JUNIOR LYCEUM ANNUAL EXAMINATIONS 2010

Directorate for Quality and Standards in Education
Educational Assessment Unit

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

Name: _____ **Class: _____**

***Directions to Candidates**:*

*Answer **ALL** questions in **Section A** on this paper;*
*Answer **BOTH** questions in **Section B** on separate foolscaps;*
The use of a 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**	**Paper Total**	**Course Work**	**Final Mark**
Max	5	5	5	5	5	5	5	5	5	5	5	15	15	85%	15%	100%
Mark																

Section A - Answer all Questions

1 (a) Differentiate between **syntax** and **logical** errors as used in programming.

Difference: _____

_____

_____

[1]

(b) The program below allows the **input** of the radius of a circle and then **finds** and **displays** the area of the circle to two decimal places. However the program has **two** errors. Write down:

i. The instructions that contain the **errors**, and

ii. The **corrected** instructions.

```
Program Circle;

Const
 pi = 22/7;

Var
 A, r : Real;

Begin
 Write('Enter the radius: ');
 Readln(r);
 A := pi*sqr(l);
 Writeln('The area of the circle is: ',);
 Readln;
End.
```

1st Error: _____

Corrected: _____

2nd Error: _____

Corrected: _____

[4]

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

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

Process Control: _____

_____

Example: _____

[2]

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

i. What is a **dedicated** computer?

ii. Give two **examples** of dedicated computers.

Dedicated: _____

_____

Example 1: _____

Example 2: _____

[3]

3

i. Define the terms **network** and **bandwidth**.
ii. Mention one typical **application** of a WAN network.
iii. What is the purpose of a **modem** in networking?
iv. **Satellite links** and **twisted pair cable** are two communication media used in networking. Give another **example** of a communication medium.

Network: _____

_____

Bandwidth: _____

_____

WAN application: _____

Modem: _____

_____

Example: _____

[5]

4 (a) Software publishers employ hardware and/or software techniques to protect their software against piracy.

i. What is **software piracy**?
ii. Give an example of a **hardware** and of a **software protection** technique.

Piracy: _____

_____

Hardware: _____

Software: _____

[3]

(b)

i. What is the **reason** behind the Data Protection Act?
ii. What is the role of the **Data Controller** in relation to the Data Protection Act?

Reason: _____

_____

Data Controller: _____

_____

[2]

5 (a) System Analysts spend time investigating the problem/s in the present system. Mention three **methods** they may use to investigate a system.

1st Method: _____

2nd Method: _____

3rd Method: _____

[3]

(b) The analyst/programmer has to design the solution to a problem before the source code is written. Mention two **design** tools that the analyst/programmer uses to solve a problem.

1st Tool: _____

2nd Tool: _____

[2]

6 (a) Differentiate between data **verification** and data **validation**.

Verification: _____

_____

Validation: _____

_____

[2]

(b) i. What is a **check digit** and why is it used?
ii. Mention one **example** where check digits are found.
iii. Briefly explain how a **range check** may be applied when inputting an examination mark.

Check digit: _____

_____

Example: _____

Range check: _____

_____

[3]

7 A DBMS package is a powerful tool to store and manipulate data.

(a) i. Differentiate between a **relational database** and a **flat database**.
ii. Give a typical **commercial application** of a relational database.

Difference: _____

_____

_____

Application: _____

[2]

(b) The table below shows part of the students' file in a particular school. **Use the table** to explain your answers to the following questions.

i. What is **sorting**?
ii. Give an example of a **Simple Query**.
iii. Give an example of a **Compound Query**.

Name	Surname	Form	Town
John	Abela	3	Siggiewi
Patrick	Farrugia	4	Naxxar
Tania	Curmi	5	Munxar
Marija	Farrugia	4	Siggiewi
Tonio	Zammit	3	Qrendi
Vanessa	Portelli	5	Msida

Sorting: _____

_____

Simple Query: _____

_____

Compound Query: _____

_____ [3]

8 (a) Mention two **registers** found in the **Control Unit** of the CPU and explain their use.

1st Register: _____

Use: _____

_____

2nd Register: _____

Use: _____

_____ [4]

(b) What is the purpose of the **accumulator** in the ALU?

Accumulator: _____

_____ [1]

9 **Format**, **Defragmentation** and **Antivirus** are three important utilities in computers.

i. What is meant by **formatting** a hard disk?
ii. Mention one **precaution** that should be taken when formatting a hard disk that was already in use? Why the **need** for this precaution?
iii. What is **defragmentation**?
iv. Give one **function** of the **antivirus** software.

Formatting: _____

_____

Precaution: _____

_____

Need: _____

_____

Defrag: _____

_____

Function: _____

_____ [5]

10 The **Fetch Execute Cycle** is the method used by the CPU to obey an instruction. Explain the **sequence of steps** involved in the fetch execute cycle.

1: _____

_____

2: _____

_____

3: _____

_____

4: _____

_____

5: _____

_____

6: _____

[5]

11 (a) Mention one typical **item/section** found in the:
- User Documentation;
- Technical Documentation and
- Program Documentation.

User: _____

Technical: _____

Program: _____

[3]

(b) Programmers dedicate a lot of time in **testing** their programs. Mention two **methods** that a programmer may use to check that his/her program is working correctly.

1st Method: _____

2nd Method: _____

[2]

Section B on following page

Section B – Answer BOTH Questions

12 (a) Consider the following Boolean Expression:

$$X = ((\overline{A + B}).C) + \overline{C}$$

For the given Boolean Expression draw:

i. The **Logic Circuit** and [5]

ii. The **Truth Table**. [4]

(b) Using **Twos Complement** represent the following two decimal numbers in **8 bits**:

i. 110 and [1]

ii. -75 [2]

(c) The character set of a particular computer consists of:

- The English alphabet (26 letters);
- The digits 0 to 9, and
- The four punctuation symbols: . (period), ; (semi-colon), ! (exclamation mark) and ? (question mark).

What is the **minimum number of bits** required to store this character set? [2]

(d) What happens if the **result** of the addition of the two unsigned numbers 250 and 50 is being stored in an 8-bit register? [1]

13 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   #0      ; load 0 into accumulator
        STA   P       ; store contents of accumulator into location P
        LDA   #4      ; load 4 into accumulator
        STA   K       ; store contents of accumulator into location K
here:   LDA   P       ; load contents of location P into accumulator
        ADD   K       ; add contents of location K into accumulator
        STA   P       ; store contents of accumulator into location P
        LDA   K       ; load contents of location K into accumulator
        DEC           ; decrement contents of accumulator by 1
        STA   K       ; store contents of accumulator into location K
        JNZ   here    ; jump to 'here' if accumulator is not zero
        HLT           ; stop
```

i. A typical assembly language **instruction** consists of two parts. What is each **part** called? [2]

ii. Part of the program above forms a loop. How many **instructions** form the loop? [1]

iii. What are the values of **P**, **K** and the **Accumulator** immediately after the loop is executed for the first time? [3]

iv. What are the values of **P** and **K** when the program finishes execution (that is, the last HLT instruction is executed)? [4]

v. Write a **program in Pascal** which does the same task as the assembly language program above. [5]