THE UNIVERSITY OF AUCKLAND

FIRST SEMESTER, 2014
Campus: City

COMPUTER SCIENCE
Principles of Programming
(Time Allowed: One Hour)

SECTION A
MULTIPLE CHOICE QUESTIONS
For each question, choose the best answer according to the information presented in lectures. Select your preferred answer on the Teleform answer sheet by shading in the appropriate box.

Question 1
[3.75 marks] Given the following Python code, which one of the following statements best describes what happens to the values stored in the variables?

today = wednesday

(a) The statement moves the value of variable today into variable wednesday leaving the value of variable today empty.
(b) The statement moves the value of variable wednesday into variable today leaving the value of variable wednesday empty.
(c) The statement tests if today and wednesday contain the same value or not.
(d) The statement copies the value of variable today into variable wednesday leaving the value of variable today unchanged.
(e) The statement copies the value of variable wednesday into variable today leaving the value of variable wednesday unchanged.

Question 2
[3.75 marks] What are the values of girls, boys, and children after the following code has been executed?
girls = 0
boys = 0
children = 0
children = girls + boys
girls = 15
boys = 12

(a) 15, 12, 0
(b) 0, 0, 0
(c) 15, 12, 27
(d) 0, 0, 27
(e) 0, 0, 1512
Question 3
[3.75 marks] Assume that the Python variables dog, cat and rabbit have all been assigned integer values. Which one of the following would best describe the outcome of the following piece of code?

```python
rabbit = dog
cat = rabbit
dog = cat
```

(a) Each variable would store the same value (the initial value of rabbit).
(b) The values in variables rabbit and dog would be swapped.
(c) Each variable would store the same value (the initial value of dog).
(d) The values in variables cat and dog would be swapped.
(e) The values in variables rabbit and cat would be swapped.

Question 4
[3.75 marks] Assume there are two Python string variables, driver and navigator. Which one of the following blocks of code will swap the values stored in those variables?

```python
(a) temp = navigator
driver = temp
navigator = driver
(b) driver = navigator
navigator = temp
temp = driver
(c) temp = navigator
driver = navigator
navigator = temp
(d) temp = driver
driver = navigator
navigator = temp
(e) driver = navigator
navigator = driver
```

Question 5
[3.75 marks] What does the following code print to standard output?

```python
x = 0
x = x + 2
x = x + 4
x = x + 2
x = x + 0
print(x)
```

(a) 0
(b) 2
(c) 4
(d) 6
(e) 8

Question 6
[3.75 marks] What does the expression 8 + 8 / 2 * 4 evaluate to?

(a) 2.0
(b) 32.0
(c) 48.0
(d) 24.0
(e) 9.0

Question 7
[3.75 marks] What is the output of the following code?

```python
blue = 0
red = 3
green = 2
purple = 6
brown = 1
print((brown + red) * blue + purple - green)
```

(a) 4
(b) 16
(c) 22
(d) 5
(e) 8

Question 8
[3.75 marks] What does the expression 2 % 50 evaluate to?

(a) 25
(b) 4
(c) 2
(d) 100
(e) 50

Question 9
[3.75 marks] What does the expression 7 // 2 evaluate to?

(a) 2
(b) 3.5
(c) 1
(d) 7
(e) 3
Question 10
[3.75 marks] During labs, you experimented with the use of the `round()` function. Given what you learned in labs, what is the output from the following code?

```python
x = round(2.5)
y = round(3.5)
z = round(3.4)
print(x, y, z)
```

(a) 2 3 3
(b) 3 3 4
(c) 2 3 3
(d) 3 4 3
(e) 3 4 4

Question 11
[3.75 marks] Consider the Python code fragment below (with deliberately uninformative variable and function names).

```python
def mystery(riddle):
puzzle = 7
enigma = 5
conundrum = puzzle + riddle
return conundrum + enigma
```

Which one of the following function calls will evaluate to 20 when executed?

(a) `mystery(7 + 5 + 8)`
(b) `mystery(2)`
(c) `mystery(6 + 2)`
(d) `mystery(20)`
(e) `mystery(2 + 0)`

Question 12
[3.75 marks] What is the output of the following code?

```python
x = 23
result = 0
if x < 23:
    result = result + 1
elif x == 23:
    result = result + 2
elif x >= 23:
    result = result + 3
else:
    result = result + 4
print(result)
```

(a) 3
(b) 4
(c) 9
(d) 5
(e) 2

Question 13
[3.75 marks] The following code should store the value 'voting age' in `result` when `age` is at least 18. Which expression should be used as the condition in the place of `<expression>` in the following code?

```python
if <expression>:
    result = 'can’t vote yet'
else:
    result = 'voting age'
```

(a) `age = 18`
(b) `age <= 18`
(c) `age < 18`
(d) `age >= 18`
(e) `age > 18`

Question 14
[3.75 marks] Consider the following block of Python code:

```python
if num <= 0:
    print('A')
if num >= 10:
    print('B')
if num % 2 == 0:
    print('C')
```

Which of the following values for `num` would each cause 'C' (and no other letter) to be printed?

(a) When `num` is 2, 4, 6, or 8
(b) When `num` is 2, 4, 6, 8 or 10
(c) When `num` is 0, 2, 4, 6 or 8
(d) When `num` is 0, 2, 4, 6, 8 or 10
(e) When `num` is 0, 4, 6, 8, or 10

Question 15
[3.75 marks] What value for `age` would result in the message 'Half price' being printed when the following Python code is executed?

```python
if age <= 6:
    message = 'Free entry'
elif age < 10:
    message = 'Half price'
else:
    message = 'Full price'
print(message)
```

(a) When `age` is 15
(b) When `age` is 6
(c) When `age` is 7
(d) When `age` is 10
(e) When `age` is 4
Question 16
[3.75 marks] The following code determines the number of pizzas eaten by 10 people. What is the output of the code?

```python
people = 10
if people < 5:
    pizzas = people
elif people < 10:
    pizzas = 3 * people // 4
elif people < 15:
    pizzas = 2 * people // 3
else:
    pizzas = people // 2
print(pizzas)
```

(a) 10  
(b) 9  
(c) 7  
(d) 5  
(e) 6

Question 17
[3.75 marks] What is the output of the following code?

```python
my_list = [6, 2, 8, 2, 8]
new_list = []
for x in my_list:
    new_list = [x] + new_list
print(new_list)
```

(a) [8]  
(b) [6, 2, 8]  
(c) [6]  
(d) [6, 2, 8, 2, 8]  
(e) [6, 2, 8]

Question 18
[3.75 marks] What is the output of the following code?

```python
my_list = [6, 2, 8, 2, 8]
new_list = []
for x in my_list:
    new_list = [x] + new_list
print(new_list)
```

(a) 26  
(b) [8]  
(c) [8, 2, 8, 2, 6]  
(d) [26]  
(e) [6, 2, 8, 2, 8]
Question 21: Tracing Code

In the box below, perform a code trace (similar to what you have done in labs) on the following function to show how the value of each variable changes.

```python
def fun_with_variables():
    x = 3
    y = 4
    temp = x
    x = y
    y = temp
    a = 2
    b = 5
    a = b
    b = a
```

```
x = 3 4
y = 4 3
temp = 3
a = 2 5
b = 2 5
```

(9 marks)

Question 22: Write a Function

Complete the `convert_currency()` function below. This function accepts a list of values and an exchange rate, and creates a new list containing the original values converted into another currency. To convert the values in the list into the new currency, multiply each value by the exchange rate. The values in the new list should be rounded to 2 decimal places. Before returning the new list, your function should first print out the list of new values followed by the list of old values (as shown in the example in the doctest below).

```python
def convert_currency(values, exchange_rate):
    """
    Converts a list of values from one currency to another
    Arguments: List of values (float)
    Returns:   List of values in the new currency (float)
    Prints:    The new list and the old list
    >>> convert_currency([100, 65.75, 1045.0, 134], 1.5)
    New List: [150.0, 98.62, 1567.5, 201.0]
    Old List: [100, 65.75, 1045.0, 134]
    """
    new_list = []
    for value in values:
        new_list += [round(value*exchange_rate,2)]
    print ("New List!", new_list)
    print ("Old List!", values)
    return new_list

import doctest
doctest.testmod()
```

(10 marks)

Question 23: Understanding Python code

What is the output of the following Python program?

```python
def will_pay(my_list, my_limit):
    my_sum = 0
    for amount in my_list:
        my_sum += amount
    if my_sum <= my_limit:
        print("OK")
    else:
        print("No Way")

will_pay([2, 3, 4], 10)
will_pay([3, 3, 5], 10)
will_pay([2, 3, 5], 10)
```

```
OK
No Way
OK
```

(6 marks)
Rough Working – This page will not be marked