KULLEĠĠ SAN BENEDITTU
Boys' Secondary, Kirkop

HALF-YEARLY EXAMINATION – 2011/2012

Track 3 (JL)

FORM 4	COMPUTING	TIME: 1h 30min

Question	1	2	3	4	5	6	7	8	Global Mark
Max. Mark	10	15	8	8	22	10	13	14	**100**
Mark									

Instructions to students:
Answer **ALL** *questions.*
Calculators are **NOT** *allowed; Good English and orderly presentation are important.*
Read carefully each question

DO NOT WRITE ABOVE THIS LINE

Name: _____   Class: _____

1. **This question covers various topics covered in Computing. Fill in each of the following statements with a suitable word.** **[10 marks]**

		Answer
a.	A hardware which is considered both an input and an output device.	
b.	A method of sending electronic letters via the World Wide Web.	
c.	The number system used in computing, made up of letters and numbers.	
d.	This is the 2nd fastest computer and is used by various companies.	
e.	An algorithm done during the design stage, before the actual programming starts.	
f.	A storage device with sequential file access.	

g.	Software used for doing presentations in front of an audience.	
h.	The printed version of a soft copy.	
i.	The code written by the programmer.	
j.	The process of moving unused old files from the hard disk to a secondary storage device instead of deleting them.	
k.	Smallest unit of storage also called Binary Digit.	
l.	A set of related records considering one particular subject.	
m.	A storage device storing up to 700 MB.	
n.	A company offering Internet Connectivity.	
o.	An output device used by architects to produce large printouts.	
p.	The term used to refer to RAM and ROM.	
q.	This data is continuous and has different values.	
r.	An image made up of pixels.	
s.	An input device used by designers to draw freehand sketches.	
t.	This data is fixed and has only two values 0 and 1.	

2. This question is on Database.   [15 marks]

a. Fill in the spaces in the paragraph on next page by using the words from the following list: [5]

sort	database	item	utility	file
record	backup	fields	keyfield	search

In a hospital, a _____ for each patient is kept in a patient-record _____. One of the _____ in each record contains the patient's surname, e.g. GALEA. GALEA is called an _____ of information. Each patient has a unique patient-number which is used as the _____ when a _____ is undertaken for the details of a particular patient. The entire file is called a _____. When the records are required in alphabetical order, the surname field is used by a _____ program, sometimes known as a _____. A _____ copy of the file is made for security against accidental loss.

b. List **THREE** fields that would be in a patient's record, in addition to their patient number, name, surname and address. [3]

Field 1	Field 2	Field 3

c. Patient records need to be **amended**, **deleted** and **inserted**. Give an *example* of why each of these would be needed. [3]

Amended: _____

_____

Deleted: _____

_____

Inserted: _____

_____

d. Explain the meaning of the following terms and why these are used in a database: [4]

i. Table

_____

_____

ii. Form

_____

_____

iii. Query

_____

_____

iv. Report

_____

_____

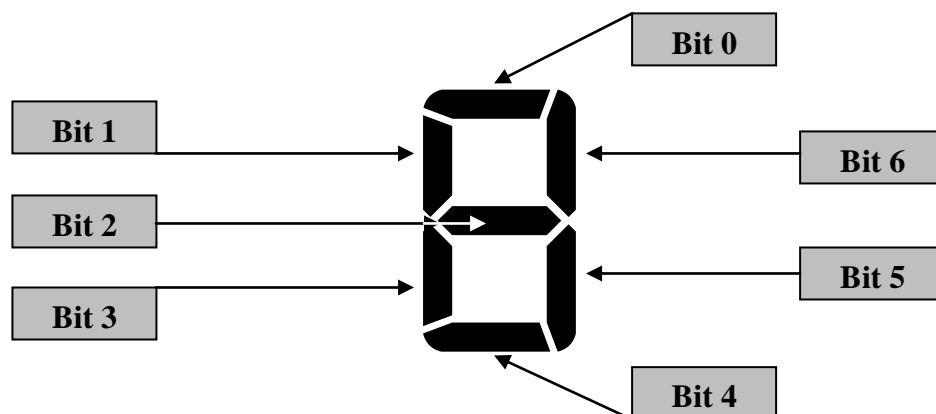## 3. This question is on Number Conversions. [8 Marks]

An LCD display is made up of seven segments as shown below. To display the digits, the correct segments have to be switched on.

A byte of data is sent to the LCD such that each bit controls one segment with the exception of bit 7. If a bit is 1, the segment is switched on. If a bit is 0, the segment is switched off. Assume bit 7 is always 0.

To display digit 8 shown above, the following byte of data 01111111 is sent to the LCD.

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	1	1	1	1	1	1	1

a. Convert the numbers in the table on next page into binary **according to their base** and state which digits are displayed on the LCD. The first one is worked for you. [6]

Number	Base	Binary	Display
127	**Decimal**	01111111	8
55	**Decimal**		
66	**Hexadecimal**		
75	**Hexadecimal**		
96	**Decimal**		

Space for working:

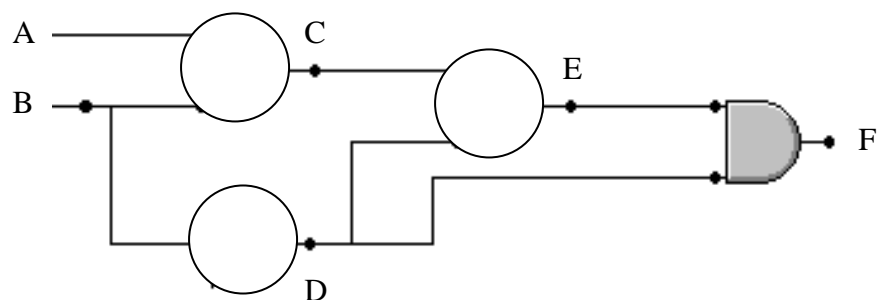b. Is the number $9H7_{16}$ a valid Hexadecimal number? Why?   [2]

_____

_____

_____

4. This question is on Computer Logic.   [8 marks]

The figure below shows a logic circuit with some gates not named and its incomplete truth table on next page.

a. Using the information given on the truth table below, identify and write down below the names of the three missing logic gates. [3]

Logic Gate C	Logic Gate D	Logic Gate E

b. Complete the truth table to show the output F. [1]

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

c. What is a Truth Table? [2]

_____

_____

d. Write down the Boolean expression of this logic circuit. [2]

_____

Working for expression:

## 5. This question is on the CPU and the Fetch and Execute Cycle. [22 marks]

a. Fill in the blanks with the following words. [12]

Program Counter	Address Bus	Registers	System Bus
Memory Data Register	System Clock	Memory Address Register	Instruction Set
Control Bus	Data Bus	Instruction Register	Main Memory

i. The speed at which the CPU can operate is determined by the _____.

ii. The _____ is physically outside the CPU but it is still directly accessed by the CPU.

iii. _____ are small-sized, high-speed (as they are accessed more often than main memory), temporary storage locations inside the ALU.

iv. _____ holds the address of the next instruction to be executed.

v. _____ holds the instruction currently being executed.

vi. _____ holds the address of the memory location (usually taken from the PC) being accessed during a memory read (fetching data from memory) or write (putting data into memory) operation.

vii. _____ temporarily holds the data/instruction sent over the data bus during a read/write operation.

viii. The _____ is a pathway made of wires or lines, which connect together the processor, memory and I/O controllers.

ix. The _____ is used to identify particular locations in memory.

x. The _____ is used to move actual data and instructions between the processor, memory and peripheral devices.

xi. The _____ is used to transmit control signals as to control the operations and the data flow between the memory unit, ALU and other peripherals.

xii. An _____ is the complete collection of instructions a CPU is instructed to obey. It is a means of controlling the CPUs circuitry.

b. Fill in the missing words in the following sentence with your own words.   [2]

The Fetch and Execute cycle is the complete process of retrieving an instruction from store, _____ it and _____ it.

c. Look carefully at the diagram below and write down the steps of the Fetch and Execute cycle. [8]
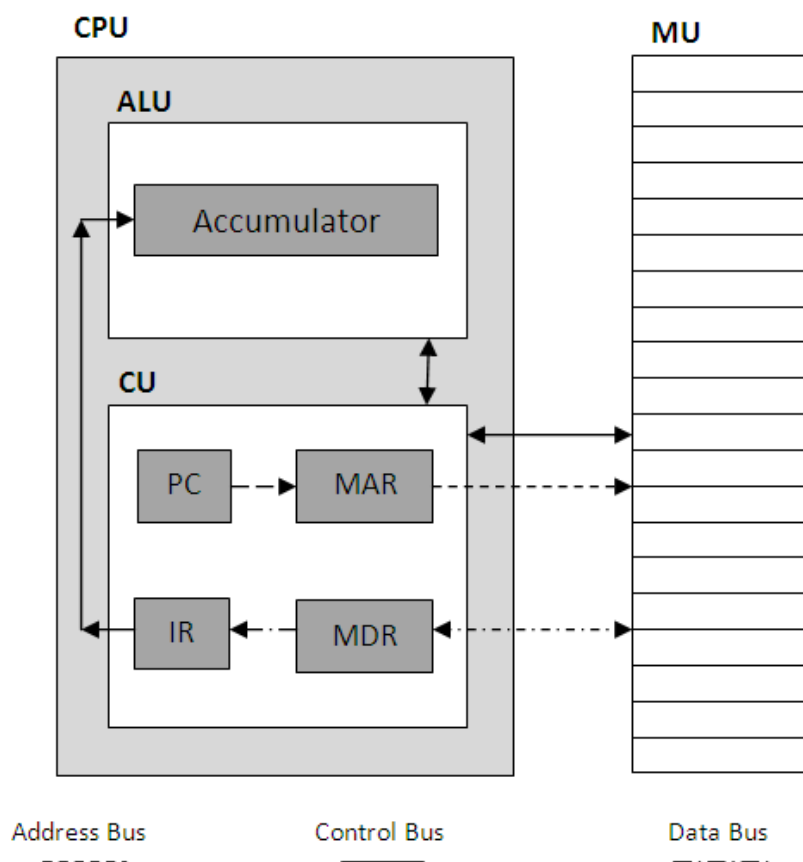
i. The CU looks for _____.

ii. The address is then moved _____.

iii. The instruction is fetched from memory _____

iv. Then it is moved to _____.

v. At the same time, the Program Counter is _____

_____.

vi. The instruction stored in the Instruction Register is _____.

vii. After being decoded, the instruction is then _____.

viii. It is finally stored _____.

ix. The same cycle starts over again.

6. This question is on Registers. **[10 marks]**

    a. What is the MAXIMUM positive number that can be stored in a 6 bit register? [2]

                            _____

             In binary   *In Decimal*

    b. What is the RANGE of binary numbers which could be stored in a 6 bit register? [2]

          From _____ to _____.

    c. Convert the following binary numbers to decimal. Each number is stored in a different format. [6]

         i.   101101 (Unsigned)   _____

         ii.   100010 (Sign and Magnitude)   _____

         iii.   111010 (Two's Complement)   _____

Space for working:

7. This question is on System Analysis. **[13 marks]**

    a. What is system analysis and why is it necessary? [3]

      _____

      _____

      _____

    b. Briefly outline 1 operation that takes place at each of these steps in the system life-cycle: [3]

         i.   Feasibility study

            _____

         ii.   Testing

            _____

         iii.   Changeover method

            _____

c. Put the following system developing tasks in order (1 – 7): [7]

Task	Order number
Design the new system.	
Install a new system.	
Implement and test system.	
Problem definition of the new system.	
Identify user requirements.	
Check feasibility of system proposed.	
Collect data and analyze existing system.	

8. This question is on JAVA programming. [14 marks]

a. Write only one line of Java code to do the following tasks:

i. Create a class with the name Exam.

_____

ii. Write the sentence 'This is the Half Yearly Exam' on the screen.

_____

iii. Write a comment 'This is a blank line'.

_____

iv. Declare a variable of type integer with the name of num1.

_____

v. Add two variables num1 and num2 and store the answer in variable total.

_____

vi. Declare a constant of type double with the name PI and store in it 3.142.

_____

vii. Store n in m and then add 1 to n.

_____

END OF EXAM