

KULLEGG SAN BENEDITTU Secondary School, Kirkop

Mark

HALF YEARLY EXAMINATION – 2015/2016

Level 5 – 6 – 7 – 8

Form 4

COMPUTING

TIME: 1h 30min

Question	1	2	3	4	5	6	7	8	Global Mark
Max. Mark	5	12	15	8	15	15	15	15	100
Mark									

Instructions to students:

Answer **ALL** questions.

Calculators are **NOT** allowed; Good English and orderly presentation are important.

Read each question carefully.

DO NOT WRITE ABOVE THIS LINE

Name: _____

Class: _____

1. Fill in the blanks with **SOME** of these words.

[5 marks]

int

binary

source

double

executable

ROM

decimal

RAM

- a. The code written by the programmer.
- b. A primitive data type used in Java to represent whole numbers.
- c. The number system made up of 0s and 1s.
- d. The code understood by the computer.
- e. A temporary computer storage.

2. This question is on Computer Logic**[12 marks]**

Convert the following numbers and write your answers in the table below.

Binary	Decimal	Hexadecimal
10110101		
	74	
		F8

Show your working below. You can use any method you want.

<i>Convert 10110101 to Decimal</i>	<i>Convert 10110101 to Hexadecimal</i>
<i>Convert 74 to Binary</i>	<i>Convert 74 to Hexadecimal</i>
<i>Convert F8 to Binary</i>	<i>Convert F8 to Decimal</i>

3. This question is on Logic Circuits.

[15 marks]

a. Complete the following truth tables.

[3]

NOT gate

Input A	Output C
0	
1	

AND gate

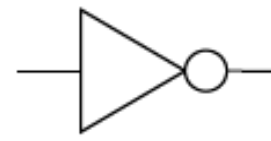
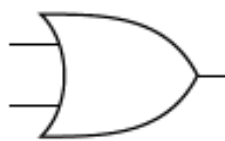
Input A	Input B	Output C
0	0	
0	1	
1	0	
1	1	

OR gate

Input A	Input B	Output C
0	0	
0	1	
1	0	
1	1	

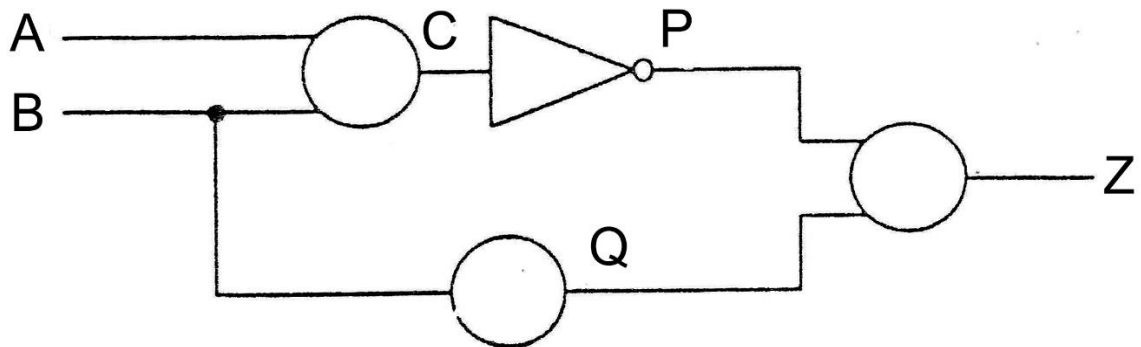
b. Write the name of the gate in the space provided.

[3]



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c. Below is a partly drawn logic circuit and its incomplete truth table.



A	B	C	P	Q	Z
0	0				
0	1	1	0	0	
1	0		0	1	0
1	1				

Logic 1 = True

Logic 0 = False

i. By examining the logic circuit and the truth table, find out what type of gates are represented by the circles. Write the names of the gates in the circles above.

[3]

ii. Complete the truth table so that it matches the logic circuit.

[2]

- iii. Complete the following logic statement to express the function of the logic circuit in terms of inputs A and B. [1]

The output Z is true when _____

- iv. Using only TWO gates from the three different types used in the circuit, draw another logic circuit which performs the same logic function. [3]

4. This question is on Character Coding Systems.

[8 marks]

- a. A coding scheme for numbers 0 to 9 and the characters A to Z has the following bit pattern:

		<i>Bit Pattern</i>							
0	.....	0	0	0	0	0	0	0	0
1	.....	0	0	0	0	0	0	0	1
2	.....	0	0	0	0	0	0	1	0
9	.....	0	0	0	0	1	0	0	1
A	.....	0	1	0	0	0	0	0	1
B	.....	0	1	0	0	0	0	1	0
Z	.....	0	1	0	1	1	0	1	0

- i. What is the bit pattern for number 3? _____ [1]
- ii. What is the bit pattern for character C? _____ [1]
- b. What do you understand by the term ASCII? [2]

- c. Fill in the space with a missing word. [1]

_____ was a brave effort to create a single character set that included every reasonable writing system on the planet. It uses 16 bits.

- d. A computer has a character set consisting of the capital letters A to Z (26 characters), the small letters a to z (26 characters) and the digits 0 to 9 (10 digits). What is the minimum number of bits required to represent this character set on this computer? *Show your working in the space below.* [3]

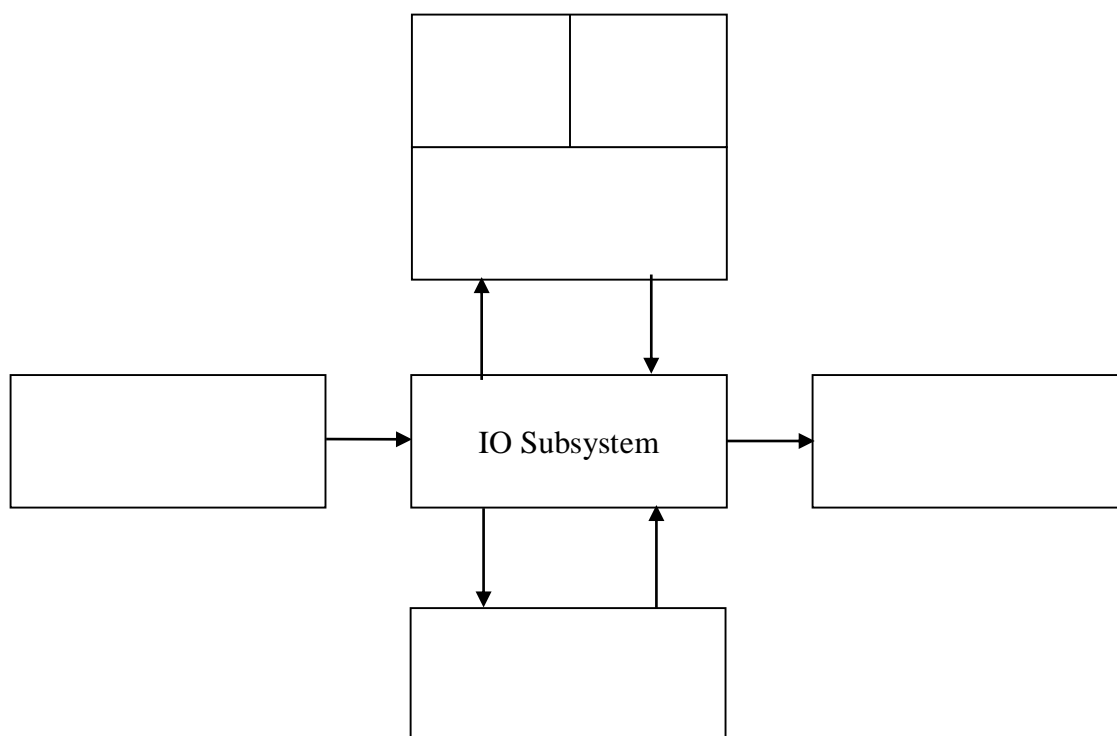
5. This question is on the CPU.

[15 marks]

- a. Label the diagram below by using the following keywords:

[3]

<i>Input</i>	<i>CU</i>	<i>Backing storage</i>
<i>Output</i>	<i>ALU</i>	<i>Main memory</i>



- b. What do these acronyms stand for?

[2]

ALU		IR	
CU		PC	

c. Use TEN of the following terms to complete the passage below: [5]

CPU
registers
disk
keyboard
opcode

counter
address
operands
executed
accumulator

fetch-execute
machine code
ALU
data
instruction

A _____ instruction is made up of an _____ specifying the operation to be performed by the _____, followed by zero or more _____, specifying the data on which the operation is to be performed. At the beginning of a _____ cycle, the CPU places the contents of the Program _____ on the _____ bus and receives the next instruction over the _____ bus. The instruction is stored in the _____ register while it is being decoded and _____.

d. What is a register? [1]

e. Name a register which is found in the ALU. _____ [1]

f. What is the function of this register found in the ALU? [1]

g. Name a register which is found in the CU. _____ [1]

h. What is the function of this register found in the CU? [1]

6. This question is on Registers.

[15 Marks]

- a. Explain why internal code representations are binary based. [1]

- b. Using an 8 bit number format, show how the number -100 is stored using
i. Sign and Magnitude [2]

- ii. 2s complement numeric representation [2]

- c. A computer uses 8 bit two's complement numbers. In the space below fill in the largest **POSITIVE** binary number that can be represented in this computer. [1]

--	--	--	--	--	--	--	--

- d. Give the value to base 10 of the binary number you wrote in 6c. [2]

- e. In the space below fill in the largest **NEGATIVE** binary number that can be represented in this computer. [1]

--	--	--	--	--	--	--	--

- f. Give the value to base 10 of the binary number you wrote in 6e. [2]

- g. Show how an 8 bit computer using two's complement arithmetic calculates 37-121 (base 10) and gets -84 (base 10) as an answer. [4]

7. This question is about the System Life Cycle.

[15 marks]

a. Underline the correct answer. The system life cycle is the... [1]

- i. *basic operation cycle of a computer*
- ii. *process for planning, creating, testing and deploying a system*
- iii. *person in charge of the system analysis*

b. Put the following system development tasks in order (1 - 7) [7]

System Development Stage	Order number
Programming and documentation	
System maintenance	
Project selection and feasibility study	
Control and review	
Present system study and analysis	
Implementation and changeover methods	
Design of the new computerized system	

c. In which **system development stage** do the following occur? (Refer to 7b) [7]

- i. The system is checked carefully for program errors

- ii. The new system is being coded

- iii. The new system is installed

- iv. Benefits and costs of the new system are studied

- v. Data on the manual system is collected

- vi. People are trained to use the new system

- vii. Check hardware to make sure it is working correctly

8. This question is about the Java Programming Language.

[15 marks]

- a. Look carefully at the program below and answer the following questions. [6]

```
1 //import java.util.*;
2
3 public class Part1_2 {
4
5     public static void main (String args[]){
6
7         //Scanner s = new Scanner(System.in);
8
9         float km, liters;
10        double kpl;
11
12        System.out.print("Enter amount of KM driven: ");
13        km = Keyboard.readFloat();
14        System.out.print("Enter amount of Liters of petrol used: ");
15        liters = Keyboard.readFloat();
16        //km = s.nextFloat();
17
18        kpl = (double) (km / liters);
19
20        System.out.printf("Your car KM per Liter = %.2f\n", kpl);
21
22    }
23
24
25 }
```

- i. What is the name of the class?

- ii. What is line 5 representing?

- iii. Write down the TWO data types that are used in this class.

- iv. Write down TWO variables that are used in this class.

- v. Which line/s show an OUTPUT statement?

- vi. Which line/s show COMMENTS (INLINE DOCUMENTATION)?

- b. Write snippets of Java code to carry out each of the following:

[4]

- i. Increase the value of variable A by 1

- ii. Display the name *Monica Bonello* by using two lines of code

- [5]

[illegible]