Christ Church Grammar School

Computer Science Department
Year 11 Computer Science

Name: _____

Year 11 ATAR Computer Science
In-Class Theory Test

Programming

3rd April, 2023

Time allowed for this paper
Working time for paper: forty-five (45) minutes

Materials required/recommended for this paper
To be provided by the supervisor
This Question/Answer Booklet

To be provided by the candidate
Standard items: pens (blue/black preferred), pencils (including coloured), sharpener, correction tape/fluid, eraser, ruler, highlighters

Special items: non-programmable calculators approved for use in this examination, Mathomat and/or Mathaid and/or any system flowchart template

TOTAL ____ / 57

Question 1 **(5 marks)**

Given A is True, B is False and C is True, evaluate the following Boolean expressions:

A AND B _____

A OR C _____

(A OR C) AND (A OR B) _____

NOT A AND C _____

(A AND B) OR (NOT A AND C) _____

Question 2 **(3 marks)**

Given A is 3, B is 4 and C is 5, evaluate the following expressions:

A == B _____

A != C _____

(A > C) OR (B < C) _____

Question 3 **(4 marks)**

Give an example of each of the following data types:

integer _____

string _____

Boolean _____

float _____

Question 4 (5 marks)

Consider the following algorithms and identify the **final** output from each algorithm.

```
num = 6
IF num > 0
        PRINT(num * 2)
ELSE IF num < 0:
        PRINT(num / 2)
ELSE
        PRINT(num)
END IF
```

Output: _____

```
n = 4
count = 1
sum = 0
WHILE count <= n
        sum = sum + (count * count)
        count += 1
END WHILE
PRINT(sum)
```

Output: _____

```
x = 5
y = 10
z = 0
IF x > y
        z = x - y
ELSE
        z = x + y
END IF
PRINT(z)
```

Output: _____

```
a = 10
b = 20
c = 30
d = 0
IF a > b AND a > c THEN
        d = a
ELSE IF b > a and b > c THEN
        d = b
ELSE
        d = c
END IF
PRINT(d)
```

Output: _____

```
a = “one”
b = “two”
c= “three”
c = a
b = a
a = c
PRINT(a, b, c)
```

Output: _____

Question 5 **(4 marks)**

Vikki is always looking to save money for her business by pirating software. Discuss two ethical considerations with her behaviour.

(i) _____

_____

_____

_____

_____

_____

(ii)_____

_____

_____

_____

_____

_____

Question 6 **(9 marks)**

(a) Identify and describe three types of coding errors that occur when programming. (6 marks)

Error 1: _____

Description: _____

_____

_____

_____

Error 2: _____

Description: _____

_____

_____

_____

_____

Error 3: _____

Description: _____

_____

_____

_____

_____

(b) Identify which type of error is usually the most difficult to find and fix. Justify your choice. (3 marks)

Error: _____

Justification: _____

_____

_____

_____

_____

_____

Question 7 (6 marks)

Ellyse loves words, and the longer the better! Help her find the longest word in her book by writing an algorithm.

Your algorithm should:

- Read in a list of words. The list could be of any length and the program should stop asking for a new word when the user enters an empty string
- Find the longest word in the list
- Print the longest word

MODULE LongestWord

END LongestWord

Question 8 **(4 marks)**

Jake is writing a program to calculate the amount of interest that he needs to pay on his home loan. Describe two reasons why it would be useful for him to use a constant called *interest_rate* in his program.

(i) _____

_____

_____

_____

_____

(ii) _____

_____

_____

_____

_____

Question 9 **(6 marks)**

Discuss three benefits of using modularisation when writing software.

(i) _____

_____

_____

_____

_____

(ii) _____

_____

_____

_____

_____

(iii) _____

_____

_____

_____

_____

Question 10 **(4 marks)**

Jake loves playing with numbers and wants some programs to help him learn more about them.

The first game he calls *Evens*. This game involves getting a list of numbers and finding the sum of all the even numbers in the list.

For example, given the list [3, 6, 4, 1, 2], the sum would be 12. Given the list [1, 2, 3, 4, 5, 6, 7, 8], the sum would be 20.

Complete the function *Evens* below that takes in a list of numbers, *numbers*, as a parameter and returns the sum of all the even numbers in the list.

```
FUNCTION Evens(numbers)
    _____
    _____
    _____
    _____
    _____
    _____
    _____
    _____
    _____
    _____
    _____
    _____
    RETURN sum
END EvenSum
```

Question 11 (7 marks)

Mr Farmer want so make sure students don't get too sunburnt during PE lessons but is having trouble reading the UV sensor on the gym wall from his office!

Write an algorithm called *UV_rating* that will ask the user to enter an integer that will represent the current UV level, and print out the UV rating based on the table below.

UV Level	Rating
1-2	Low
3-5	moderate
6-7	High
8-10	very high
11 and above	extreme

End of questions