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PES UNIVERSITY

UE18CS101

End Semester Assessment (ESA) B. Tech. 1st SEMESTER – Aug - Dec-2018
UE18CS101 - Introduction to Computing Using Python

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

1	a)	Say True or False for the following. i) An operating system is the part of the hardware that controls all other hardware components of a computer system. ii) Most programs are written in machine code because this is the only thing the CPU can process. iii) Any algorithm that correctly solves a given problem must solve the problem in a reasonable amount of time; otherwise it is of limited practical use. iv) An identifier in Python is a sequence of one or more characters that must begin with a letter or a digit. v) Unary operators are applied to a single operand.	5
	b)	Evaluate the following expressions: I) a = 12; b = 5; print(a | b) ii) x = 5 ; print(x << 2, x >> 2) iii) print(3 ^ 3 ^ 3) iv) x= 0; y= 10 i) print(x == 0 and y// x > 5) ii) print(x == 0 or y// x> 5)	5

	c)	What gets printed?
		i)
		`n = 4`
		`while ++n:`
		`  print(n)`
		`  n=n+1`
		ii) `x = "abcdef"`
		`i = "a"`
		`while i in x:`
		`  print('i', end = " ")`
		iii) `for i in [1, 2, 3, 4][::-1]:`
		`  print (i,end=' , ' )`
		iv) `for i in range(1, 5, -1) :`
		`  print(i + 1, end = " ")`
		`  i=i+1`
			4

	d)	A website requires the user to input username and password to register. Write a python program to check the validity of password input by the user. Following are the criteria for checking the validity of the password:- i. At least 1 letter between 'a-z' ii. At least 1 number between '0-9' iii. At least 1 letter between 'A-Z' iv. At least 1 character from '$#@' v. Minimum length of transaction password: 6 vi. Maximum length of transaction password: 12 case 1: input: ABd1234@1 output: valid case 2: input: ABCDqwer output: invalid	6

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2	a)	Write a python program to print the following pattern. abcd bcd cd d	5
	b)	What is the output? i) list1 = [10,20,30,40] list2 = [10,20,30,40] list1[0] = 100 print(list2) ii) s = "PESU" s = (s + s).replace(s, ' ') print(s) iii) t = ([11, 22], [33, 44]) t[0] += [55, 66] print(t) iv)Output not in particular order d = dict() for i in range(1, 4): d['a' + str(i)] = 'a' * i print(d)	6 (1+1+ 1+3)
	c)	Write the output(not in particular order.) s1 = set(range(5)) s2 = set(range(0, 10, 2)) s3 = s1 – s2; print(s3) s4 = s2 – s1; print(s4) s5 = s3 & s4; print(s5) s6 = s3 | s4; print(s6)	4
	d)	With a given integral number n, write a program to generate a dictionary that contains i:i*i such that is an integral number between 1 and n (both inclusive). and then the program should print the dictionary. If n=6 ,then the output sould be {1: 1, 2: 4, 3: 9, 4: 16, 5: 25, 6: 36}	5

3	a)	Write the output for the following:-
		i)
		def list1(val, list=[]):
		list.append(val)
		return list
		
		lst1 = list1(10)
		lst2 = list1(123,[])
		print(lst1)
		print(lst2)
		
		ii)
		def f1(x):
		for k in range(0, len(x)):
		if x[k] < 0:
		x[k] = 0
		return sum(x)
		y = [15, -7, 5, 2, -6, -1]
		total = f1(y)
		print('total = ', total)
		print(y)
			5
			(2+3)

	b)	Write a Python program to calculate the value of a to the power b using recursion.	5
	c)	Define a function that can accept two strings as input and print the string with maximum length on to the console. If two strings have the same length, then the function should print both the strings.	5

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	d)	Complete the # todo part of the function definition to get the desired output. Input: num_dict={1:[100,1,1003],3:[300,3,1002],2:[200,2,1001]} Expected output: {2:[200,2,1001],3:[300,3,1002],1:[100,1,1003]} def sort_dict(d): # todo function definition to return a sorted dictionary based on the last element of the list which is used as the value for the given key . num_dict={1:[100,1,1003],3:[300,3,1002],2:[200,2,1001]} print(sort_dict(num_dict))	5

4	a)	What is the output ?
		i)
		a = [1,2,4,1,2,3]
		s =set(a)
		def check(n):
		if n in s:
		return True
		else:
		return False
		print (filter(check, a))
		
		ii)
		x = 'abcd'
		print(list(map(list, x)))
		
		iii) Write a code to determine the maximum element in a given list containing values using reduce.
			6
			(2+2+2)

	b)	Write a python code for the following using list comprehension. i) Find all numbers which are odd and which are palindromes between a pair of numbers between 20 and 100 (both inclusive). ii)Create a list of numbers and a list of strings. Both the lists are of same size. Combine two lists to make a list of tuples.	6 (3+3)

	c)	Write the output for the following.
		def G_fun(n):
		i=0
		while i<=n:
		if i%2==0:
		yield i
		i+=1
		n=10
		values = []
		for i in G_fun(n):
		values.append(str(i))
		print (",".join(values))
			3

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	d)	i) Explain 4 ways of importing a file. ii)Find the output when a.py is executed as python a.py. File: abc.py print("this is with in abc.py") print('abc', __name__) File: a.py print("this is with in a.py") a=10 def f1(): print("this is function f1") import abc print('a',__name__)	5 (2+3)
5	a)	Define a user defined type named Shape. Derive a type Square from Shape. The Square takes length as an argument. Add a function area() in both the types. Shape's area is 0 by default.Write the implementation for the following interface. aSquare= Square(3) print (aSquare.area()) aShape=Shape() print(aShape.area())	8

	b)	I)Explain the following.
		i) try: ii) except iii) finally
		II) What is the output for the following code?
		i) def f():
		  try:
		  return 1
		  finally:
		  return 2
		k = f()
		print(k)
		ii. try:
		  if '1' != 1:
		  raise "someError"
		  else:
		  print("someError has not occured")
		except "someError":
		  print ("someError has occurred")
			6
			(3+1+2)

	c)	Write a program to count the number of capital letters and small letters in a file. Write the output to a separate file.	6

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UE17CS101

End Semester Assessment (ESA) B. Tech. 1st SEMESTER – Aug - Dec-2017

UE17CS101 - Introduction to Computing Using Python

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

1	a	Indicate the output or reason for error if any. print("text) print("25" / "5") a = 10; b = 0; print(str(a) * b) a = 10; b = 10; print(a === b) a = 10; print(++a)	5
	b	Find the output in each case. x = 100; y = x; y = 200; print(x) x = [100, 200]; y = x; y = [300, 400]; print(x) x = [100, 200]; y = x; y.extend([300, 400]); print(x) x = [100, [200]]; y = x; y[0] = [300, 400]; print(x) x = [100, 200]; y = x; y += [300, 400]; print(x)	5
	c	Evaluate these expressions. 5 == 5 == 5 (2 + 3, 3 + 2) * 2 2 * "25" True and True or not True 5 in range(5)	5
	d	Find the type of the following expressions if the expression is valid. Otherwise indicate the error. (-25) ** 0.5 "pes"[1] {"x" : 25, 25 : "y"}[25] == 'x' {} set({})	5

2	a	n = int(input("enter a number:"))
		s = 0
		while n :
		  if n % 2 :
		  s += 1
		  n >>= 1
		print(s)
		Find the output for the following inputs
		i) 25
		ii) 15
		What does the program do?
			5

	b	Write a program to find the biggest number in the geometric progression with start value a and common ratio r less than a given number n. Inputs are a, r and n. Hint: geometric progression has the terms a, ar, ar^2 ar^3 ..	5

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	c	n = int(input("enter a number:"))
		i = 2
		while n > 1 :
		  while n % i == 0 :
		  print(i, end = " ")
		  n //= i
		  i += 1
		print()
		
		Find the output for the following inputs.
		i) 54
		ii) 24
		What does the program do?
			5

	d	Write a program to generate the following pattern for a given value of n. If n = 4, then the expected output is: 4 4 4 4 4 3 3 3 4 3 2 2 4 3 2 1	5

3	a	Find the output.
		a = []
		for i in range(4):
		  a.append([])
		  for j in range(i + 1):
		  a[i].append(j * j)
		print(a)
			4

	b	Write a program segment to achieve the following.
		Create a dictionary of lists given two lists.
		Input:
		a = ['karnataka', 'tamilnad', 'karnataka', 'karnataka', 'tamilnad', 'kerala']
		b = ['mysore', 'chennai', 'hassan', 'shimoga', 'madurai', 'trivandrum']
		output:
		d = {
		  'karnataka' : ['mysore', 'hassan', 'shimoga'],
		  'tamilnad' : ['chennai', 'madurai'],
		  'kerala' : ['trivandrum']
		}
			5

	c	Find the resultant set. Display the elements. i) set("1234") ii) set(("1234")) iii) set(("12", "34")) iv) set(set("1234")) v) set("12" + "34")	5
	d	Write a program to decode ['m', 'i', 's', (2, 1), (1, 1), (2, 3), 'p', (8, 1), (1, 1)] as mississippi. If it is a character, that itself is the decoded form. If it is a tuple, in the decoded string so far, the first is the position and the second is the length of the string.	6

		ex: decoded string : empty m => m i => mi s => mis (2, 1) => miss # char in position 2 which is s repeated once (1, 1) => missi (2, 3) => mississi # string in position 2 of length 3 from the previous decoded string : ssi	
4	a	Write a function that accepts a comma separated sequence of words as argument and returns a string which contains the words in a comma-separated sequence after sorting the words alphabetically. def foo(s): pass # TODO For Ex: foo("hi,how,are,you?") should return "are,hi,how,you?"	4
	b	def foo(x, y) : z = 0 for i in x : for j in y : z += 1 return z What happens in the following calls? print(foo((1, 2, 3), (4, 5))) print(foo({ 10 : "ten", 20 : "twenty" }, { 30 : "thirty" }))	4
	c	Given two lists of integers a and b, write single liners to achieve the following. i) Check whether the sum of the elements of a is greater than the sum of the elements of b. Evaluate to True if this condition is True otherwise False. ii) Generate a list of integers complementing each element in the given list with respect to 100. if the element in a is 25, the corresponding element in the resultant list should be 75. iii) Generate the product of all elements of the list a	6

	d	Indicate no output or actual output for each of the statements following the class definition.
		class A:
		def __init__(self):
		print("ctor")
		def __del__(self):
		print("dtor")
		x = A()
		y = x
		z = A()
		del x
		y = 111
		x = 222
			6

5	a	i) Use list comprehension to walk through a list of points - each point expressed as a pair of co-ordinates and find all the points in the first quadrant excluding those on the axes. ii) Find the output when test.py is executed as python test.py. File: abc.py print('three : ', __name__)	3 3

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		File: test.py print('one') import abc print('two : ', __name__)	
	b	What is the output with and without the statements marked X? def foo() : try: print("ondu") print(gottilla) print("eradu") except NameError: #X print("mooru") #X except KeyError: print("nalku") print("idu") print("three") foo() print("aaru")	4
	c	If f1 and f2 are file objects opened for reading, what would the following expression give? set(f1) and set(f2)	3

	d	i) Find the output.
		class A:
		def __iter__(self):
		self.x = 0
		return self
		def __next__(self):
		self.x += 11
		return self.x
		a = A()
		x = iter(a)
		y = iter(a)
		print(next(x))
		print(next(y))
		print(next(x))
		
		ii) Find the output.
		def gen():
		while True:
		yield True
		yield False
		g = gen()
		for i in range(4):
		print(next(g))
			3 + 4

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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

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PES University, Bengaluru

(Established under Karnataka Act No. 16 of 2013)

UE15CS101

DECEMBER 2015: END SEMESTER ASSESSMENT B. TECH. I SEMESTER

UE15CS101 - Introduction to Computing using Python

Time: 180 Mins | Answer All Questions | Max Marks: 100

1	a	Convert the following to base 10. Show all the steps. i. $(AA)_{12}$ ii. $(HA)_{23}$	4
	b	What is in common within each of the following groups of binary numbers? i. values that end with a "0" digit (e.g., 1100). ii. values that end with a "1" digit (e.g., 1100). iii. values with a leftmost digit of "1," followed by all "0s" (e.g., 1000). iv. (d) values consisting only of all "1" digits (e.g., 1111).	4
	c	Write a Python program that allows the user to enter any integer base and integer exponent, and displays the value of the base raised to that exponent. Your program should function as shown below as an example. What base? 10 What power of 10? 4 10 to the power of 4 is 10000	4
	d	What is the difference between a compiler and interpreter? Is python program compiled or interpreted or both?	8
2	a	Write a python Program to interchange the values of variables of a & b without using the third variable. Your program should function as shown below as an example. a=50 b=500 Before Interchange a= 50 b= 500 After Interchange a= 500 b= 50	4
	b	Evaluate the following expressions in Python i. print("Hello")+"PES" ii. 10+20**2/(10**2)+12+3**3*10	4
	c	Give a logically equivalent expression for each of the following. i. num != 25 or num == 0 ii. 1 <= num and num <= 50 iii. not num > 100 and not num < 0 iv. (num < 0 or num > 100)	4

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	d	Give an appropriate if statement for each of the following. i. An if statement that displays 'PESU' if X is between 0 and 100, inclusive. ii. An if statement that displays 'ICUP' if X is between 0 and 100, inclusive, and displays '15CS101' otherwise. iii. An if statement that displays 'PESU' if X is between 100 and 1000 inclusive and x is an odd number. iv. An if statement that displays 'ICUP' if X is between 300 and 100 inclusive and x is an even number.	8
3	a)	For lst = [4, 2, 9, 1], what is the result of each of the following list operations? i. lst[1] ii. lst.insert(2, 3) iii. del lst[3] iv. lst.append(3)	4
	b)	Which of the following are valid operations on tuples (for tuples `t1` and `t2`)? Explain your options. i. len(t1) ii. t1 + t2 iii. t1.append(t2) iv. t1.insert(t2)	4
	c	For the following information of the type <username, password> <"PESU","t-12345">, <"B.Tech","t-100">, <"Icup","Subject">, <"Year","First"> Create a relevant dictionary named Password using the above given information. Write a relevant python segment of code accepting user name and password, check if the entered is relevant for the given existing username. Your program should function as shown below as an example. Sample Input - 1 User name = Icup password = N Password Incorrect Sample Input -2 User name = Icup password = Subject Password Correct	8
	d	With a typical example explain the following string applicable sequence operations in python. i. Slice ii. Membership	4