(*Knowledge for Development*)

KIBABII UNIVERSITY

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UNIVERSITY EXAMINATIONS
2021/2022 ACADEMIC YEAR

SPECIAL/SUPPLEMENTARY EXAMINATIONS
YEAR ONE SEMESTER ONE EXAMINATIONS

FOR THE DEGREE OF
(COMPUTER SCIENCE)

COURSE CODE : CSC 361E

COURSE TITLE : GENERIC PROGRAMMING USING PYTHON

DATE: 15/11/22 TIME: 02.00 P.M – 04.00 P.M

INSTRUCTIONS TO CANDIDATES

ANSWER QUESTIONS ONE AND ANY OTHER TWO QUESTIONS

QUESTION ONE [30 MARKS]

a) What will display after the following code is executed? [2 marks]

```
def main():
    print("The answer is", magic(5))

def magic(num):
    answer = num + 2 * 10
    return answer

main()
```

b) Write an `if-else` statement that assigns `0` to the variable `b` if the variable `a` is less than `10`. Otherwise, it should assign `99` to the variable `b`. [3 marks]

c) Write code that prompts the user to enter a positive nonzero number and validates the input. [3 marks]

d) If a file does not exist and a program attempts to open it in append mode, what happens? [1 mark]

e) What is the primary difference between a `list` and a `tuple`? [2 marks]

f) Assume that `my_list` references a `list`. Write a statement that converts it to a `tuple`. [1 mark]

g) What will the following code display? [2 marks]

```
values = [2, 4, 6, 8, 10]
print(values[1:3])
```

h) Write a statement that creates a list with the following strings: `'Einstein'`, `'Newton'`, `'Copernicus'`, and `'Kepler'`. [1 mark]

a) Assume `names` references a list. Write a for loop that displays each element of the list.

i) Assume the `names` variable references a list of strings. Write code that determines whether `'Ruby'` is in the names list. If it is, display the message 'Hello `Ruby`'. Otherwise, display the message `'No Ruby'`. [3 mark]

j) Write code using the `in` operator that determines whether 'd' is in `mystring`. [2 mark]

k) Assume the variable `big` references a string. Write a statement that converts the string it references to lowercase, and assigns the converted string to the variable `little`. [1 mark]

b) What will the following code display?

```
mystring = 'abcdefg'
print(mystring[2:5])
```

l) Write a loop that counts the number of space characters that appear in the string referenced by `mystring`. [3 mark]

m) Write a function that accepts a string as an argument and returns true if the argument ends with the substring `'.com'`. Otherwise, the function should return false. [3 mark]

c) Write a function that accepts a string as an argument and displays the string backwards

n) Assume `mystring` references a string. Write a statement that uses a slicing expression and displays the first 3 characters in the string. [2 mar]

d) Assume `mystring` references a string. Write a statement that uses a slicing expression and displays the last 3 characters in the string. [1 mark]

QUESTION TWO [20 MARKS]

a) A county collects property taxes on the assessment value of property, which is 60 percent of the property's actual value. For example, if an acre of land is valued at Ksh.1,000,000, its assessment value is Ksh.600,000. The property tax is then Ksh.640 for each Ksh.10,000 of the assessment value. The tax for the acre assessed at Ksh.600,000 will be Ksh.3840. Write a program that asks for the actual value of a piece of property and displays the assessment value and property tax. [9 marks]

b) Write an `if-else` statement that determines whether the `points` variable is outside the range of `9 to 51`. If the variable's value is outside this range it should display "`Invalid points.`" Otherwise, it should display "`Valid points.`" [3 marks]

c) A software company sells a package that retails for $99. Quantity discounts are given according to the following table:

Quantity	Discount
10–19	20%
20–49	30%
50–99	40%
100 or more	50%

Write a program that asks the user to enter the number of packages purchased. The program should then display the amount of the discount (if any) and the total amount of the purchase after the discount. [8 marks]

QUESTION THREE [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()
```

QUESTION FOUR [20 MARKS]

a) Write a Python program to open the file `romeo.txt` and read it line by line. For each line, split the line into a list of words using the `split` function. [8 marks]

b) For each word in question (a) above, check to see if the word is already in a list. If the word is not in the list, add it to the list. [6 marks]

c) When the program completes, sort and print the resulting words in alphabetical order. [6 marks]

QUESTION FIVE [30 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]

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