(Knowledge for Development)

KIBABII UNIVERSITY

(KIBU)

UNIVERSITY EXAMINATIONS
2021/2022 ACADEMIC YEAR

END OF SEMESTER EXAMINATIONS
YEAR ONE SEMESTER ONE EXAMINATIONS

FOR THE DEGREE OF
MASTER OF SCIENCE
(DIGITAL FORENSICS)

COURSE CODE : MDF812

COURSE TITLE : PROGRAMMING FOR DIGITAL FORENSCIS

DATE: 30/09/2022 **TIME:** 2.00 – 5.00PM

INSTRUCTIONS TO CANDIDATES

ANSWER QUESTIONS ONE AND ANY OTHER TWO

QUESTION ONE [30 MARKS]

a) Outline three unique features of Python programming language that makes it a good fit for digital forensics projects. [6 marks]

b) A computer forensics investigation process involves three major phases, namely:

Phase 1: Acquisition or Imaging of Exhibits

Phase 2: Analysis

Phase 3: Presentation or Reporting

Briefly discuss each of the above phases. [8 marks]

c) One of the most common output formats of Forensic reports is a CSV spreadsheet report. Outline, using code snippets, how in Python you create a CSV output. [5 marks]

d) In Digital Forensics, we talk about embedded metadata. Using an example explain what embedded metadata means. [3 marks]

e) Internet Evidence Finder (IEF) is a digital forensic tool to find, analyze and present digital evidence found on different digital media like computer, smartphones, tablets etc. Explain four uses of the IEF. [4 marks]

f) IEF stores data in a SQLite database, outline the steps followed in order to dump reports from IEF to CSV using Python. [4 marks]

QUESTION TWO [20 MARKS]

a) Look at the following statement:

```
mystring = 'cookies>milk>fudge>cake>ice cream'
```

Write a statement that splits this string, creating the following list:

```
['cookies', 'milk', 'fudge', 'cake', 'ice cream']
```

[4 marks]

b) Assume the variable `dct` references a dictionary. Write an `if` statement that determines whether the key 'James' exists in the dictionary. If so, display the value that is associated with that key. If the key is not in the dictionary, display a message indicating so. [4 marks]

c) Write a program that reads the contents of a text file. The program should create a dictionary in which the keys are the individual words found in the file and the values are the number of times each word appears. For example, if the word "the" appears 128 times, the dictionary would contain an element with 'the' as the key and 128 as the value. The program should either display the frequency of each word or create a second file containing a list of each word and its frequency. [7 marks]

d) Write a while loop that asks the user to enter two numbers. The numbers should be added and the sum displayed. The loop should ask the user if he or she wishes to perform the operation again. If so, the loop should repeat, otherwise it should terminate. [5 marks]

QUESTION THREE [20 MARKS]

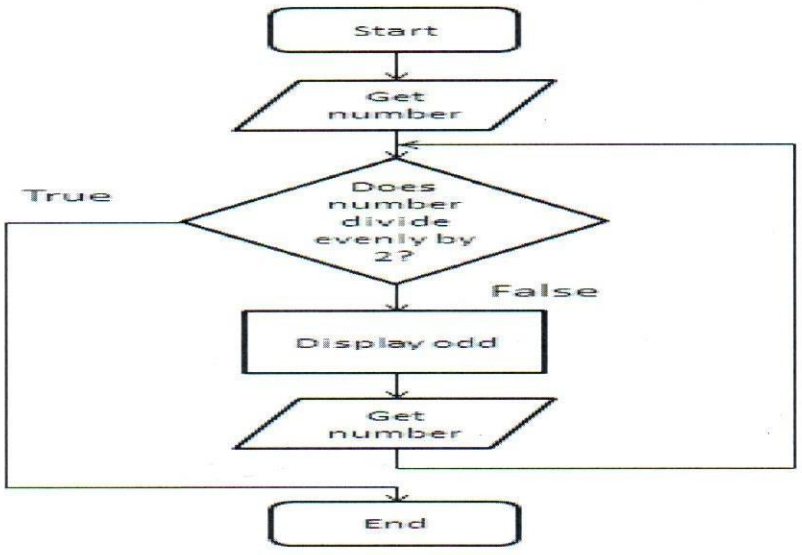
a) Implement a function that satisfies the specification: [6 marks]

```
def findAnEven(L):
    """Assumes L is a list of integers
    Returns the first even number in L
    Raises ValueError if L does not contain an even
number"""
```

b) Write a program that prompts for three numbers. Divide the first number by the second number and add that result to the third number. Using exceptions check for the following errors: `ValueError`, and `ZeroDivisionError`. [8 marks]

c) What are blocks in finally clauses used for? [1 mark]

d) Write code for the following flowchart. [5 marks]



QUESTION FOUR [20 MARKS]

a) Consider the following lines from the text **Romeo and Juliet** with punctuations removed. Assume the lines are stored in a text file named `Juliet.txt`

```
But soft what light through yonder window breaks
It is the east and Juliet is the sun
Arise fair sun and kill the envious moon
Who is already sick and pale with grief
```

i. Write Python code to prompt for the file name and open it for reading. Account for the case where the file does not exist. [4 marks]

ii. Write a program to count how many times each word appears in the file. Present your results as a dictionary object where the word is the key and the number of times it appears is the value. [110 marks]

iii. Write a program to write to a file all characters which occur more than 5 times in the text file above [6 marks]

QUESTION FIVE [20 MARKS]

a) Define a function that examines three variables- `x, y,` and `z`- and prints the largest odd number among them. If none of them are odd, it should print a message to that effect. [8 marks]

b) Write a function named `times_ten`. The function should accept an argument and display the product of its argument multiplied times 10 [7 marks]

c) What will the following program display? [5 marks]

```
def main():
    x = 1
    y = 3.4
```

```
    print(x, y)
    change_us(x, y)
    print(x, y)

def change_us(a, b):
    a = 0
    b = 0
    print(a, b)

main()
```