelimo</td>
<td>07/06/08</td>
<td>1200.00</td>
<td>Medicine to be ordered</td>
</tr>
<tr>
<td>LDK7008</td>
<td>John Kamau</td>
<td>09/08/08</td>
<td>3500.00</td>
<td>To be admitted for further check up</td>
</tr>
<tr>
<td>LDK/002</td>
<td>Gerald Wasike</td>
<td>02/04/05</td>
<td>800.00</td>
<td>To come back for review</td>
</tr>
</tbody>
</table>

(i) State with reasons the most suitable data types for the following fields: (8 marks)

(I) patient No;

(II) date registered;

(III) amount paid;
(IV) remarks.

(ii) Which would be the most appropriate primary key field for the above table? (1 mark)

(iii) What is the purpose of a primary key field in database design? (1 mark)

(iv) Describe how information about patients who registered after 09/08/06 can be extracted from the database. (3 marks)

19 (a) Explain how data in a computer system is secured using: (4 marks)

(i) password;

(ii) user access level.
(b) State three characteristics of a suitable password. (3 marks)

(c) State two characteristics of a computer that is infected by computer viruses. (2 marks)

(d) (i) The figure below shows how data is transmitted through a public telephone line.

Name A, B, C and D. (4 marks)

(ii) State two advantages of using fibre optic cables over satellite in data communication. (2 marks)
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. 

\[ (+54) - (+29) \] 

THIS IS THE LAST PRINTED PAGE.
Instructions to Candidates

1. Write your name and index number in the spaces provided above.
2. Sign and write the date of examination in the spaces provided above.
3. This paper consists of TWO sections: A and B.
4. Answer ALL the questions in section A.
5. Answer question 16 and any other THREE questions from Section B.
6. ALL answers should be written in the spaces provided on the question paper.
7. This paper consists of 13 printed pages.
8. Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.

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<td>20</td>
<td></td>
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<tr>
<td>B</td>
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<td></td>
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<tr>
<td>Total Score</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
SECTION A (40 marks)

Answer all the questions in this section in the spaces provided.

1. The text in the box below was composed using a wordprocessor. The current cursor position is between the words “is” and “an”.

   Computer security is an increasingly important consideration. From authentication....

   Describe what happens to the text in the box above when each of the following keyboard keys are pressed.

   (3 marks)

   (a) tab

   (b) enter

   (c) home

2. State four characteristics which make computers better than human beings. (4 marks)

   ____________________________

   ____________________________

   ____________________________

   ____________________________

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2011 (MMXI) KCSE (11462)

COMPUTER STUDIES

Paper 1
3 Give three reasons why primary storage devices are not used for secondary storage. (3 marks)

4 Asha has a hardware shop and lately, she is finding the task of managing daily sales in the shop overwhelming.

(a) State a retail system that she should acquire. (1 mark)

(b) State two input devices that are used in retail systems. (1 mark)

(c) Apart from enhancing the speed of operation, state two other benefits that Asha will gain from using such a system. (2 marks)

5 The accounts department of a secondary school is using a system that generates invoices that are printed in triplicate using carbon papers.

(a) Name one type of printer suitable for this task. (1 mark)

(b) Give a reason for your answer in (a) above (1 marks)
A secretary saved a document in a computer. After some time, she could not remember the name and the location of the file. State **four** file details that are assigned a file by the operating system which can assist in tracing the file.

(2 marks)

A student tried opening an application program on a computer that was functioning well. The program did not load and the operating system reported that the memory was insufficient. Give **two** causes of such response.

(2 marks)

State **two** measures that can be put in place to control piracy of software.

(2 marks)

Identify **three** hardware considerations to be made before installing an operating system.

(3 marks)
10 A water company sends out clerks to read water meters. The data collected by the clerks is then fed into the computer and then all the bills are printed at the same time.

(a) State two advantages of this approach. (2 marks)

(b) Name this type of data processing. (1 mark)

11 A school has acquired a system that imitates human teachers. Students can learn by getting answers from the system which they would normally get from the teacher. Give three advantages of this system. (3 marks)

12 Pesa Mingi company has offices in Nairobi and Kampala connected in a network. The management is convinced that someone is illegally gaining access to the data in their computers. State three ways in which the company can overcome this problem. (3 marks)

13 State the purpose of each of the following in database design.

(a) input mask (1 mark)

(b) default value (1 mark)
14 State the importance of considering the following factors when acquiring a software.

(a) warranty; 

(b) portability. 

15 State two application areas of real time systems. 

SECTION B (60 marks)

Answer question 16 and any other three questions from this section in the spaces provided.

16 (a) Give two characteristics of scripting languages. 

(b) Describe two types of errors that may be detected during program testing. 

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2011 (MMXI) KCSE (11462)
COMPUTER STUDIES
Paper I
(c) A company’s workers travel to work either by public or by private means. All workers are paid a travel allowance of Ksh. 200, but those using private means are paid an additional Ksh. 100.

(i) Write a pseudocode to determine a worker’s travel allowance. (3 marks)

(ii) Draw a flowchart to determine a worker’s travel allowance. (4 marks)
(iii) Other than occupying large space, state two disadvantages of using a flowchart instead of a pseudocode. (2 marks)

(a) State three standard data coding schemes used in computing and electronic systems. (3 marks)

(b) Convert each of the following numbers:

(i) \( 110.101_2 \) to decimal; (3 marks)

(ii) \( 12.6875_{10} \) to binary; (4 marks)

(c) Subtract \( 110.01_2 \) from \( 11001.0101_2 \). (2 marks)
(d) Using two's complement, perform the following binary arithmetic leaving the answer in binary notation.

\[ 1101_2 - 100101_2 \]  

(3 marks)

18

(a) What is meant by each of the following terms as used in table creation?

(i) cell margin;  

(1 mark)

(ii) nested table.  

(1 mark)

(b) State four types of text wrap that can be applied to a graphic.  

(2 marks)

(c) Distinguish between each of the following:

(i) axis labels and data labels;  

(2 marks)
(ii) cropping and sizing. (2 marks)

(d) Figure 1 shows a section of a worksheet containing information on household items. Use it to answer the questions that follow.

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ITEM DESCRIPTION</strong></td>
<td><strong>NO OF UNITS</strong></td>
<td><strong>COST PER UNIT</strong></td>
<td><strong>TOTAL COST</strong></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Wheat flour</td>
<td>12</td>
<td>110</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Rice</td>
<td>6</td>
<td>145</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Sugar</td>
<td>7</td>
<td>140</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Salt</td>
<td>2</td>
<td>20</td>
<td></td>
</tr>
</tbody>
</table>

Figure 1

(i) Write a formula to calculate the total cost of rice. (1 mark)

(ii) The prices of all items increased by 10% and the value 10% is placed in cell B8. Using cell addresses with absolute referencing only, write a formula to calculate the new unit price of salt. (2 marks)

(iii) Write a function to display the number of cells in which the cost per unit is equal to 110. (2 marks)

(iv) Write a function to display the least total cost for all items. (2 marks)
19 (a) What is meant by each of the following terms as used in the internet?

(i) surf; (1 mark)

(ii) uploading; (1 mark)

(iii) inbox. (1 mark)

(b) A school has set up its network using wireless technology to link computers. State three problems that the school is likely to experience when using this technology. (3 marks)

(c) List three ways by which parents can protect their children from accessing inappropriate content from the internet. (3 marks)
(d) Explain three problems associated with using e-mail technology for communication. (6 marks)

_____________________________________________________________________________

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20 (a) Explain three reasons why an organization may need to change to a new computerised system. (6 marks)

_____________________________________________________________________________

_____________________________________________________________________________

_____________________________________________________________________________

_____________________________________________________________________________

_____________________________________________________________________________

_____________________________________________________________________________

(b) State why each of the following is important in system documentation.

(i) sample data; (1 mark)

_____________________________________________________________________________

(ii) output reports. (1 mark)

_____________________________________________________________________________
(c) Name the tools used for data storage in each of the following methods of data processing.

(i) manual; .................................................. (1 mark)

(ii) electronic. .................................................. (1 mark)

(d) A teacher manages students’ records by storing daily attendance information in a file called register and students’ personal records such as year of birth and home address in a file called students.

(i) Identify the types of computer files named above. .................................................. (2 marks)

(ii) Give a characteristic of data held in each file. .................................................. (2 marks)

(iii) Name the field that should be used to link the two files. .................................................. (1 mark)
THE KENYA NATIONAL EXAMINATIONS COUNCIL
Kenya Certificate of Secondary Education
COMPUTER STUDIES
Paper 1
(THEORY)
Oct./Nov. 2012
2½ hours

Instructions to candidates

(a) Write your name and index number in the spaces provided at the top of this page.
(b) Sign and write the date of examination in the spaces provided above.
(c) This paper consists of TWO sections, A and B.
(d) Answer ALL the questions in section A.
(e) Answer question 16 and any other THREE questions from section B.
(f) All answers should be written in the spaces provided on the question paper.
(g) This paper consists of 18 printed pages.
(h) Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.

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COMPUTER STUDIES
Paper 1
2
SECTION A (40 marks)

Answer ALL the questions in the spaces provided.

1. State two functions of the Control unit of a computer. (2 marks)

2. (a) Differentiate between hardware and software portability. (2 marks)

   (b) State two disadvantages of CD-ROM over magnetic disks. (2 marks)
One way in which an organisation enforces security of its computer systems is by restricting the use of removable media such as floppy disks and flash memories. Give two reasons for this.

(2 marks)

4

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

(b) List six examples of Data Communication Equipment. (3 marks)
5 When purchasing a computer, the clock speed, RAM size, Hard disk size and monitor size are often quoted. State the unit for measuring: (2 marks)

(a) Clock speed; .................................................................
(b) RAM size; .................................................................
(c) Hard disk size; ...............................................................
(d) Monitor size .................................................................

6 Name three types of graphics used in a word processor. (3 marks)

........................................................................
........................................................................
........................................................................

7 A student saved a document in a diskette. Later on the student found that the diskette could not open and therefore the work got lost. Give three precautions the student should have taken to ensure the work was not lost. (3 marks)

........................................................................
........................................................................
........................................................................
Differentiate between relative cell referencing and absolute cell referencing. (2 marks)

State two:
(a) functions of an email software; (1 mark)
(b) protocols used in sending and receiving of emails. (1 mark)

With reference to word processing, describe the term:
(a) superscript; (1 mark)
(b) section breaks. (1 mark)
11 Describe the following types of relationships as used in Database design: (4 marks)

(a) One-to-one;
(b) One-to-many.

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)
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: ................................................................

State two roles of a programmer in system development life cycle. (2 marks)

................................................................................

................................................................................
15 (a) What is meant by disk defragmentation? (1 mark)

(b) State the purpose of disk defragmentation. (1 mark)
SECTION B (60 marks)

Answer question 16 and any other THREE questions from this section in the spaces provided.

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

(i) 

(ii) 

(iii) 

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COMPUTER STUDIES
Paper 1

912113 Turn over
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;  
(ii) 10.
17 (a) Convert each of the following binary numbers to decimal equivalent given that the left most digit is a sign bit.

(i) 0 0 1 0 1 0 1 

(2 marks)

(ii) 1 1 0 0 1 0 0 1 

(2 marks)
(b) Convert the decimal number 0.42 to 6 bit binary notation. (4 marks)

(c) Using two's complement, subtract 11\(_{10}\) from 8\(_{10}\), leaving your answer in binary notation. (5 marks)

(d) Perform the following binary operation. (2 marks)

\[ 11001 + 1101 - 101 \]
18 (a) State **three** techniques used by a network administrator to detect and prevent computer crimes. (3 marks)

(b) A company in town wishes to link its offices together. The linking may be through wireless or fibre optic network media.

(i) State **two** benefits that the company would gain from the use of metropolitan area network (MAN). (2 marks)

(ii) State **three** advantages of using wireless over fibre optic network media. (3 marks)

(iii) State **two** limitations of wireless communication. (2 marks)

(iv) State **two** transmission media used in wireless transmission. (2 marks)
14
(c) State **three** ways in which computer virus infection can be prevented other than through restricting the usage of removable storage media. (3 marks)

19
(a) (i) What is an information system? (1 mark)

(ii) State **two** roles of an information system. (2 marks)

(b) Describe the following file organisation methods:
   (i) **random** file organisation; (2 marks)

   (ii) **sequential** file organisation. (2 marks)
The following records were extracted from two files that contained student data.

**File A:**

<table>
<thead>
<tr>
<th>Reg. No.</th>
<th>Student Name</th>
<th>Sex</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>3002</td>
<td>Christine Onyancha</td>
<td>F</td>
<td>Box 8932 Kisii</td>
</tr>
<tr>
<td>3008</td>
<td>John Otieno</td>
<td>M</td>
<td>Box 7222 Nairobi</td>
</tr>
<tr>
<td>3001</td>
<td>Amina Muthee</td>
<td>F</td>
<td>Box 1243 Butere</td>
</tr>
<tr>
<td>3015</td>
<td>Peter Musyoki</td>
<td>M</td>
<td>Box 6621 Nyeri</td>
</tr>
</tbody>
</table>

**File B:**

<table>
<thead>
<tr>
<th>Reg. No.</th>
<th>Fees Payments</th>
<th>Date of Payment</th>
</tr>
</thead>
<tbody>
<tr>
<td>3002</td>
<td>1000</td>
<td>04/05/2011</td>
</tr>
<tr>
<td>3008</td>
<td>1500</td>
<td>07/09/2011</td>
</tr>
<tr>
<td>3001</td>
<td>900</td>
<td>02/09/2011</td>
</tr>
<tr>
<td>3015</td>
<td>400</td>
<td>21/09/2011</td>
</tr>
</tbody>
</table>

(i) Which of the two files above represents a Transaction file? (1 mark)

(ii) Give a reason for your answer in c(i) above. (1 mark)

(iii) Name the other type of file represented above. (1 mark)
(d) An airline uses an information system whereby if a passenger at station A books a plane seat, this transaction is immediately shown at stations A and B such that no other passenger can book the same seat.

(i) Identify this data processing mode. (1 mark)

(ii) State two advantages and two disadvantages of this data processing mode. (4 marks)
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)
Instructions to candidates

(a) Write your name and index number in the spaces provided above.
(b) Sign and write the date of the examination in the spaces provided above.
(c) This paper consists of two sections; A and B.
(d) Answer all the questions in section A.
(e) Answer question 16 and any other three questions from section B.
(f) All answers should be written in the spaces provided on the question paper.
(g) This paper consists of 16 printed pages.
(h) Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.
(i) Candidates should answer the questions in English.

For Examiner's Use Only

<table>
<thead>
<tr>
<th>Section</th>
<th>Question number</th>
<th>Candidate's Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1 - 15</td>
<td></td>
</tr>
<tr>
<td></td>
<td>16</td>
<td></td>
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<td></td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>18</td>
<td></td>
</tr>
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<td>19</td>
<td></td>
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<tr>
<td></td>
<td>20</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total Score</td>
<td></td>
</tr>
</tbody>
</table>

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SECTION A (40 marks)

Answer all the questions in this section in the spaces provided.

1 Write each of the following acronyms in full as used in computing. (2 marks)
   (a) CAD
   (b) DVD
   (c) WORM
   (d) POS

2 A school keeps student records in a database. The data is coded before entry. State three reasons why the coding is necessary. (3 marks)

3 Differentiate between Bcc and cc in an email. (2 marks)
4 State **three** risks posed by improper cabling in a computer laboratory. (3 marks)

5 List **two** career opportunities directly associated with computer networking. (2 marks)

6 A retailer uses a spreadsheet program to calculate profits. **Figure 1** shows the spreadsheet.

<table>
<thead>
<tr>
<th>Items</th>
<th>Cost Price</th>
<th>Selling Price</th>
<th>Profit per Item</th>
<th>Items sold</th>
<th>Total Profit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item 1</td>
<td>305</td>
<td>350</td>
<td>45</td>
<td>32</td>
<td>1440</td>
</tr>
<tr>
<td>Item 2</td>
<td>100</td>
<td>120</td>
<td>20</td>
<td>45</td>
<td>900</td>
</tr>
<tr>
<td>Item 3</td>
<td>200</td>
<td>220</td>
<td>22</td>
<td>32</td>
<td>640</td>
</tr>
<tr>
<td>Item 4</td>
<td>107</td>
<td>130</td>
<td>23</td>
<td>89</td>
<td>2047</td>
</tr>
</tbody>
</table>

**Figure 1**

(a) Which row contains labels only? (1 mark)

(b) Write the formula that has been entered in cell F2. (2 marks)
7 State **three** reasons why an organisation may opt to develop its own software in-house rather than buy off-the-shelf software. (3 marks)

8 The topology below is formed by combining two types of topologies.

![Figure 2](image)

(a) Give **one** name for the combined topology in **figure 2**. (1 mark)

(b) Name the **two** topologies forming the combined topology in **figure 2**. (2 marks)
9 An organisation intends to replace an existing system by carrying out the process in stages.

(a) Name this implementation strategy. (1 mark)

(b) Give two reasons why the organisation is opting to use the implementation strategy in (a) above. (2 marks)

10 (a) Explain the importance of disk partitioning. (2 marks)

(b) Differentiate between pull-down menu and pop-up menu as used in Graphical User Interface (GUI) operating systems. (2 marks)

11 The 21st century has had many forms of ICT technologies improving the various means of communication. However, these changes have brought many challenges.

State three negative social impacts of these technologies. (3 marks)
12 Explain why a DTP application would be preferred to a word processing application when designing a publication. (2 marks)

13 A computer is idle but the hard disk light is blinking, indicating some activity. State two possible causes of this. (2 marks)

14 Describe compatibility as a factor to consider when purchasing a computer. (2 marks)

15 Identify the appropriate output device for the production of each of the following:
   (a) receipts where carbon copies are required; (1 mark)
   (b) an architectural drawing where precision is required; (1 mark)
   (c) output where the user is visually impaired. (1 mark)
Answer question 16 and any other THREE questions from this section in the spaces provided.

16 (a) Figure 3 shows a flowchart. Use it to answer the questions that follow.

(i) Determine the output from the flowchart if:
1. \( X = 5; \) (2 marks)
II. \[ X = 7. \] (2 marks)

(ii) Write a Pseudocode for the flowchart in figure 3. (5 marks)
(iii) Modify the flowchart so that it can be used to get the sum of integers between 50 and 100. (4 marks)

(b) List two programming language translators. (2 marks)
(a) Describe three types of validation checks as used in data processing. 

(b) A company has opted to store its employees' personal details in a computer system. Describe two software methods that may be used to prevent unauthorized access to these details.

(c) (i) Describe each of the following data processing modes:
I. real-time;
II. interactive. (2 marks)

(ii) State an application area where real-time data processing mode is applied. (1 mark)

Figure 4 shows an advert placed in a newspaper. Use it to answer the questions that follow.

<table>
<thead>
<tr>
<th>NEW ARRIVALS - LAPTOP COMPUTER</th>
</tr>
</thead>
<tbody>
<tr>
<td>HDD</td>
</tr>
<tr>
<td>300 GB</td>
</tr>
<tr>
<td>RAM</td>
</tr>
<tr>
<td>512 MB</td>
</tr>
<tr>
<td>Clock Speed</td>
</tr>
<tr>
<td>2.3 GHz x 2</td>
</tr>
<tr>
<td>Optical Drive</td>
</tr>
<tr>
<td>DVD</td>
</tr>
<tr>
<td>Screen</td>
</tr>
<tr>
<td>17 inches</td>
</tr>
<tr>
<td>Other Ports</td>
</tr>
</tbody>
</table>

(a) (i) Define a laptop computer. (1 mark)
(ii) The screen is said to be 17 inches. Explain what this means.

(b) State one advantage of having each of the following provided with a laptop.

(i) modem

(ii) USB

(iii) free suite

(c) State the software package in the free suite which is most suitable for each of the following:

(i) computing budgets

(ii) creating documents

(iii) designing of brochures

(iv) records management

(d) State three advantages of using a computer to design an advert such as the one in Figure 4.
(ii) State **two** benefits of having the advert uploaded on the internet. (2 marks)

A worker is unable to travel to the office but may still be able to do the office work through telecommuting.

(a) Explain why the worker may use each of the following:

(i) email; (2 marks)

(ii) fax; (2 marks)

(iii) digital camera; (2 marks)
(iv) **firewall.** (2 marks)

(b) The worker needs to make regular backups of documents sent to the office. State **three** reasons for this. (3 marks)

(c) Explain **two** benefits that the employer will get by allowing this worker to do the office work through telecommuting. (4 marks)
20 (a) (i) Differentiate between one’s complement and two’s complement in data representation. (2 marks)

(ii) Explain the preference of binary number systems over decimal number systems in computers. (2 marks)

(b) (i) Using one’s complement, subtract 100011₂ from 010010₂. (4 marks)
(ii) Convert the number \(21.03125_{10}\) to its binary equivalent. (5 marks)

(c) Perform the following binary operations.
\[ \begin{align*}
1101 + 11011 + 101 + 11111 \\
\end{align*} \] (2 marks)