

# KULLEGG SAN BENEDITTU Secondary School, Kirkop

Mark

## HALF YEARLY EXAMINATION – 2014/2015

Level 5 – 6 – 7 - 8

Form 4

COMPUTING

TIME: 1h 30min

Question	1	2	3	4	5	6	7	8	9	Global Mark
Max. Mark	8	5	7	10	8	12	13	16	21	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. Say whether the following statements are True (T) or False (F). [8 marks]

- A touch-screen is both an input and an output device.
- The Boolean Expression for an And Gate is  $X = A + B$ .
- ASCII is an 8-bit character coding system.
- ADD** is an example of a mnemonic.
- The System Administrator is the person in charge of the System Life cycle.
- In SAM there is a positive and a negative zero.
- The NOT gate inverts all inputs.
- The output of an AND gate is 1 when both of its inputs are 0.


2. The following are a number of Computing-related acronyms. What do they stand for? [5 marks]

a. ALU	
b. CU	
c. IR	
d. PC	
e. CPU	

3. Fill in the blanks with the appropriate terms. [7 marks]

motherboard	control unit	gigahertz	buses
clock speed	cache	arithmetic logic unit	

The CPU is located on the \_\_\_\_\_ and is normally described as the brain of the computer. A typical CPU has a number of components. The first is the \_\_\_\_\_ which performs simple arithmetic and logical operations. Second is the \_\_\_\_\_ which manages the various components of the computer. Third is the \_\_\_\_\_, which is a high-speed memory where instructions can be copied to and retrieved. The CPU speed is normally measured in \_\_\_\_\_ and it is determined by a number of factors like the \_\_\_\_\_ and the \_\_\_\_\_.

4. Write the difference between the following: [10 marks]

a. **Data bus** and **Address Bus**

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b. **High-level language** and **Low-level language**

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c. **opcode** and **operand**

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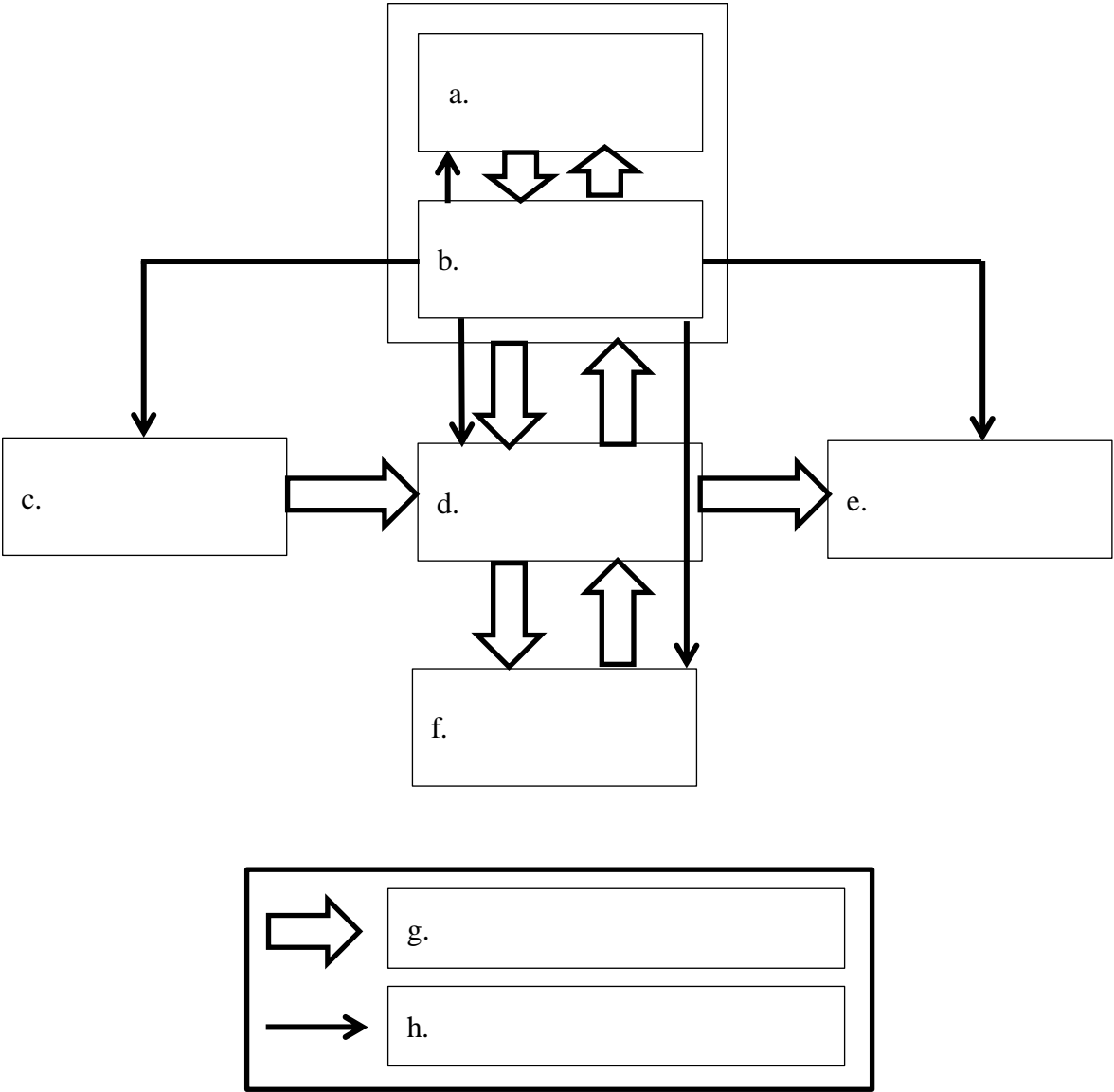
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d. **arithmetic shift left** and **arithmetic shift right**

e. **PC** and **IR**

5. Label the diagram below by using the following keywords: [8 marks]

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



**6. Answer the following questions about the CPU and registers.**

[12 marks]

a. What is the **word length**? [1]

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b. Which **bus** affects the word length? [1]

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c. What is the **addressable space**? [1]

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d. Which **bus** affects the addressable space? [1]

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e. What is the role of the **control bus**? [1]

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f. Oliver decides to buy a computer with **64-bit** CPU instead of the **32-bit** alternative. Explain why he made a wise choice. [1]

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g. Mention **two** registers we find inside the CU. [2]

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h. Mention **two** registers found inside the ALU. [2]

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i. A computer with a 32-bit address bus would be faster than one with a 16-bit address bus. Is this True or False? Explain. [2]

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**7. The following are the 7 stages of the System Life Cycle.**

[13 marks]

a. Put the following steps in order.

[5]

Implementation & Changeover Methods	5
Project Selection & Feasibility Study	
Present System Study & Analysis	
Control & Review	
Design of New Computerised System	
System Maintenance	7
Programming & Documentation	

b. The following are the four different types of changeover methods which can be used in Step 5. Briefly explain each changeover method. [4]

1. Direct changeover

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2. Parallel changeover

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3. Phased changeover

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4. Pilot-run

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- c. The last stage involves the maintenance of the software system. There are three types of maintenance which can be carried out. List two such maintenance practices. The first one has been done for you. [4]

**1. Perfective Maintenance**

Involves further improvements even though the system runs well.

2. **A** \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

3. **C** \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

**8. Assume an 8-bit register to work out the questions below. Make sure that you show all of your working.** [16 marks]

- i. Convert the number  $73_{10}$  to binary using **two's complement**. [2]

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

- ii. Convert the number  $-55_{10}$  to binary using **two's complement**. [2]

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

- iii. **Use the above results** to help you subtract 55 from 73. [2]  
(Calculations using decimal numbers will not be awarded any marks)

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

- iv. Convert the number  $-23_{10}$  to binary using **Sign-and-Magnitude**. [2]

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

- v. What is the range of numbers that can be represented in this register using:  
*Give your answers in decimal*

- i. Two's complement form [2]  
ii. Sign-and-magnitude form [2]

**Range in two's complement:** \_\_\_\_\_

**Range in sign-and-magnitude:** \_\_\_\_\_

- vi. Add up the **unsigned numbers**  $255_{10}$  and  $23_{10}$  by first converting them to binary. [3]

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

- vii. What can you say about the result in question (vi)? [1]

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**9. This question is about the Java Programming Language.** [25 marks]

- a. Fill in the blanks with the proper term. [8]

Sequence	Iteration	Object	Build
portability	source	Selection	Third

A program is a set of instructions which tell the computer what to do. The three programming pillars are \_\_\_\_\_, \_\_\_\_\_ and \_\_\_\_\_. Java is an example of an \_\_\_\_\_ - oriented language. It is a \_\_\_\_\_ generation language. In Java we type the \_\_\_\_\_ code which is then translated by the compiler when we click on the \_\_\_\_\_ button in JCreator. One of the biggest benefits of Java is its \_\_\_\_\_ which means that it can be run on a number of different platforms.

- b. On the next page, write snippets of Java code to carry out the tasks below: [6]
- i. Declaring the main method; [1]
  - ii. Outputting the sentence *Please choose an option* on the screen and moving the cursor to the next line; [1]
  - iii. Displaying the name *Albert Fenech* by using two lines of code; [1]
  - iv. Assigning the value 45 to an integer variable called *number*; [1]
  - v. Declaring the variable *name* of type String; [1]
  - vi. Adding two integer numbers stored in *num1* and *num2* and storing their result in the variable *total* [1]



i	
ii	
iii	
iv	
v	
vi	

c. Write a Java program which displays the following output on the screen. [7]

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Welcome! Please enter your selection"
Main Menu      1
Product List   2
Supplier List   3
Quit           4
  
```

**END OF EXAM**