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PES University, Bangalore

(Established under Karnataka Act No. 16 of 2013)

UE16CS101

DECEMBER 2016: END SEMESTER ASSESSMENT (ESA) B.TECH. I SEMESTER

UE16CS101- Introduction to Computing using Python

Time: 3 Hrs | Answer All Questions | Max Marks: 100

1.	a)	Define the following i)Algorithm ii)Operating System iii)Moore's law iv)Limits of Computational problem solving	08
	b)	Describe the steps involved for a program execution by using i)Compiler ii)Interpreter	04
	c)	List two functions from each of the math and random libraries with an example to demonstrate the functions(total 4 functions)	04
	d)	i) Give the sequence of python steps required to produce today's date ii) Why is the id of two variables would be same for the values in the range -5 to 256 in the interactive mode.	04
2.	a)	Write a python script to find the mode for a set of n numbers read in an interactive manner.(Note:mode is the number that occurs with the highest frequency)	06
	b)	What is the output of the following expressions a)print("check:{a:10d}{b:10.2f}".format(b=456.678,a=235)) b)print("%10x"%10) c)for i in reversed(xrange(1,10,2)): print i d)for i, v in enumerate(['tic', 'tac', 'toe']): print i, v	04
	c)	a=16;b=12 what is the result executing the following expressions(Assume 16 bit representation for the numbers) i)a<<3 ii)a|b iii)~b iv)a^b	04
	d)	l1=[10,20,30,[60,70]] l2=20;l3=l1;l4=l1.copy import copy l5=copy.deepcopy(l1) In all of the above expressions,comment on the ids referred by different variables with the help of a diagram.	06
3.	a)	List the characteristics of list and dictionary data structures	06
	b)	I) With a given list [12,24,35,24,88,120,155,88,120,155], write a program to print this list after removing all duplicate values. ii) Given a string create a list of ordinal values from it. Iii) Write a program to concatenate three dictionaries to create a new one	08

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		iv) Write a program to convert a tuple of any type of data in it into a string	
	c)	From a given sentence ,extract each word and find if the word is in the pre-created dictionary as a key. If in case the word is present, print its two synonyms which are present as dictionary values. If the word is not present, interactively find out if the word has to be added. If yes, read two synonyms and add them to the dictionary or else give a suitable message.	06
4.	a)	Describe the default and keyword argument parameter passing mechanisms available in python for functions with examples	04
	b)	i)Using list comprehension, create a list of strings from the given list of strings such that the new list contains only the strings which do not have punctuation marks in it. ii)Write a recursive function that determines if a given number is divisible by seven or not.	04
	c)	i)S = {x^2 : x in {0 ... 9}} and M = {x | x in S and x even}. Use functional programming to do the above mathematical expression ii)Describe with an example ways of importing files residing in same and different directories.	04

	d)	i)Write a function implementing callback to check if the product of two consecutive Fibonacci sequence numbers is equal to the given number. Write a piece of code to test the functions
		ii)What is the output of the following piece of code
		`def f1(x):`
		`  def f(a):`
		`  nonlocal x`
		`  x=x+4`
		`  print(a,x)`
		`  x+=9`
		`  print(x)`
		`  return f`
		`print(f1(8)(3))`
		
		iii)`def f(a,b,c):`
		`  print(type(a),b,sum(c))`
		`l1=[3,4,5]`
		`l2=[5,6,7]`
		`l3=zip(l1,l2)`
		`f(*(tuple(l3)))`
			08

5.	a)	Design a class for representing bank account holder entity. Include suitable attributes (instance and class variable)and methods to complete the class design. Write test script to test the class with its instances.	06
	b)	What are built-in exceptions. Write a script to read a list of numbers and produce an output list that consists of dividing each number in the list by a factor n read from the user. If the value of n read is negative raise a generic exception. In addition, the script must catch at least two types of specific exceptions which relevant in this context. In case of no exceptions, the output list must be displayed.	06
	c)	Write a program to read a file passed from the command line. The file contains both digits and alphabets. Write them separately to two different files. Subsequently modify the file containing digits as follows. Every 3rd digit must be added by a factor 2 and rewritten to the same place(assume all operations result in single digits). At the end, display the contents of both the files	08