JUNIOR LYCEUM ANNUAL EXAMINATIONS 2009

Directorate for Quality and Standards in Education
Educational Assessment Unit

FORM 5 (Option) **COMPUTER STUDIES** **TIME: 1 hr 45 min**

Name: _____ **Class: _____**

***Directions to Candidates**:*

*Answer **ALL** questions in **Section A** on this paper;*
*Answer any **TWO** questions from **Section B** on separate foolscaps;*
The use of flow chart template is permitted;
*Calculators are **NOT** allowed;*
Good English and orderly presentation are important.

For office use only:

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Paper Total	Course Work	Final Mark
Max	5	5	5	5	5	5	5	5	5	5	5	15	15	15	85%	15%	100%
Mark																	

Section A - Answer all Questions

1 (a) Differentiate between **standalone** and **networked** computer systems.

Difference: _____

_____

[1]

(b) **LAN** and **WAN** are two types of network systems. What is the **main difference** between the two types?

Difference: _____

_____

[1]

(c) Mention two **advantages** and one **disadvantage** of having a networked computer rather than a standalone computer.

1st Adv.: _____

2nd Adv.: _____

Disad.: _____

[3]

2 (a) Why is the **binary number system** used with digital computers?

Answer: _____

_____

[1]

(b) Convert the Hexadecimal number ***A2*** to **binary** and then to **decimal**.
Space for working:

Binary: _____

Decimal: _____

[2]

(c) Using **8 bits** show how ***-85*** is represented in binary using **two's complement**.
Space for working:

-85 = _____

[2]

3 (a) Define **access time** as used in RAM.

Access time: _____

_____

[1]

(b) **FAT** is one type of **disk filing system**.

i. What does the acronym FAT **stand for**?
ii. What is this disk filing system **used for**?
iii. Mention two **items of information** stored in such a filing system.

i. **FAT:** _____

ii. **Used for:** _____

_____

iii. **Item 1:** _____

Item 2: _____

[4]

4 (a) Differentiate between **source code** and **executable code**.

Difference: _____

_____

[1]

(b) i. Why is a **language translator** required when programming in a high-level language?
ii. **Assemblers**, **Compilers** and **Interpreters** are three different translators. What makes **each translator different** from the others?

i. **Translators:** _____

_____

ii. **Assembler:** _____

Compiler: _____

Interpreter: _____

[4]

5 (a) i. Why is a **structure chart** (structure diagram) important in solving co problems?

ii. What is the **name of another graphical tool** used to design the solution to a problem?

Structure chart: _____

_____

Graphical tool: _____

[2]

(b) The **code** below is supposed to allow the input of ten (10) numbers and then finds the total and the largest of the inputted numbers. However the code has an **error**. *Each instruction has been numbered for ease of identification.*

```
Line 1:     Program example;
Line 2:     Var
Line 3:       k, s, m, n : integer;
Line 4:     Begin
Line 5:       s := 0;
Line 6:       m := 0;
Line 7:       For k := 1 to 10 do
Line 8:       Begin
Line 9:         Write('Enter number: ');
Line 10         Readln(n);
Line 11         Writeln;
Line 12         s := s + n;
Line 13         If n < m
Line 14:          then m := n;
Line 15:      End;
Line 16:      Write('The total is: ', s, ' and the max is: ',m);
Line 17:    End.
```

i. Write the **line number** of the instruction where there is the error.

ii. What **type of programming error** was generated?

iii. Write down the **corrected instruction**.

i. **Line number:** _____

ii. **Type of error:** _____

iii. **Correct instruction:** _____

[3]

6 (a) i. What is **Process Control**?

ii. Give an **example** where process control is used.

i. **Process Control:** _____

_____

ii. **Example:** _____

[2]

(b) Computers can be classified as either **general-purpose** or **dedicated**.

i. What is the **difference** between the two classes of computers?

ii. Give two **examples** of dedicated computers as found in home appliances.

i. **Difference:** _____

_____

ii. **1st Example:** _____

2nd Example: _____

7 **Word processing** applications facilitate the work of clerks in an office.

i. Mention one **reason** why the statement above is true.

ii. Explain the terms **pagination, indentation** and **multi-columns** as used in word processing.

iii. Suggest one **good practice** to avoid the loss of large amounts of data in case of an electricity failure.

i. **Reason:** _____

_____

ii. **Pagination:** _____

_____

Indentation: _____

_____

Multi-columns: _____

_____

iii. **Good practice:** _____

_____

[5]

8 (a) i. What is a **logic gate**?

ii. Mention one **use** of logic gates in computers.

i. **Logic gate:** _____

_____

ii. **Use:** _____

[2]

(b) Using **AND**, **OR** and **NOT** gates draw the logic circuit which corresponds to the truth table below.

A	B	C
0	0	0
0	1	1
1	0	0
1	1	0

Space for circuit:

[3]

9 (a) Network systems are vulnerable to unauthorized access to data. Briefly explain two **security measures** which may be adopted to protect oneself from unauthorized access.

1st security: _____

_____

2nd security: _____

_____

[2]

(b) Since 2001 Malta adopted the **Data Protection Act**. Mention three important **principles** of this act.

1st Principle: _____

_____

2nd Principle: _____

_____

3rd Principle: _____

_____

[3]

10 For each of the following tasks, state the **best application** to use.
The first one is given as an example.

i. Holding information about books: ***database***

ii. Designing a kitchen: _____

iii. Preparing the school's magazine: _____

iv. Typing a letter to your friend: _____

v. Preparing an invoice for a shop: _____

vi. Searching for a product on the computer: _____

[5]

11 Mention one **main duty** of each of the following five IT-related staff.

Programmer: _____

_____

I.T. Trainer: _____

_____

Operator: _____

_____

Web Master: _____

_____

Computer Technician: _____

_____

[5]

Section B – Answer any TWO Questions

12 (a) Software may be split into two categories, namely Application software and System software. The **operating system** (OS) is an example of system software.

i. Mention three **main functions** of an operating system. [3]

ii. **Real Time OS**, **Batch OS** and **Time Sharing OS** are three types of operating systems. **Differentiate** between the three types of OSs and for each type provide a **suitable application**. [6]

(b) Study the following **assembly language program** and then answer the questions set on it. *A semicolon (;) introduces a comment which explains the function of that instruction.*

```
        LDA   6          ; Load the number 6 into the accumulator
here :  STA   D          ; Store the contents of accumulator into D
        DEC   D          ; Decrement the contents of D by 1
        LDA   D          ; Load the contents of D into the accumulator
        JNZ   here       ; Jump to 'here' if contents of accumulator < > 0
        HLT              ; Stop
```

i. A typical assembly language instruction (e.g. LDA 6) consists of two parts. What is each **part** called?

ii. How many **times** will the loop in the program above be repeated?

iii. From the program above write down a **label** and a **mnemonic**. [6]

13 Write **instructions in Pascal** that perform the following eight tasks. *You are n required to write complete programs for any task.*
Marks are awarded for the correct Pascal syntax.

(a) Store the value **23** into variable **NUMBER.** [1]

(b) Increment the variable **COUNT** by 2**.** [1]

(c) Store the result of the expression $\mathbf{B^2 + C^2}$ in variable **ANSWER**. [2]

(d) Swap the values in variables **NUM1** and **NUM2** (that is, the value in NUM1 is moved into NUM2 and the value in NUM2 is placed in NUM1) [2]

(e) Display the message **OK** if the value in variable **D** is within the range 1 to 6, otherwise display the message **OUT OF RANGE**. [2]

(f) Declare an array **MARKS** to store 20 integers. [1]

(g) Use a loop to **input 20 integers** at runtime into the array of part (f) above. [3]

(h) Input an examination mark between 0 and 100 and store in variable **MARK**. Accept the mark only if it is within range. Otherwise ask the user to input the mark again. *Hint: use a Repeat…Until loop* [3]

14 The librarians in your school have asked you, as a **system analyst**, to investigate their manual procedures with the eventuality of changing to a computerized system.

(a) For each of the following **six stages**, explain what you would do for the case study mentioned above.

1. Feasibility study
2. Present system study and Analysis
3. Design of new computerized system
4. Programming
5. Change over methods
6. System maintenance

[12]

(b) As the system analyst for the library system, you have decided on developing **tailor-made programs** rather than buying **off-the-shelf** software. Mention two **advantages** and one **disadvantage** of tailor-made software over off-the-shelf software. [3]