THE UNITED REPUBLIC OF TANZANIA
NATIONAL EXAMINATIONS COUNCIL
CERTIFICATE OF SECONDARY EDUCATION EXAMINATION

036/1 COMPUTER STUDIES 1
(For Both School and Private Candidates)

TIME: 3 Hours 2006/10/24 p.m.

Instructions

1. This paper consists of sections A, B and C.
2. Answer **all** questions in sections A and B, and **four** (4) questions from section C.
3. Show all the steps in your workings, giving answers at each stage.
4. Electronic calculators are **not** allowed in the examination room.
5. Cellular phones are **not** allowed in the examination room.
6. Write your Examination Number on every page of your answer booklet(s).

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SECTION A (20 marks)

Answer all questions in this section.

1. For each of the following items choose the correct answer from among the given alternatives and write its letter beside the item number.

(i) Which of the following network topologies always uses a single communication channel?

A Ring B Star C Bus D Hybrid E Hierarchical.

(ii) If the test condition is true before entry into a FOR . . NEXT loop

A the loop will be executed only once
B the loop will not be executed at all
C a negative increment will occur
D the test condition will be tested for less than rather greater than
E the loop will be executed several times.

(iii) Which of the following refers to the execution of two or more programs by multiple computers?

A Multiprocessing B Multitasking C Timesharing
D Multiprogramming E On-line.

(iv) What is the decimal representation of the hexadecimal number represented by B?

A 8 B 9 C 10 D 11 E 12.

(v) In Excel an intersection of a column and a row forms a

A cell pointer B cursor C cell
D range E formula.

(vi) Another name for auxiliary storage is

A secondary storage B main memory C random access memory
D magnetic tapes E floppy.

(vii) Which of the following is used to hold data and instructions that are to be used shortly by the CPU?

A Peripheral device B Cache memory C RAM chip
D ROM chip E Peripheral drivers.

(viii) In which generation of languages do query languages, report generators and application generators' belong?

A First B Second C Third D Fourth E Fifth.

(ix) Which of the following is not a feature of a DBMS?

A Sequential access storage B Report generator C Utilities
D Query language E Data dictionary.

(x) In programming semantic errors are errors in

A grammar B timing C punctuations
D logic E execution

2. Match the responses in **List B** with the words/phrases in **List A** by writing the letter of the correct response beside the item number.

LIST A	LIST B
(i) A database	A Performs the arithmetic and logical operation
(ii) Utility programs	B An input device
(iii) ALU	C Virus
(iv) Application programs	D A computer network which connects devices widely separated
(v) Data processing	E A BASIC statement which enables data to be entered when a program is in execution
(vi) Information	F Performs housekeeping tasks for a computer system
(vii) An expert system	G The product of data processing
(viii) Assembler	H A programming language
(ix) WAN	I A program that performs duties of a human expert
(x) Input	J Malfunction in a computer
	K The principal function of a computer
	L Converts a source program into an object program
	M An operating system
	N Software available for the specific requirements of end users
	O Describes an algorithm
	P Hard disc
	Q Using one or more programming languages
	R A value that does not change during execution
	S An integrated collection of all files about an organisation
	T Directs other units of hardware

SECTION B (40 marks)

Answer all questions in this section.

3. According to logical design, computers are classified into two main categories.

(a) Name the categories.

(b) What is the main difference between the two categories?

4. Given four values: 4.75; 22.72; 0.334 and 33 to be typed into the worksheet of Microsoft Excel Program in cells AB2, AC2, AB3 and AC3 respectively. Results are to be placed in other cells. You are required to create a

(a) function structure that will compute the product of the given values.

(b) function structure that will compute the average of the given values.

(c) formula structure that will compute the sum of the given values.

(d) formula that will subtract the value in cell AC3 from cell AB2.

5 (a) Show using a diagram the main hardware elements of a computer system.

(b) Name one function of each of the main hardware elements of a computer system.

6 Distinguish between a compiler and interpreter.

7 Below is an algorithm for completing an invoice.

10 Let amount = 0.00

20 Read quantity and price of an item

30 Add the product (quantity and price) to amount

40 If there is another item, go to step 10, otherwise continue with step 50

50 If amount is not greater than 500,000, go to step 80, otherwise, continue with step 60

60 Evaluate the product 0.01 × amount

70 Subtract this product from amount

80 Record the value and amount.

Required:

(a) What is performed in step 60?

(b) What purpose is served in step 50?

(c) If values (10, 3000), (50, 800) and (25, 2000) are read by step 20, what value will be recorded by step 80?

8 Among the categories of viruses are the program and boot viruses. With examples, explain the differences between program and boot viruses.

9 Can the following situations be handled conveniently in a batch processing environment? Give one reason for each situation.

(a) Executing a program that predicts the state of next year's economy.

(b) Executing a video game.

10. Differentiate between the following pairs of phrases.

(a) Data accuracy and data integrity.

(b) Data verification and data validation.

11 Convert the following numbers accordingly.

(a) $1001_2 = X_{10}$

(b) $1259_{10} = X_{16}$

12 Computers have become more user friendly with the development of graphical user interfaces. Give four (4) features of a graphical user interface.

SECTION C (40 marks)

Answer **four** (4) questions from this section.

13 (a) Show the output from the following program.

```
10  FOR I = 1 TO 4
20      FOR J = 1 TO 4
30          LET M(I, J) = I * J
40      NEXT J
50  NEXT I
60  FOR K = 1 TO 4
70      PRINT M(K, K)
80  NEXT K
90  END
```

(b) Define the following terms.

(i) A one-dimensional array

(ii) A two dimensional array

(iii) Sorting

(c) Find and correct the errors in the following program segment. Assume that values have already been assigned to the 5 – by – 5 array A.

```
200  REM PRINT THE SUM S
220  FOR I = 1 TO 5
225      REM LET S = 0
230      FOR J = 1 TO 5
235          LET S = S + A(I, J)
240  NEXT I
245  PRINT S
250  NEXT I
```

14 (a) In BASIC programming, data can be part of the program. Three statements are used to accomplish the task. The statements are

(i) READ

(ii) DATA

(iii) RESTORE

Explain how these statements are used in BASIC programs.

(c) Explain what happens in line 10, 20, 30, 40 and 50 and finally assign values to A, B, C, D, E and F as shown in the program segment given below

```
10    READ  A, B
20    RESTORE
30    READ C
40    RESTORE
50    READ  D, E, F
60    DATA  1, 2, 3, 4, 5, 6
```

11 (a) What is the difference between a pseudocode and an algorithm?

(b) What will be the output of the following program?

```
10    DIM   S(5)
20    PRINT "DAYS",      "SALES"
30    FOR   I      =     1     TO    5
40    READ  S(I)
50    PRINT I,    S(I)
60    NEXT  I
70    DATA  101,  200,  50.5   35.5,  100,   300,   50
80    END
```

16 Use the following diagram to answer the questions given below:

4	2	15	10	2
3	1	7	6	0
2	4	6	1	0
7	8	11	2	5

(a) Write the BASIC statements to dimension this array named TABLE

(b) Write the READ and DATA statements to fill the array with the values shown in the diagram above

(c) What is an array?

17 (a) Name and explain the two (2) main types of variables, giving an example in each case

(b) What are nested loops?

(c) Draw a flowchart and code a simple BASIC program to test and display whether a number input is positive, zero or negative

18 (a) Given a BASIC expression below, show the order of evaluation in the expression using numbers.

A + B (+ 3.2 * sin (Y + 3 * 2))

(b) Distinguish between a built-in function from a user defined function

(c) Explain what the following functions perform:

(i) LEN (ii) LEFT$ (iii) RIGHT$ (iv) MID$