



65

(Knowledge for Development)

KIBABII UNIVERSITY

**UNIVERSITY EXAMINATIONS
2020/2021 ACADEMIC YEAR**

**END OF SEMESTER EXAMINATIONS
YEAR ONE SEMESTER ONE EXAMINATIONS**

**FOR THE DEGREE OF
BACHELOR OF SCIENCE COMPUTER SCIENCE**

**COURSE CODE : CSC361E
COURSE TITLE : GENERIC
PROGRAMMING WITH PYTHON**

DATE: 14/07/2021 TIME: 9.00 A.M – 11.00 A.M

INSTRUCTIONS TO CANDIDATES

ANSWER QUESTION ONE AND ANY OTHER TWO QUESTIONS

QUESTION ONE [COMPULSORY] [30 MARKS]

- a) Write a line of Python code to randomly select 4 items from the list *menuitems* and assign it to the list *orders*. [2 marks]

- a) Suppose that **statement2** causes an exception in the following **try-except** block:

```
try:
    statement1
    statement3
except Exception1:
    # Handle exception 1
except Exception2:
    # Handle exception 2
statement4
```

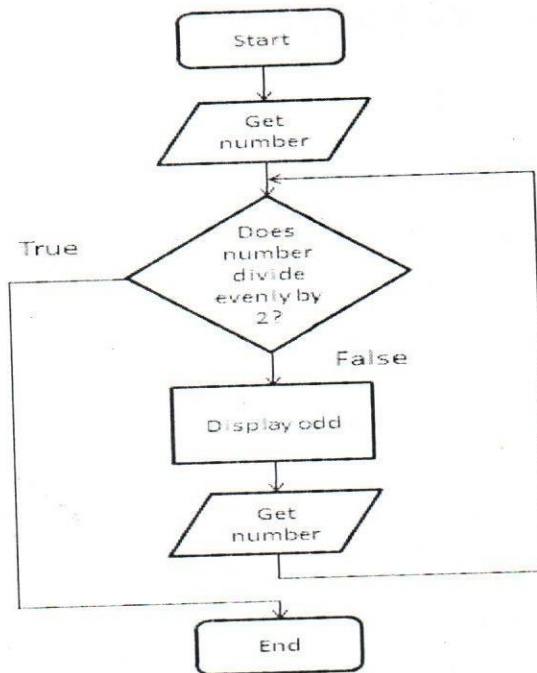
Answer the following questions:

[3 marks]

- Will **statement3** be executed?
 - If the exception is not caught, will **statement4** be executed?
 - If the exception is caught in the **except** block, will **statement4** be executed?
- b) What is the difference between a list and a tuple? Show how you create a list from a tuple and how you create a tuple from a list. [3 marks]
- c) Write a function that computes the sum of the digits in an integer. Use the following function header:
def sumDigits(n): For example, **sumDigits(234)** returns 9 (2+3+4) [4 marks]
- d) Which of the following dictionaries are created correctly? [3 marks]

```
d = {1:[1, 2], 3:[3, 4]}
d = {[1, 2]:1, [3, 4]:3}
d = {(1, 2):1, (3, 4):3}
d = {1:"john", 3:"peter"}
```

- e) Write a Python statement to open a file called *names* for writing and assign it to a variable called *outfile*. [2 marks]
- f) The class *RobotCar* is a subclass of the class *Robot*. Show how in Python you create the stated relationship. [2 marks]
- g) If the *Robot* class in f) above has one attribute **type** that stores a string specifying the type of robot and the *RobotCar* class has attribute **numberOfWheels**, show how you initialize this two attributes in the subclass. [3 marks]
- h) Given a list saved in a variable: *a* = [1, 4, 9, 16, 25, 36, 49, 64, 81, 100]. Using list comprehension, write one line of Python that takes this list *a* and makes a new list that has only the even elements of this list in it. [3 marks]
- i) Write code for the following flowchart. [5 marks]



QUESTIONS TWO [20 MARKS]

BankAccount

- balance : double
- interestRate : double

- + deposit(amount : double) : void
- + withdrawl(amount : double: void
- + addInterest() : void

- a) Explain the purpose of the *self* parameter in a method that is defined in a class. [1 mark]
- b) Give two reasons why instance variables should only be accessed from outside of a class definition via class methods? [2 marks]
- c) Write a bank account class in Python for the UML diagram shown above. [17 marks]

QUESTION THREE [20 MARKS]

- a) When the `__init__` method executes, what does the `self` parameter reference? **[1 mark]**
- b) Write a class definition named `Book`. The `Book` class should have data attributes for a book's title, the author's name, and the publisher's name. The class should also have the following:
- An `__init__` method for the class. The method should accept an argument for each of the data attributes. **[3 marks]**
 - Accessor and mutator methods for each data attribute. **[3 marks]**
 - An `__str__` method that returns a string indicating the state of the object. **[3 marks]**
- c)
- Write a class named `RetailItem` that holds data about an item in a retail store. The class should store the following data in attributes: item description, units in inventory, and price. **[7 marks]**
 - Once you have written the class, write a program that creates three `RetailItem` objects and stores the following data in them: **[3 marks]**

	Description	Units in Inventory	Price
Item #1	Jacket	12	59.95
Item #2	Designer Jeans	40	34.95
Item #3	Shirt	20	24.95

QUESTION FOUR [20 MARKS]

- a) Write a program that removes all the occurrences of a specified string from a text file and outputs the new file on the screen. Your program should prompt the user to enter a filename and a string to be removed. Here is a sample run: **[10 marks]**
- ```
Enter a filename: test.txt
Enter the string to be removed: morning
```
- b) Design a class called `Sentence` that has a constructor that takes a string representing the sentence as input. The class should have the following methods:
- `_get first word`
  - `_get all words`
  - `_replace(index, new word)`—Change a word at a particular index to “new word.” E.g. If the sentence is “I’m going back.” and set word at index (2, “home”), then the sentence becomes “I’m going home.” **[10 marks]**

### QUESTION FIVE [20 MARKS]

- a) Develop a program to help a class one pupil practice addition. The program randomly generates two single-digit integers, **number1** and **number2**, and displays to the student a question such as **What is 1 + 7**. The program evaluates the response and gives the feedback in the format. "Great! You got it right! Try the next question." or "That is incorrect, try the next question". After five questions print the overall result as "You scored 4/5".  
**[10 marks]**
- b) Write a program that reads an unspecified number of integers, determines how many positive and negative values have been read, and computes the total and average of the input values (not counting zeros). Your program ends with the input **0**. Display the average as a floating-point number.  
**[10 marks]**

**Sample output:**

```
Enter an integer, the input ends if it is 0: 3
Enter an integer, the input ends if it is 0: -1
Enter an integer, the input ends if it is 0: 2
Enter an integer, the input ends if it is 0: 1
Enter an integer, the input ends if it is 0: 0
```

```
The number of positives is 3
The number of negatives is 1
The total is 5
The average is 1.25
```