

May June 2017 (My suggested answers)

Question 2

2.1 What is the difference between literals and variables? Give an explanation and example of each item. (4)

Literals - are numbers or strings that appears directly in a program

i.e. 10.5, "Hello!"

Variables - are used for storing data in a program

i.e. 1 = 4, num = 10.5

2.2 Provide the output for the following program. (4)

```
#print.py
Print(1)
Print('Flight departure: \ Monday 1 January')
Print('Welcome aboard')
Print('Enjoy your flight!')
```

Output

```
1
Flight departure: Monday 1 January
Welcome aboard'
Enjoy your flight!
```

2.3 The following code displays the Lambda function. Rewrite the code to show a normal function definition. (4)

```
g = lambda x: x * 3
g(4)
```

Normal function

```
def g(x):
    return x * 3
print(g(4))
```

2.4 Write the code for a program that reads the content from the file information.txt. (4)

```
readfile.py

f = open('information.txt', 'r')
lines = f.readlines()
f.close()
```

2.5 Input widgets in PyQt programs are used for interacting with the user. Give two examples of input widgets and provide an explanation of each. (4)

- **Line Edit** – Displays a single-line text box for entering/editing plain text.
- **Text Edit** – Used to edit plain text.

Question 3

3.1 Recursion

a) Define recursion (2)

- It is when a function calls itself.

b) What condition must be included in the function and why? (2)

- A base case/exit condition needs to be included, to end the iteration.

c) Fill in the blank:

Recursion is implemented with the help of a structure known as Stack. (1)

d) Provide the code for a program that calculates and prints the sum of the first 20 natural numbers by using recursion. (5)

```
#sumrecursion.py
def sumN(n):
    if n == 1:
        return 1
    else:
        return n + sumN(n - 1)
print(sumN(20))
```

3.2 Inheritance

a) Define inheritance. (1)

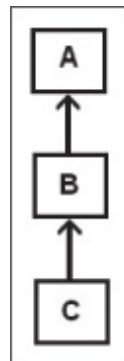
- Is the copying of data members and member functions of existing class into another class.

b) Discuss three types of inheritance by describing and drawing a visual representation of each type. (9)

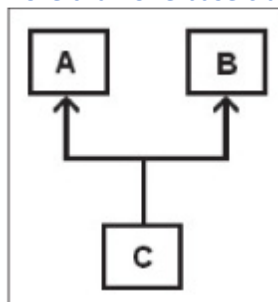
- **Single** – a class derived from another single class.



- **Multi-level** – a class is derived from a class that is derived from a base class.



- **Multiple** – a class derived from more than one base class.



3.3 Descriptors

- a) Define descriptors. (1)
- Classes that enable us to manage instance attributes efficiently.
- b) List the three methods used to manage instance attributes. (3)
- `__set__` method
 - `__get__` method
 - `__delete__` method
- c) Describe the two descriptor types and state what methods each type implements. (5)
- Non-data descriptor - `__get__` method
 - Data descriptor - `__get__`, `__set__`, and `__delete__` methods.