DIRECTORATE FOR QUALITY AND STANDARDS IN EDUCATION
Department Curriculum Management
Educational Assessment Unit

Annual Examinations for Secondary Schools 2014

FORM 4 COMPUTING TIME: 1h 30min

Name: _____________________________ Class: _____________

Directions to Candidates:

Answer ALL questions in Section A and Section B on this paper;
The use of flow chart template is permitted;
Calculators are NOT allowed;

Good English and orderly presentation are important.

For office use only:

<table>
<thead>
<tr>
<th>Question</th>
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<th>13</th>
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<th>Course Work</th>
<th>Final Mark</th>
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Computing – Form 4 Secondary – Track 2 – 2014
Section A – Answer all Questions

1. The CPU processes binary numbers.
   a. Given an **8-bit register**, how would you represent $56_{10}$ in binary? [2]

   Answer __________________

   b. Fill in with one of the following terms: [3]

   | i. A hardware item capable of decision making. |
   | ii. A small temporary unit of storage inside the CPU. |
   | iii. A CPU register that holds the instruction currently being executed. |

2. Logic circuits are designed to carry out specific functions.
   a. Name a Logic Gate that: [2]

      | i. Outputs a 1 only of both inputs are 1. |
      | ii. Is an inverter gate. |

   b. Complete the truth table for the logic circuit shown below: [3]

   ![Logic Circuit Diagram]

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
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</table>
3. The diagram below shows various system components.
   a. **Label** the following system components.

   
   ![Diagram](image)

   ALU, CU, Main Memory

   b. What do the following acronyms stand for?

   
   ALU ________________________________________________________________________

   CU ________________________________________________________________________

   c. Name the **bus** that carries data between the CPU and Main Memory.

   ____________________________________________________________________________

4. There are various steps in the system lifecycle.
   a. State **two** things that are normally done during the system design stage of the system lifecycle.

   i. ________________________________________________________________________

   ii. ________________________________________________________________________

   b. What is **system changeover**?

   ___________________________________________________________________________

   c. Give **one** advantage of the following changeover methods:

   i. Parallel changeover

   ___________________________________________________________________________

   ii. Direct changeover

   ___________________________________________________________________________
5. System testing is an important step in the system lifecycle.
   a. Give the term for:
      i. Checking a program by working through a section of it manually.  
      ii. An error in a program.
      iii. An error in the use of the syntactical rules of a language.

b. Look carefully at the following section of code:
   ```java
   average = num1 + num2/total;
   System.out.println ('The average is' + average);
   ```
   i. Identify a logic error in this code.
   ii. Rewrite this code so as to fix the logical error mentioned in (ci).

   a. An 8-bit register holds the binary pattern 01000001.
      i. What will be the value stored in this register after an Arithmetic Shift Left?
      ii. What does an Arithmetic Shift Left do to a number?
   b. How many different unsigned numbers can be represented by an 8-bit register?
   c. If in a character coding system ‘A’ is represented by binary 65, give the binary equivalent of ‘F’.

7. a. Which of the following is System Software and which Application Software?
<table>
<thead>
<tr>
<th>Wordprocessor</th>
<th>Operating System</th>
</tr>
</thead>
</table>
   b. What application software could one use to keep track of business sales?
c. Give two differences between tailor-made and off-the-shelf packages. [2]

<table>
<thead>
<tr>
<th>Tailor made packages</th>
<th>Off-the-shelf packages</th>
</tr>
</thead>
<tbody>
<tr>
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8. Java is an Object Oriented Language.
   a. Answer True or False. [3]
   i. An object is an instance of a class.
   ii. A class is a blueprint for an object.
   iii. A programmer should not declare more than one instance for a given class.

   b. Write a line in Java to declare and create an instance called ‘personA’ of a class called ‘Person’. [2]

9. This question is about Software Documentation.
   a. Name two things you expect to find in program documentation. [2]
      i. __________________________ ________________________________
      ii. __________________________ ________________________________
   b. Give two reasons why such program documentation is important. [2]
      i. __________________________ ________________________________
      ii. __________________________ ________________________________
   c. What is a user manual? [1]

10. CPU evolution has been a long struggle to improve its efficiency.
    a. Give the term for each of the following: [3]
       i. An electronic timer that synchronises CPU components
       ii. The number of bits the CPU can send, receive or process at a time
       iii. Very fast, volatile memory that is immediately accessible to the CPU
    b. What is address space? [1]

    c. What is the address space of a 16-bit address bus? [1]
11. Registers are limited to storing a certain range of values.
   a. What is the range of unsigned numbers that can be stored in an 8-bit register? [2]

   Answer __________________

   b. Use 8-bit binary to add 34 and 244. [2]

   Answer __________________

   c. If the result of your calculation in (b) was to be stored in an 8-bit register, what type of error would it generate? [1]

Section B

12. Computers have various applications in society.
   a. What do the following abbreviations stand for? [3]

   i. CAD
   ii. CAM
   iii. GPS

   b. Give an example of where a CAD CAM system can be used and briefly explain your answer. [2]

   Where CAD CAM can be used
   Explanation

   A Virtual Learning Environment (VLE) (like Fronter) can be a useful CAL tool. A VLE is an online facility that allows teachers to share resources with students. They also allow students to submit their work online and receive teacher feedback, results and school reports. The system can be accessed by students, parents, teachers and members of the administration who have a login name and password.

   Recommend one way in which a VLE can be useful in helping improve students’ performance.
   i. ________________________________

   Suggest one way in which a VLE can be useful in helping improve students’ performance.
   i. ________________________________
d. Name one use of computers in the following fields:

   i. Medical diagnosis
   ii. Office Automation
   iii. Business
   iv. Aviation
   v. Ecology
   vi. School Administration


e. What does EFTPOS stand for?

f. Explain one way EFTPOS is advantageous:

   i. To the shop
   ii. To the customer

13. Below is an incomplete Java class called Student.

   ```java
   public class Student {
      String name;
      String surname;
      int totalExamMark;
      __________________________; //array to hold 10 marks

      public void findHighest(){
         int h = ________;
         int i; //counter
         for (________________________){
            if (______________________){
               h = markList[i];
            }
         }
         System.out.println("The highest mark is: "+h);
      }
   }
   ```

   a. Write a line to declare the array called markList to hold a total of 10 whole marks.
b. Complete the method `findHighest` such that it outputs the highest mark in the array `markList`.

```java
public void findHighest(){
    int h = ________;
    int i;
    for (___________________________){
        if (_______________________){
            h = markList[i];
        }
    }
    System.out.println("The highest mark is: " + h);
}
```

c. Write a method called `findAverage()` that finds and outputs the average of the marks in `markList`.

```
Space for your code
```

d. Answer True or False.

| i.  | The for loop is a predetermined loop |
| i.  | The while loop is executed at least once |
| iii. | The do...while loop is a predetermined loop |

i. In Java the following variable types are all used for whole numbers: **int, short, byte, long**

| i.  | Which of these variable types has the smallest range? |
| ii. | Why is it important not to use larger variable types than necessary when writing a program? |
Term options to include also: 
Program Counter, Instruction Register