National University
of Computer & Emerging Sciences
Peshawar Campus

Name:	Nauman	**Roll No**:	—
Section:	E	**Examination**:	Sessional - II
Semester:	Fall 2017	**Total marks**: 20	**Weight**: 10
Time allowed:	60 mins	**Date**:	Oct, 2017
Course:	CS101 Intro. to Computing	**Instructor**:	Dr. Nauman

Q. No.:	1	2	3	4	5	6	7	8	9	10	11	12	13	Sum	Sign
Scored:															
Total:	1	1	2	3	1	3	1	2	1	2	2	1	1		

- Attempt all questions on the question sheet in the provided space. Text outside the given space (or on another page) will not be read.
- Answer the questions as concisely as possible. Please keep your text within the provided space.
- You may use the back of each page for rough work and brainstorming.
- Think about the question before answering. You have a lot of time to solve the paper but every question would require time to see what the examiner wants. Do not rush.
- In case of objective type questions, pick the most appropriate answer and put a *checkmark* in the box to its left.
- **For all questions which ask about output/result of code, assume you wrote just the code given in the question in a new notebook cell and no input was given to the interpreter before it.**
- Have fun and enjoy the paper!

---

1. If we run the following code in a python2 notebook, what will be the output:

```
type(1/2)
```

Score / 1

int

2. What is a *docstring* and why is it needed?

A docstring is a multiline string that describes the functionality of a function.

Score / 1

3. Take a look at the following two functions:

```
def a(n):
    n = n * n
    print n
```

```
def b(n):
    n = n * n
    return n
```

What will be the value of these two call expressions: `a(4)` and `b(4)`?

a(4) ⟶ None

b(4) ⟶ 16

Score / 2

4. Define a new function called f, that takes in one parameter – a real number x – and returns a value according to this formula:

$$f(x) = \sum_{i=1}^{30} \left[\left(\frac{2}{x^2} + \frac{3}{x^3} + \frac{4}{x^4} + \frac{5}{x^5} \right) \times i \right]$$

```
def f(x):
    v = 2/pow(x,2) + 3/pow(x,3) + 4/pow(x,4) + 5/pow(x,5)
    sum = 0
    for i in range(1, 31):
        sum += v * i

    return sum
```

Score / 3

5. If we run the following code in the notebook, what will be the output:

```
a = [(4, 'a'), (3, 'b', 5), ('c', 5, 7)]
type(a[2][0])
```

str

Score / 1

6. Write a *3-line piece of code* that uses loop(s) to produce the following four lines of output.

```
*
**
***
---
```

```
for i in range(1, 4):
    print '*' * i
print '-' * 3
```

Score / 3

7. What will be the output of the following code:

```
def f(x=1.0):
    x = x + y
    y = 1
    print x
f(4)
```

UnboundLocalError

Score / 1

8. Write a function that takes in a number and a list as input. It should decide if the number is present in the list and also if the number is a multiple of 5. The function should return True if both conditions are met and False otherwise.

```
def f(n, l):
    return (n in l) and (n%5 ==0)
```

Score / 2

9. Take a look at this list: `digits = [ 1, 5, 4, 6, 7, 9 ]`
Write a snippet of code that retrieves the elements valued 5 to 7 (both inclusive).

```
digits[1:5]   /or/   digits[1:-1]
```

Score / 1

10. Given a list (called `nums`) of 10 elements, write a two-line snippet of code that retrieves the *three highest values* from this list.

```
nums.sort(reverse=True)
nums[:3]
```

Score / 2

11. Given a dictionary (named `conf`) with no elements, write code to insert the following key, value pairs in the dictionary:

Key	Value
'host'	'autograder.pwr.nu.edu.pk'
'protocol'	'tls'

```
conf['host'] = 'autograder.pwr.nu.edu.pk'
conf['protocol'] = 'tls'
```

Score / 2

12. For the above dictionary, after executing your code, what will be the result of the following: `len(conf)`

2

Score / 1

13. Bonus question: In *PEP 8 – Style Guide for Python Code*, the authors talk about several stylistics factors of python code such as indentation. Name two more factors. (Just the names, no details.)

(Read the PEP!)

Score

/ 1

— end of exam —

```
# For those without a sense of humor: The following is NOT a part of the exam. Ignore it.

a = ['S', ' ', 'w', 'a', 's', 'i', 'n', 'g', 'm',
     'e', 'd', 'b', 'c', 'k', 'r', '!', 't', 'o', 'p',]

l = [0, 16, 17, 18, 1, 2, 3, 4, 16, 5, 6, 7, 1, 16,
      5, 8, 9, 1, 3, 6, 10, 1, 7, 9, 16, 1, 11, 3,
      12, 13, 1, 16, 17, 1, 2, 17, 14, 13, 15]

for i in l:
   print a[i],
```