

# JUNIOR LYCEUM ANNUAL EXAMINATIONS 2008

Educational Assessment Unit – Education Division

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**FORM 5 (Option)**

**COMPUTER STUDIES**

**TIME: 1 hr 45 min**

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**Name:** \_\_\_\_\_

**Class:** \_\_\_\_\_

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***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.*

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*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) Give **two** reasons to show why digital computers are based on the binary number system.

**1<sup>st</sup> reason:** \_\_\_\_\_

**2<sup>nd</sup> reason:** \_\_\_\_\_

[2]

- (b) The character set of a particular computer consists of the upper and lower case letters of the English alphabet (26 letters each), the digits 0 to 9, and the three characters >, < and =. How many bits are required to code all the character of such a computer?

**Answer:** \_\_\_\_\_

[1]

- (c) Write down the **two's complement** representation in 8 bits of the following values:

i) 80

ii) -70

**i.:** \_\_\_\_\_

**ii.:** \_\_\_\_\_

[2]

- 2 (a) A **modem** is required for communicating over the Internet.

- i. Briefly explain why the modem is needed?
- ii. What unit of measurement is used for the data transmission speed of the modem?

**Why modem:** \_\_\_\_\_

**Measurement:** \_\_\_\_\_

[2]

- (b) **Video conferencing** has revolutionized the way with which people communicate with each other.

- i. Briefly explain what is Video Conferencing?
- ii. Give **two important** peripherals used in video conferencing.

**Video Conferencing:** \_\_\_\_\_

**1<sup>st</sup> peripheral:** \_\_\_\_\_

**2<sup>nd</sup> peripheral:** \_\_\_\_\_

[3]

- 3 (a) **CAL** packages are increasingly being used in schools, industries, etc.

- i. What does the acronym CAL stand for?
- ii. Briefly describe what are CAL packages?
- iii. Give **two** advantages for using a CAL package.

**CAL:** \_\_\_\_\_ [1]

**Describe CAL:** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_ [2]

**1<sup>st</sup> Advantage:** \_\_\_\_\_  
\_\_\_\_\_

**2<sup>nd</sup> Advantage:** \_\_\_\_\_  
\_\_\_\_\_ [2]

**4** In a hospital, the grandfather-father-son filing system is used to maintain backup copies of their databases.

(a) State whether such a measure is for data integrity or for data security.

\_\_\_\_\_ [1]

(b) Briefly describe how this grandfather-father-son filing system is performed.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_ [3]

(c) Mention one additional precaution that needs to be taken with the backup copies.

\_\_\_\_\_ [1]

**5** **Loops** help in writing better and shorter programs.

(a) The **For...To...Do** loop is one loop structure in Pascal. Draw the generic **flowchart** of this loop.

*Space for flowchart:*

[1]

- 
- (b) Write a Pascal program using **For** loops, which ask the user to enter 10 integer numbers that are stored in an **array**. The contents of the array are then output on screen.

*Space for program:*

[3]

- (c) Name one other loop structure in Pascal.

[1]

- 
- 6** (a) Although **Assembly Language** is a low level language, programmers prefer to use it in particular situations. Give **one** advantage of using Assembly Language when compared to higher level languages.

**Reason:** \_\_\_\_\_  
\_\_\_\_\_

[1]

- (b) Assembly Language needs to be translated to object/executable code.
- What is the name of the **translator** used for Assembly language programs?
  - Why is this translation into object/executable code necessary?

**i. Translator:** \_\_\_\_\_

**ii. Reason:** \_\_\_\_\_

\_\_\_\_\_

[2]

- (c) The following Assembly language snippet shows how two numbers are fetched from memory, added together and the result stored back in memory. *Symbolic addressing has been used and the semicolon (;) introduces a comment.*

```
LDA n1      ; copy the contents of n1 to the accumulator
ADD n2      ; add the contents of n2 to the accumulator
STA tot     ; copy the contents of the accumulator to tot
STP         ; stop
```

Rewrite the program to show how the same two numbers are **subtracted** and the result written to symbolic address **ans**. (There is no need to write the comments)

*Space for answer:*

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

[2]

- 7 (a) Logic Gates may be described as small switches that may be combined together to form a circuit. Give **one use** of logic gates/circuits in computers.

**Use:** \_\_\_\_\_

[1]

- (b) For the Boolean expression:

$$X = (\bar{A} \cdot B) + (C + B)$$

- Draw a logic circuit which represents X
- Using A, B and C as inputs draw the truth table for the output X.

[4]

8 The Data Protection Act became law in Malta in 2001.

(a) What is the **purpose** of this law?

**Purpose:** \_\_\_\_\_  
\_\_\_\_\_

[1]

(b) The law mentions the task of **Data Controllers**. What is their task?

**Task:** \_\_\_\_\_  
\_\_\_\_\_

[1]

(c) Give **three** important **principles** from this law regarding the keeping of personal data.

**1<sup>st</sup> Principle:** \_\_\_\_\_

**2<sup>nd</sup> Principle:** \_\_\_\_\_

**3<sup>rd</sup> Principle:** \_\_\_\_\_

[3]

9 (a) The **Operating System** is the most important software in a computer system. Apart from **managing** the I/O devices and the files in secondary store, it manages other hardware. Mention **one** other hardware that the operating system manages.

**Management of:** \_\_\_\_\_

[1]

(b) Different types of operating systems are needed for different situations. Four types of operating systems are: **single-user**, **networked**, **multi-user** and **multi programming**. Distinguish between the four types of operating systems.

**Single-user:** \_\_\_\_\_

**Networked:** \_\_\_\_\_  
\_\_\_\_\_  
**Multi-user:** \_\_\_\_\_  
\_\_\_\_\_  
**Multi programming:** \_\_\_\_\_  
\_\_\_\_\_

[4]

- 10 (a) Computer systems can be either **general purpose** or **dedicated**.
- Distinguish between the two types of computer systems.
  - Give an example of a dedicated computer system.

**General purpose:** \_\_\_\_\_  
\_\_\_\_\_  
**Dedicated:** \_\_\_\_\_  
\_\_\_\_\_  
**Example:** \_\_\_\_\_

[3]

- (b)
  - What is **Process Control**?
  - Give an example of a process control system used in everyday life.

**Process control:** \_\_\_\_\_  
\_\_\_\_\_  
**Example:** \_\_\_\_\_

[2]

- 11 (a) A new LAN system may be set up as either a **client-server** (or centralized data) **system** or as a **distributed data system**.
- Briefly describe how the **client-server system** is implemented
  - Give **one** advantage of the client-server system.
  - Give **one** disadvantage of the client-server system.

**Client-server:** \_\_\_\_\_  
\_\_\_\_\_  
**Advantage:** \_\_\_\_\_  
**Disadvantage:** \_\_\_\_\_

[3]

- (b) The amount of data that can be sent over a network line depends on the **bandwidth**.
- What is **bandwidth**?
  - Besides the telephone line, name another transmission medium used in WANs.

**Bandwidth:** \_\_\_\_\_  
\_\_\_\_\_

Example:

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[2]

**Section B – Answer any TWO Questions**

- 12** When coding programs in Pascal it is very easy to make mistakes.
- (a) i. Name the **three** common types of programming errors. [1]  
ii. Give an example of each type of error. [3]
- (b) Write the following program in Pascal.
- Ask the user to enter **how many** students in a particular class sat for a test
  - Prompt the user to enter the **names** and the **marks** of the students, storing them in two separate arrays
  - Display the names of those students who have **passed** the test (50 is the pass mark)
  - Display the average mark of the test correct to 2 decimal places
- Marks are allocated for: good program listing, good syntax and comments.* [11]
- 13** (a) A simple classification of programming languages is to split them up into two types: **Low Level Languages** and **High Level Languages**.
- i. Mention **two** main differences between the two types of languages. [2]  
ii. Programs written in high level languages need translation before execution. Name the **two** high level language translators. [1]  
iii. **Source code** and **Executable code** are two formats of a program. Briefly explain the difference between them. [2]
- (b) In an EDP department the **Systems Analyst/Designer, Programmer, I.T. Trainer, Computer Operator** and **Computer Technician** have different job descriptions. Mention **four responsibilities** for each of the above-mentioned personnel. [10]
- 14** Spreadsheets and databases are two applications for storing and processing data.
- (a) i. What does the acronym **DBMS** stand for?  
ii. What is a DBMS? [3]
- (b) i. What is a **relational databases**?  
ii. Explain **two** advantages of a relational database over the traditional (flat-file) database. [3]
- (c) **Name and explain** THREE features of a database application which makes it more suitable to hold/process information when compared to the spreadsheet application. [3]
- (d) **Describe** two essential **security measures** that must be implemented when setting up a database for a large company having a networked system. [4]
- (e) It is common to input **incorrect** data during the entry process of data in a database. For example, the number 13579 is erroneously typed as 31579 causing a transposition error.  
Use the number 13579 to name and provide an example of the other **two** data entry errors. [2]