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**NAME OF PROGRAM**
**(SEM ….) THEORY EXAMINATION 2019-20**
**SUBJECT NAME**

***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. 2 x 10 = 20**

| Q no. | Question | Marks | CO |
|---|---|---|---|
| a. | Explain two different usages of `def` in Python with examples. | 2 | 4 |
| b. | Write a recursive Python program to print numbers from `N` to `1` (`N >= 1`) in a single line, separated by space. | 2 | 5 |
| c. | Describe the behavior of "`while`" construct in Python with an Example. | 2 | 2 |
| d. | Explain the difference between "`break`" and "`continue`" constructs in Python. | 2 | 2 |
| e. | Write Python statement to create **tuple** containing a single element `1054`. | 2 | 1 |
| f. | When evaluating a complicated expression, what is the role of associativity? Why is it important? | 2 | 1 |
| g. | Describe the use of keyword argument in `print` with an example. | 2 | 1 |
| h. | What is an immutable data structure? Are dictionaries mutable or immutable? Explain with an example. | 2 | 3 |
| i. | Write a lambda function that takes one string argument `x` and returns a tuple `(x, lenx)`. Here `lenx` is the length of string `x`. | 2 | 3 |
| j. | What is a Generator function in Python? | 2 | 4 |

**SECTION B**

**2. Attempt any *three* of the following:**

| Q no. | Question | Marks | CO |
|---|---|---|---|
| a. | Write a Python function `shl(s, k)` that takes as input a string `s` and a positive integer `k` and shifts `s` left by `k` steps. The length of the returned string is kept same as `s` by padding with `%` symbol on the right. For example,<br>`shl("PYTHON", 1)` returns `"YTHON%"` | 10 | 3 |

| | | | |
|---|---|---|---|
| | `shl("PYTHON", 3)` returns `"HON%%%"`<br>`shl("PYTHON", 6)` returns `"%%%%%%"`<br>`shl("PYTHON", 20)` returns `"%%%%%%"` | | |
| b. | Explain the use of `try-except-else` with an example. | 10 | 4 |
| c. | Write a Python program, m`insearch(list)`, to do a linear search for the minimum value in the given `list`. | 10 | 5 |
| d. | Write a program `sqrAllPos(lst)` that squares all the **positive** numbers in the list `lst` using list comprehension. Example:<br>`sqrAll([1, -2, 0, 2, -3])` returns `[1, 0, 4]` | 10 | 3 |
| e. | Write a program `powXY(x,y)` that returns the largest power of `y` that is a factor of `N`. For example:<br>`powXY(6, 2)` returns `1` `// 2¹ divides 6`<br>`powXY(100, 5)` returns `2` `// 5² divides 100`<br>`powXY(27, 3)` returns `3` `// 3³ divides 24` | 10 | 2 |

## SECTION C

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

| Q no. | Question | Marks | CO |
|---|---|---|---|
| a. | What is a class in Python? What is the use of a class? | 10 | 4 |
| b. | What is an inheritance in Python? Why is it useful? | 10 | 4 |

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

| Q no. | Question | Marks | CO |
|---|---|---|---|
| a. | Write a function `addpair` that takes as input a list of pairs (2-tuples) and returns a list containing the sum of the element of the pairs. For example,<br>`addpair([(1,2),(3,4),(5,6),(7,8)])`<br>returns `([3,7,11,15])` | 10 | 3 |
| b. | What are **Default** arguments in Python? Why is the concept of default arguments useful? | 10 | 3 |

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

| Q no. | Question | Marks | CO |
|---|---|---|---|
| a. | Describe various stages in the Python programming cycle. | 10 | 1 |
| b. | Describe // operator in Python. How is it different from / operator? | 10 | 1 |

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

| Q no. | Question | Marks | CO |
|---|---|---|---|
| a. | Write a Python program, `pattern(N)`, that prints a parallelogram having `N *` symbols on each side, as shown in these examples:<br>`pattern(3)` prints:<br>`***`<br>` ***`<br>`  ***`<br>`pattern(5)` prints:<br>`*****`<br>` *****`<br>`  *****`<br>`   *****`<br>`    *****` | 10 | 2 |
| b. | A positive number $z$ can be called a **Fibonacci Number** if it occurs in the Fibonacci series $fib$, defined as:<br>$fib(0) = 1, \quad fib(1) = 1,$<br>$fib(n) = fib(n-1) + fib(n-2) \quad for\ n \geq 2$<br>For example, 1,1, 2, 3, 5, 8… etc. are Fibonacci numbers but 4, 6, 7, 9 are not.<br>Write a Python program, `isFib(N)`, that returns `True` if `N` is a Fibonacci number (`N>0`). | 10 | 2 |

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

| Q no. | Question | Marks | CO |
|---|---|---|---|
| a. | Write a Python function, `searchNbrs(s, k)`, that takes as argument a sequence `s` and an integer `k`. The function returns `True` if all of `k-1, k`, and `k+1` exist in `s` (anywhere, not necessarily in order or together), otherwise it returns `False`. Example:<br>`searchNbrs([10, 12, 15, 17, 16], 16)` returns `True`<br>`searchNbrs([10, 12, 15, 17, 16], 15)` returns `False` | 10 | 5 |
| b. | Write a Python function, `searchB(s1, s2, x)`, that takes as argument two sequences `s1 and s2`, and an integer `x`. The function returns `True` if `x` exists either in `s1` or in `s2` but not in both. Otherwise it returns `False`. Example:<br>`searchB([10, 15, 11], [17, 15], 15)` returns `False`<br>`searchB([10, 15, 15], [16, 11], 15)` returns `True` | 10 | 5 |