JUNIOR LYCEUM ANNUAL EXAMINATIONS 2004
Educational Assessment Unit – Education Division

FORM 4 (Option) **COMPUTER STUDIES** **TIME: 1 hr 30 min**

Name: _____ **Class:** _____

***Directions to Candidates**:*

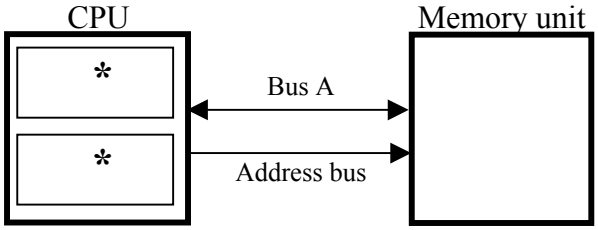
*Answer **ALL** questions in **Section A** on this paper;*
*Answer any **TWO** questions from **Section B** on separate foolscaps;*
The use of flow chart template is permitted;
*Calculators are **NOT** allowed;*
Good English and orderly presentation are important.

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 The following is an incomplete diagram of the **CPU**, the **memory unit** and **buses**. The two **sub units** of the CPU have been marked with '*'.



(a) Write down the **names** of the sub units and explain their **purposes**.

Name of sub unit: _____

Purpose: _____

_____

_____

Name of sub unit: _____

Purpose: _____

_____

_____ [4]

(b) Write down the **name** of Bus A and explain its **purpose**.

Name of Bus A: _____

Purpose: _____

_____ [1]

2 Write a short note to explain the **use** of the following **computer applications**.

(a) CAD-CAM system: _____

_____

_____ [1]

(b) Flight simulation: _____

_____

_____ [1]

(c) Stock control system: _____

_____

_____ [1]

(d) Book lending library system: _____

_____

_____ [1]

(e) WWW: _____

_____

_____ [1]

3 Complete the following **number conversion table**. *Use the space beneath the table for your working.*

Decimal	Binary	Hexadecimal
173		
	110 1110	
		FF

[5]

4 (a) By using **2's complement** 8-bit binary representation, perform the operation **37 – 68** to show that the result is –31.

[3]

(b) What do you understand by the term **register**?

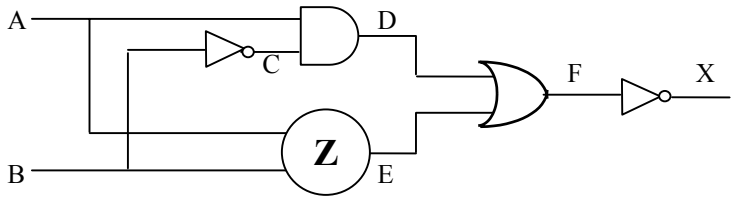
_____

_____ [1]

(c) Write down the **smallest** (that is, negative) number in **2's complement** that can be stored in an **8-bit register**.

_____ [1]

5 Look carefully at the following **logic circuit** and its incomplete **truth table**:



A	B	C	D	E	F	X
0	0					
0	1					
1	0	**1**	**1**	**0**	**1**	**0**
1	1					

(a) What type of **logic gate** is the circle labelled Z, representing?

_____ [1]

(b) Complete the **truth table** above. [2]

(c) Write the **Boolean expression** to show the relationship between the inputs A and B and the output X.

X = _____ [2]

6 (a) It is important that data entered in a computer is **complete** and **correct**. **Name** and **describe** TWO different types of **data validation checks**.

i) _____

_____

ii) _____

_____ [2]

(b) One **field** in a student **database information system** is the **class** the student is in, for example, 4B. Complete the following table for this particular field.

Field name	Data type	Field length	Validation check required

[3]

7 (a) Explain the **difference** between the following **software packages**.

Off-the-shelf package: _____

_____

Customisable package: _____

_____

Tailor-made package: _____

_____ [3]

(b) A new software package has to be **installed** before it can be used. Explain what happens during the **installation of software**.

_____

_____ [1]

(c) What is **software piracy**?

_____

_____ [1]

8 (a) List FOUR **features** (or sections) that you expect to find in the **User documentation** that accompanies a software package.

_____

_____ [2]

(b) Explain the difference between **User documentation** and **Program documentation**.

_____

_____

_____ [2]

(c) Name the **person** who may need to consult the Program documentation.

_____ [1]

9 (a) **Name** and give an **example** of the three **types of errors** that may be found in a program.

1. _____

_____

2. _____

_____

3. _____

_____ [3]

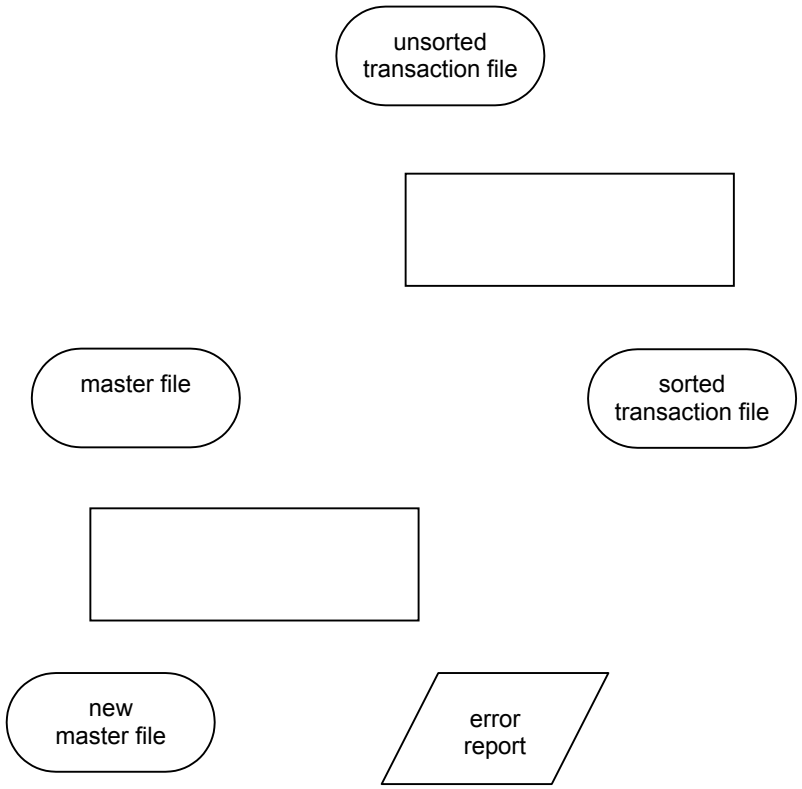
(b) You have developed a program to process examination marks. A mark should only be accepted if it is between 0 and 100. Give TWO examples of **test data** that you will input to check that this part of the program is working properly. Give **reasons** for your choice.

_____

_____

_____ [2]

10 The following incomplete diagram shows how a **transaction file** updates the **master file**.



(a) Fill the two rectangles with the **type of task** being performed.

Draw arrows in the diagram above to show the **flow of data** between the symbols. [3]

(b) All transactions are first stored on the transaction file and then at certain **intervals of time** the master file is updated. What is this **type of processing** called?

_____ [1]

(c) Give the **name of an application** that makes use of master/transaction file system.

_____ [1]

11 (a) Write a Pascal **program** that prints the word "HELLO" on the screen, each time the user types a number. The program stops when the user enters the number 999 in the variable *stop*.

[3]

(b) What is the **programming structure** of part (a) above called?

_____

Write down ONE **advantage of using** such a programming structure.

_____

_____ [2]

Section B – Answer TWO Questions only

12 (a) Draw a **flowchart** for an algorithm that automatically generates and prints on the screen **two sets of numbers**. The first set that is displayed consists of the **odd** numbers between 1 and 10, while the second set displayed consists of the **even** numbers in the same range. [10]

(b) Write down the **two sets of numbers** that you expect to see when the algorithm is executed. [2]

(c) Design a **table** with appropriate headings that will help you perform a **dry run** of the algorithm. *You do not have to dry run the algorithm.* [3]

13 Write a **program** in the Pascal language that allows the user to **enter five numbers** in the range 1 to 20. These five numbers are stored in a one-dimensional **array**. The program will then scan the array and print on the screen the **five numbers in ascending order** (smallest first).

Include **in-line comments** that describe what each section of your code is doing. [15]

14 Max Video is a Video/DVD lending shop. The owner decides to computerise his lending system. He requires somebody to carry out the analysis of the present manual system and then develop a new system that makes the process of lending Videos/DVD more efficient. You have been asked to carry out this project.

(a) List the **seven stages** of the project. [4]

(b) Name ONE method that you can use to **investigate** the present manual system. [1]

(c) During a particular stage you will have to decide on the type of structures in which you will organise your data. Name the **files** to be used and for each file describe the **file specifications**. [6]

(d) Describe ONE **feature** that you will implement in the new system as a **precaution against loss of data**. [1]

(e) Name and describe ONE method that can be used to **stop** using the **manual system** and **begin** using the **new system**. [1]

(f) Mention and describe TWO **operations** that the user of this new system can perform. [2]