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B.TECH
(SEM III) THEORY EXAMINATION 2020-21
PYTHON PROGRAMMING

Time: 3 Hours

Total Marks: 100

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt all questions in brief.

Q no.	Question	Marks	CO
a.	What is the use of “raise” statement? Describe with an example.	2	5
b.	Write a recursive Python function “rprint” to print all elements in a list in reverse. rprint([]) prints nothing rprint([1,2,3]) prints 3 2 1	2	3
c.	Describe the behavior of “range (s, e)” in Python.	2	3
d.	Explain the use of “with” construct in Python with an example program.	2	5
e.	Which of the following statements produce an error in Python? x, y, z = 1,2,3 # s1 a, b = 4,5,6 # s2 u = 7,8,9 # s3 (List all the statements that have error.)	2	1
f.	Explain the role of precedence with an example.	2	1
g.	How do you read an input from a user in Python to be used as an integer in the rest of the program? Explain with an example.	2	5
h.	Consider the program: x = ['12', 'hello', 456] x[0] *= 3 x[1][1] = 'bye' Explain why this program generates an error.	2	1
i.	What is the output of the following program? (lambda x, y : y - 2*x) (1, 11)	2	5
j.	Explain the use of <code>__init__</code> function in a class Python?	2	5



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SECTION B

2. Attempt any *three* of the following:

Q no.	Question	Marks	CO
a.	Write a Python function <code>removekth(s, k)</code> that takes as input a string <code>s</code> and an integer <code>k >= 0</code> and removes the character at index <code>k</code> . If <code>k</code> is beyond the length of <code>s</code> , the whole of <code>s</code> is returned. For example, <code>removekth("PYTHON", 1)</code> returns <code>"PTHON"</code> <code>removekth("PYTHON", 3)</code> returns <code>"PYTON"</code> <code>removekth("PYTHON", 0)</code> returns <code>"YTHON"</code> <code>removekth("PYTHON", 20)</code> returns <code>"PYTHON"</code>	10	5
b.	Write a Python function <code>average</code> to compute the average of a list of numbers. The function must use <code>try-except</code> to handle the case where the input list is empty. Further, in that case the average for the empty list should be set to <code>0.0</code> using the <code>except</code> block.	10	3
c.	Describe the differences between a linear search and a binary search?	10	5
d.	Write a function <code>lessthan(lst, k)</code> to return list of numbers less than <code>k</code> from a list <code>lst</code> . The function must use list comprehension. Example: <code>lessthan([1, -2, 0, 5, -3], 0)</code> returns <code>[-2, -3]</code>	10	4
e.	Write a program <code>factors(N)</code> that returns a list of all positive divisors of <code>N</code> (<code>N >= 1</code>). For example: <code>factors(6)</code> returns <code>[1, 2, 3, 6]</code> <code>factors(1)</code> returns <code>[1]</code> <code>factors(13)</code> returns <code>[1, 13]</code>	10	2

SECTION C

3. Attempt any *one* part of the following:

Q no.	Question	Marks	CO
a.	How can you create Python file that can be imported as a library as well as run as a standalone script?	10	5
b.	Describe the difference between <code>import library</code> and <code>from library import *</code> when used in a python program. Here <code>library</code> is some python library.	10	5



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4. Attempt any *one* part of the following:

Q no.	Question	Marks	CO
a.	Write a function <code>makePairs</code> that takes as input two lists of equal length and returns a single list of same length where k-th element is the pair of k-th elements from the input lists. For example, <pre>makePairs([1,3,5,7],[2,4,6,8]) returns [(1,2),(3,4),(5,6),(7,8)] makePairs([],[]) returns []</pre>	10	2
b.	Show an example where both Keyword arguments and Default arguments are used for the same function in a call. Show both the definition of the function and its call.	10	4

5. Attempt any *one* part of the following:

Q no.	Question	Marks	CO
a.	Explain why Python is considered an interpreted language.	10	1
b.	What is short circuit evaluation? What is printed by the following Python program? <pre>a = 0 b = 2 c = 3 x = c or a print(x)</pre>	10	1



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6. Attempt any *one* part of the following:

Q no.	Question	Marks	CO
a.	<p>Write a Python program, <code>triangle(N)</code>, that prints a right triangle having base and height consisting of <code>N * *</code> symbols as shown in these examples:</p> <pre>triangle(3) prints: * ** *** triangle(5) prints: * ** *** **** *****</pre>	10	3
b.	<p>Write a Python program, <code>countSquares(N)</code>, that returns the count of perfect squares less than or equal to <code>N (N>1)</code>. For example:</p> <pre>countSquares(1) returns 1 # Only 1 is a perfect square <= 1 countSquares(5) returns 2 # 1, 4 are perfect squares <= 5 countSquares(55) returns 7 # 1, 4, 9, 16, 25, 36, 49 <= 55</pre>	10	4

7. Attempt any *one* part of the following:

Q no.	Question	Marks	CO
a.	<p>Write a Python function, <code>alternating(lst)</code>, that takes as argument a sequence <code>lst</code>. The function returns <code>True</code> if the elements in <code>lst</code> are alternately odd and even, starting with an even number. Otherwise it returns <code>False</code>. For example:</p> <pre>alternating([10, 9, 9, 6]) returns False alternating([10, 15, 8]) returns True alternating([10]) returns True alternating([]) returns True alternating([15, 10, 9]) returns False</pre>	10	4
b.	<p>Write a Python function, <code>searchMany(s, x, k)</code>, that takes as argument a sequence <code>s</code> and integers <code>x, k (k>0)</code>. The function returns <code>True</code> if there are <i>at most k occurrences of x in s</i>. Otherwise it returns <code>False</code>. For example:</p> <pre>searchMany([10, 17, 15, 12], 15, 1) returns True searchMany([10, 12, 12, 12], 12, 2) returns False searchMany([10, 12, 15, 11], 17, 18) returns True</pre>	10	3