HARARE INSTITUTE OF TECHNOLOGY

SCHOOL OF INFORMATION SCIENCE AND TECHNOLOGY

B.TECH (HONS) DEGREE IN SOFTWARE ENGINEERING

PART 1 SEMESTER 2

ISE 121: OBJECT ORIENTED PROGRAMMING

TIME: 3 HOURS **DATE: MAY/JUNE 2018**

TOTAL MARKS: 100

INSTRUCTIONS TO CANDIDATES:

- This question paper contains a total of **FIVE** questions.
- Each question carries **25** marks
- Answer **any FOUR** questions
- Start a new question on a fresh page

Question 1

a. Write a program that shows passing an argument by value and reference in functions. [5]

b. Illustrate encapsulation using a class in python. [5]

c. Write a program that shows how to create instance objects and accessing attributes and methods in a class. [5]

d. Demonstrate the use of constructors and destructors by a python program of your own choice. [10]

Question 2

a. Design and implement a program which show inheritance in polygons e.g. in calculating the area and perimeter of various shapes. [10]

b. Outline the differences between method overriding and method overloading and then write a program which demonstrates these differences. [10]

c. Demonstrate operator overloading concept using a suitable program. [5]

Question 3

a. Write a program which uses read and write functions in files. [8]

b. Outline the differences between Object-Oriented, Object-Based and Procedural-Oriented Programming Languages with the aid of suitable examples. [5]

c. In Python tuples are said to be immutable while a list is not. Explain what this means using a Python script. [5]

d. Define the term "Dictionary" and using a Python program, illustrate how it can be used in an Information Management System e.g. Library Management System, Point of Sale System and Student Management System. [7]

Question 4

a. Explain the advantages and disadvantages of the Object-Oriented Methodology. [5]

b. Briefly describe the following terms using suitable code snippets:

i. Inline Function [3]

ii. Polymorphism [3]

iii. Abstract Class [3]

iv. "New-Style" Classes [3]

c. Write a program which demonstrates connecting to a SQLite database. [8]

Question 5

a. Demonstrate the concept of exception handling in files using a program which prompts an Accountant to create a CSV file and write information for a grocery shop like goods name, type, price, available stock, date purchased and person who sold. [10]

b. Deduce the output of the following snippet when the method main() is called. [8]

```
1.  list_names = []
2.  def my_fxn(name = "Chipo", *names):
3.      for i in range(3):
4.          list_names.append(name)
5.          if names == ():
6.              print(list_names)
7.              exit
8.          else:
9.              list_names.append(names)
10.         print(list_names)
11.
12. #main function
13. def main:
14.     my_fxn()
15.     my_fxn("Michael", 'HIT', 'UZ', "NUST")
```

c. Describe the four steps that happen when you call a constructor. [4]

d. Consider the function foo defined below.

```
def foo():
    return 5
```

What is the difference between the contents of the variables x and y after the assignment statements below?

```
x = foo()
y = foo
```

[3]

************THE END**************