# UNIVERSITY OF KELANIYA – SRI LANKA
# FACULTY OF COMPUTING AND TECHNOLOGY

**Bachelor of Information and Communication Technology Honours**
**Degree Examination - January 2022**
**Academic Year 2019/2020 – Semester I**
**Computer Technology**
**CTEC 31042 / (R) – Python Programming**

No. of Questions : **Four (04)** No. of pages: **Three (03)** Time: **Two (02) hrs.**

Answer **all four** questions

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**1.**

a. In your own words, explain the concept of a "weakly typed" language and a "strongly typed" language. To which category does Python fall under? Describe with an example.

b. Explain the output of the following code snippet. Your explanation should include a short description on each line of the code snippet.

```
itemlist = (1,2,3,4,5)
itemlist[2] = 1
print(itemlist[2])
```

c. Explain the following python keywords with respect to python functions.

i. return
ii. pass
iii. docstring
iv. default argument

d.

i. In your own words, describe the difference between a "condition-controlled loop" and a "counter-controlled loop". Explain when you should use one as opposed to the other.

ii. Write Python code examples to demonstrate how you can use "condition-controlled" and "counter-controlled" loops to print the numbers from 1 to 5.

(20 marks)

2.

a. What is Duck-Typing? Explain it with a Python code snippet or pseudocode.
b. What is the difference between overriding and overloading? Support your answer with an example in pseudocode.
c. Explain the __enter__() and __exit__() methods in context managers.
d. Give three common types of inbuilt errors or exceptions in Python and explain the instances where they can occur.
e. How to raise an exception in Python? Support your answer with a Python code snippet.
f. Create a custom exception with a suitable error message, to check if a given string value contains any numbers in it. Note that the given value can contain only letters and symbols. (30 marks)

3. A Python program is supposed to load data from mydictionary.txt and parse the information to each word (name, type and definition). word is a new instance of a Word class. My dictionary is created with multiple word instances. MyDictionary maintains an appropriate container (data structure) to hold Word objects. The structure of the mydictionary.txt file looks like below.

```
noun
abdicator
One who abdicates.
**
adjective
abditive
Having the quality of hiding.
**
noun
abditory
A place for hiding or preserving articles of value.
**
```

a. Write a Python code snippet to define the Word class and MyDictionary class.
b. What is the Python container type that you would use to hold Word instances? Justify.
c. Write the 3 different modes a text file can be opened in Python. Describe the differences of each type.
d. Write a code snippet or pseudocode to load the mydictionary.txt file into its container of Word objects using a loadDictionary() method.

e. A Python program is required to prompt the user to enter a word. If that exact word is in the dictionary, print the word's name, followed directly on the same line by the word type and definition. If the word is not in the dictionary print 'word not found.' Write the corresponding code snippet.

(30 marks)

4.

a. Describe the two main methods of translating the high-level source code of a program into machine code so that it can be executed. Briefly explain the translation mechanism that is used in Python.

b. This program contains two errors that will result in exceptions occurring:

```
1  import datetime
2  current_year = datetime.datetime.now().year
3
4  birth_year = input('What is your year of birth?  ')
5  bday = input('Have you had your birthday this year (y/n)?  ')
6
7  age = current_year - birth_year
8
9  if bday.lower() == 'n':
10     age = Age - 1
11
12 print('You are', age, 'years old.')
```

Note: The first two lines of the program are correct, and will result in the "current_year" variable containing the current year as an integer.

For each of the errors identified in the above question:

i. Explain the purpose of using docstring in Python and show how to use it.

ii. Name the exception that will occur when this line of code is reached.

iii. Write a new version of the line of code that fixes the error.

c. How do dictionaries differ from lists in Python? State at least two differences.

i. Write Python code to create a list, and then print the value of an item in the list.

ii. Write Python code to create a dictionary and then print the value of an item in the dictionary.

d. In your own words, outline the concept of event-driven programming (used in programs with a graphical user interface), and define the terms "main loop" and "event"

(20 Marks)