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

Annual Examinations for Secondary Schools 2015

| **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:

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	Paper Total	Course Work	Final Mark
Max	5	5	5	5	5	5	5	5	5	5	5	15	15	85%	15%	100%
Mark																

Section A

1.   Computers have various uses in society.

    a.   What do the following stand for?   [2]

i.	CAD	
ii.	CAM	

    b.   Give one use for: [2]

i.	CAD	
ii.	CAM	

    c.   Suggest and **briefly explain** one advantage of CAM.   [1]

    _____

    _____

2.   This question is about loops in Java.

    a.   **Tick** as appropriate.   [3]

		For loop	While loop	Do..while loop
i.	The code in this type of loop will be executed a predetermined number of times.			
ii.	A conditional loop that will be executed zero or more times.			
iii.	A conditional loop where the looping condition is checked after the loop is executed.			

    b.   Complete the code below such as to declare a for loop that will execute **ten** times. [2]

```
for ( int i = 0;  _____; _____){


}
```

3. Many teenagers find computers a useful tool in doing research work.

    a. What does **CAL** stand for?   [1]

        _____

    b. Name **two** educational uses of computers other than for research.   [2]

        i.   _____

        ii. _____

    c. Fill in the blanks using one of the following: [2]

GPS,   *EFT,*   *WWW,*   *computer process control*

        i.   _____ allows one to pay bills online.

        ii. _____ is used in Anti-Lock-Braking systems in cars.

4. Program Testing is an important step of the system lifecycle.

    a. A program runs but consistently gives an incorrect result.

        i.   The cause is likely to be a (syntax error, logic error).   [1]

        ii. Explain your answer to (i) by explaining the difference between **syntax** and   [2]
             logic errors.

             _____

             _____

    b. A third type of programming error is called a 'runtime error'.

        i.   What is a **runtime error**?   [1]

             _____

        ii. Give an **example** of where a runtime error can occur.   [1]

             _____

5. You have just bought a new computer game.

    a. Name **three** things you expect to find in its User Manual.   [3]

        i.   _____

        ii.   _____

        iii. _____

b. Name **two** things that are commonly done during the installation of the game. [2]

    i. _____

    ii. _____

6. The System lifecycle involves the various steps in the creation and maintenance of a computer system.

a. Why is **System Analysis** an important step in the development of a new system? [1]

_____

b. One step of the System Lifecycle involves an in-depth analysis of the new system. Once this analysis is complete, name and briefly describe the step that needs to be done before the system is coded.

Name		[1]
Description		[1]

c. Briefly explain why a bank might opt for a **parallel** rather than a direct changeover. [1]

_____

d. Name one possible issue one might raise **against** a parallel changeover. [1]

_____

7. Data and control information are carried within the CPU on buses.

a. Distinguish between the **Data Bus** and the **Address Bus**. [2]

_____

b. What is the **address space** of a system with a 32-bit Address Bus? [1]

_____

c. How is a system with a 64-bit Address Bus superior to one with a 32-bit Address Bus? [2]

_____

_____

8. **Fill in** the blanks with one of the following terms: [5]

| *less, off-the-shelf, freeware, less, tailor-made, shareware, more, single-user, site* |

a. A company will often choose to buy _____ software because this is readily available and generally _____ expensive.

b. However sometimes a company may require _____ software because there would be no existing software on the market that meets its needs.

c. Software may have a _____ licence that means the software may be installed on all systems in a particular establishment.

d. _____ is software that can be freely tested often for a given time period, but which the user would need to pay for if s/he wants full functionality or to continue using it long term.

9. Computers deal with binary numbers.

a. Express 64 in 8-bit unsinged binary. [1]

Answer _____

b. Express -64 in 8-bit Two's complement. [1]

Answer _____

c. Work out 90 – 64 in 8-bit Two's Complement. [3]

Answer _____

10. ASCII is a 7-bit coding system while Unicode is a 16-bit coding system.

    a. What is a coding system?   [1]

    _____

    b. How many different characters can each of the above coding systems represent?   [2]

       i. ASCII

       _____

      ii. Unicode

       _____

    c. Hence explain why Unicode is generally preferred.   [1]

    _____

    d. If 65 represents the letter **A**, what letter does 71 represent?   [1]

    _____

11. The CPU is at the heart of a computer system.

    a. What is a CPU register?   [1]

    _____

    b. What is the role of the ALU?   [1]

    _____

    c. How is the accumulator register related to this role?   [1]

    _____

    d. Which CPU register is responsible for holding the address of the next instruction to be executed?   [1]

    _____

    e. Briefly explain the role of the Instruction Register.   [1]

    _____

Section B

12. Logic gates are central to a computer system.

    a. Answer **True** or **False**.   [3]

i.	A logic gate is a hardware item.	
ii.	The AND gate is an inverter gate.	
iii.	A logic circuit can have one or more inputs.	

    b. Give the truth table and boolean expression for an OR gate.   [3]

    Truth Table

A	B	X

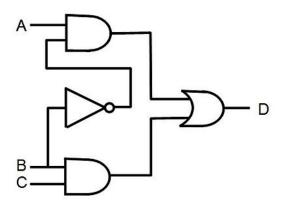   **Boolean expression** _____   [1]

    c. Give the boolean expression and truth table for the logic circuit shown below:

    Boolean expression   [3]

    Answer _____

Truth Table   [4]

A	B	C	B'	A.B'	B.C	D
0	0	0				
0	0	1				
0	1	0				
0	1	1				
1	0	0				
1	0	1				
1	1	0				
1	1	1				

d.   Name one use of logic circuits in computing.   [1]

_____

13.   Java is an object-oriented language.

a.   Match the following with their possible output below by ticking as appropriate: [3]

   A: Name: Jane

   B: Jane

   C: Name:Jane

		A	B	C
i.	System.out.println (name);			
ii.	System.out.println ("Name:" + name);			
iii.	System.out.println ("Name:\t" + name);			

b.   An application is being written to handle patient records in a diabetes clinic. The application includes a class called 'Patient'.

   i.   Two of the properties of class Patient are: 'name' and 'yearOfBirth'.   [2]
        Show how you would declare each of these properties:

   _____

   _____

ii. Class Patient includes a method called outputAge() that calculates and [4]
outputs each patient's age (in 2015). This method should also output
'Junior' for patients under 18 years of age and 'Adult' for those 18 years
and over.

Write the method outputAge() in the space below.

c. The class Patient also includes a property that holds an array (called readingList) [3]
of the last 10 readings of the patient's glucose level. The reading is stored as a
real number.

i. Show how you would declare and assign the array readingList. [2]

ii. Write a line to output the last reading on the screen. [1]