

# KULLEĠĠ SAN BENEDITTU

## Boys' Secondary, Kirkop

Mark

### HALF-YEARLY EXAMINATION – 2012/2013

Track 2 (AS)



FORM 4

COMPUTING

TIME: 1h 30min

Question	1	2	3	4	5	6	7	8	9	Global Mark
Max. Mark	8	12	7	12	2	18	22	3	16	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. This question covers various topics covered in Computing. Fill in each of the following statements with a suitable word from the ones listed below. [8 marks]

<b>Server</b>	<b>Microsoft Access</b>	<b>Plotter</b>	<b>Touch Pad</b>
<b>Backup</b>	<b>Machine Code</b>	<b>J Creator</b>	<b>Binary</b>
<b>DVD</b>	<b>File Transfer Protocol</b>	<b>Byte</b>	<b>Touch Screen</b>
<b>Query</b>	<b>Soft Copy</b>	<b>Vector Image</b>	<b>Hard disk</b>

	Answer
a. Application software which is used to create a database.	
b. The term used for uploading and downloading files from the Internet.	

c. The number system used in computing, made up of 1s and 0s only.	
d. This is the 3 <sup>rd</sup> fastest computer and can be used in schools.	
e. A storage device with direct file access.	
f. Hardware used to produce drawings on very large printing paper.	
g. The computer version of a hard copy.	
h. The code understood by the computer.	
i. The process of copying files from the hard disk to a secondary storage device.	
j. Second smallest unit of storage, made up of 8 binary digits.	
k. A database object used to extract information from a database by entering different criteria.	
l. A storage device storing up to 4.7 GB.	
m. An input device found on laptops and used instead of a mouse.	
n. The name of the editor used to create java programs.	
o. An image made up of points, lines, shapes and curves.	
p. An input and output device used in supermarkets or restaurants.	

2. This question is on Computer Logic. Convert the following:

[12 marks]

Show all your working and answers.

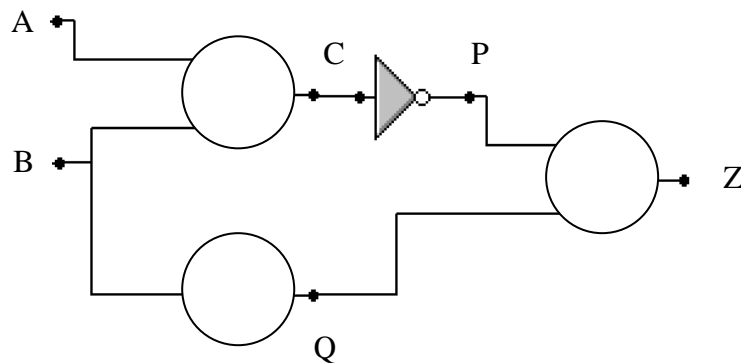
Binary	Decimal	Hexadecimal
1100 1100		
		EB
	186	

Space for working

### 3. This question is on Logic Gates.

[7 marks]

The figure below shows a logic circuit with three circles representing three logic gates. Following is the circuit's incomplete truth table.



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

- Using the above circuit and truth table, identify and write down the names of the three missing logic gates in the circle. Write down **AND**, **OR** or **NOT**. [3]
- Complete the truth table to show the output **Z**. [4]

### 4. This question is on Systems Analysis.

[12 marks]

- What do you understand by the term **System Life Cycle**? [2]

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- Name **one** method that can be used to study the present system. [1]

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c. **Who am I?** Use one of the following **job roles** which best describes my role. [2]

<b><i>Systems programmer</i></b>	<b><i>Systems designer</i></b>	<b><i>Systems analyst</i></b>
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i. I am responsible for the system life cycle. \_\_\_\_\_

ii. I develop the system software. \_\_\_\_\_

d. Match the following stages of Systems Analysis with the task which clearly describes what happens at that stage. [7]

Stage
1. Project selection and feasibility study
2. Present system study and analysis
3. Design of new system
4. Programming
5. Implementation and changeover
6. Control and review
7. System maintenance

Task
Drawing the flowcharts to solve the problem
Installing the new system
Get to know what is the problem with the present system
Update the new system
Check that the new system is working as it should
Find out more about the current system and determine user requirements
Create programs from flowcharts

5. This question is on the number of symbols represented by a given number of bits. [2 marks]

How many bits are required to send all the following characters in binary code ( a, b, c, d.....x, y, z, A, B, C, D.....X, Y, Z, 0, 1, 2 ..... 8, 9, +, -, /, \* )? [2]

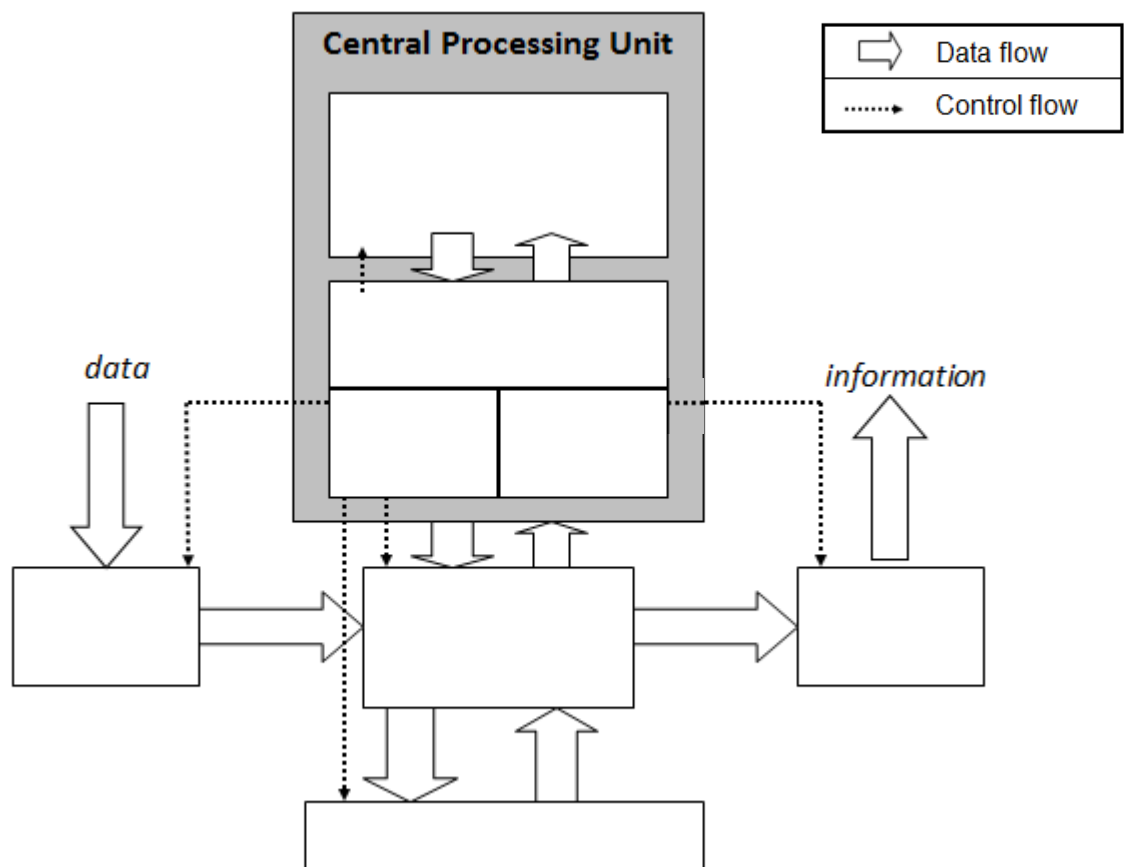
\_\_\_\_\_

6. This question is about the CPU.

[18 marks]

- a. Below is an incomplete hardware block diagram. Label each component using the following keywords. [4]

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



- b. What do these **acronyms** stand for? [2]

- i. **ALU** - \_\_\_\_\_
- ii. **CU** - \_\_\_\_\_

- c. Match each of the following three system buses with their appropriate definition. [3]

1. Data bus		Carries the address of the memory location on which operations are to be carried out.
2. Address bus		Carries the signal which determines whether a read or write operations is to be carried out.
3. Control bus		Moves the actual data and instructions between the processor, memory and devices.

d. Which of the above buses affects: [2]

i. the addressable space - \_\_\_\_\_

ii. the word length - \_\_\_\_\_

e. Alan needs to buy a new computer. There are two models which are almost identical, however, one has a 16-bit CPU and the other has a 32-bit CPU.

i. What does the **16-bit** refer to? [1]

\_\_\_\_\_

ii. Which model would you suggest that he buys and why? [2]

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

f. Put the following fetch execute cycle steps in order (1 – 6). The first and last steps have been done for you: [4]

Task	Order number
Control unit places opcode in IR.	
Control unit fetches any required operand.	
Control unit fetches the opcode from the memory location indicated by the PC.	<b>1</b>
Control unit activates necessary circuits to execute the instruction.	
Go back to step 1.	<b>6</b>
Control unit increments the PC to point to the next instruction.	

7. This question is about Computer Registers.

[22 marks]

a. What are **registers**?

[2]

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b. Which register am I?

[4]

<i><b>Accumulator</b></i>	<i><b>Shift register</b></i>	<i><b>Instruction Register</b></i>	<i><b>Program Counter</b></i>
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i.	I hold the address of the next instruction to be executed.	
ii.	I shift bits to the left or to the right to carry out mathematical operations.	
iii.	I store mathematical and logical results.	
iv.	I hold the instructions currently being used.	

c. Assume a computer uses a **6-bit unsigned** number system.

(Make sure that you show all of your working in the questions below.)

i. What is the **smallest positive number** that can be stored in this 6-bit register? Give your answer both in binary **and** as a decimal number. [3]

**Binary :** \_\_\_\_\_

**Decimal:** \_\_\_\_\_

ii. What is the **largest positive number** that can be stored in this 6-bit register? Give your answer both in binary **and** as a decimal number. [3]

**Binary :** \_\_\_\_\_

**Decimal:** \_\_\_\_\_



- iii. What is the **range of unsigned numbers** that can be stored in this 6-bit register? Give your answer in decimal. [1]

**Range:** \_\_\_\_\_

- iv. How would the integer **10<sub>10</sub>**, be represented in this register? [2]

**Binary:** \_\_\_\_\_

- d. Now assume an **8-bit unsigned register** is used.

- i. How can the integer **12<sub>10</sub>** be represented? [2]

**Binary:** \_\_\_\_\_

- ii. Shift the result you got for (i) once to the **left**. [2]

**Binary:** \_\_\_\_\_

- iii. What effect does this shift operation have on the integer? [1]

\_\_\_\_\_

- iv. How many times **and** in which direction should the binary result in (i) be shifted to get **3<sub>10</sub>** as a result? [2]

**Direction :** \_\_\_\_\_

**Number of times:** \_\_\_\_\_

**8. This question is about Binary Operations.**

**[3 marks]**

- a. Add the following two 8-bit binary numbers: **10010110 + 10011101** [2]

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

- b. If the answer of the above sum is carried out in an 8-bit system, what kind of error will be generated? [1]

\_\_\_\_\_

**9. This question is about the Java Programming Language.**

**[16 marks]**

- a. Say whether the following are **True** (T) or **False** (F). [4]

- i. The float data type is used to store whole numbers.
- ii. Java is an object-oriented language.
- iii. The byte data type can hold larger values than the short data type.
- iv. 'integer' is considered to be a java keyword.


- b. Answer the questions below.

- i. How would you assign the number 10 to a variable of name 'students'? [1]

\_\_\_\_\_

- ii. Write a line of code to output on the screen: '**I am enjoying this exam**'. [1]

\_\_\_\_\_

- iii. How is the **main method** in Java declared? [1]

\_\_\_\_\_

- iv. What is the difference between a **variable** and a **constant**? [2]

\_\_\_\_\_

\_\_\_\_\_

- c. Write a main method to display the data below on the output screen. You should use **escape characters** to answer the question. [7]

	English	Maths
Tony	98	55
Joe	65	70

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**END OF EXAM**