National University of Computer and Emerging Sciences

School of Computing **Fall 2014** **Islamabad Campus**

CS101
Introduction to Computing

Monday, September 29, 2014

Course Instructor

Dr. Sibt ul Hussain, Dr. Hassan Mujtaba, Miss Uzma Marooof

Serial No:

Mid I

Total Time: 1 Hour

Total Marks: 100

_____
Signature of Invigilator

_____ _____ _____ _____

Student Name Roll No Section Signature

DO NOT OPEN THE QUESTION BOOK OR START UNTIL INSTRUCTED.

Instructions:

1. Attempt on question paper. Attempt all of them. Read the question carefully, understand the question, and then attempt it.
2. Please read the complete paper before attempting any question and manage your time intelligently.
3. No additional sheet will be provided for rough work. Use the back of the last page for rough work.
4. If you need more space write on the back side of the paper and clearly mark question and part number etc.
5. After asked to commence the exam, please verify that you have ten (10) different printed pages including this title page. There are total of 5 questions.
6. Use permanent ink pens only. Any part done using soft pencil will not be marked and cannot be claimed for rechecking. Make a smiley on front page and earn four bonus marks.
7. Use **proper indentation** while writing code and make sure that your code is legible. Failing to do so can cost you marks.

	Q-1	Q-2	Q-3	Q-4	Q-5	**Total**
Marks Obtained						
Total Marks	30	30	10	10	10	**100**

Vetted By: _____Vetter Signature: _____

30

Q. No. 1

10

(a). For each expression at left, indicate its value in the right column. List a value of appropriate type. e.g., 7 for an integer, 7.0 for a real, "hello" for a String, True or Talse for a boolean or write error if there is any.

Expression	Value
3 * -1 + 7 - 5 / 2	
2 + 2 + "(2 + 2)" + 2 + (2 + 2)	
13 / 3 - 27 / 5 * 0.5 + (7.5 - 6)	
2 % 11 % 2 + 11 % 2 + 2	
(5 / 3 == 1 and 10 < 4 + 5) != false	

(b) For each run and input below, write the output that is produced.

5

```
n=input('Enter an Integer: ')
x = 1;
y = 1;
while n > y :
     x= x+1
     y = 10 * y + x
print x, ' ', y
```

Dry run:

Run 1
Enter an Integer:32
Output:

Run 2:
Enter an Integer:256
Output:

(c) What is the output of the following pseudo code:

5

```
x = 1
y = 2
n=12
while (y < n) :
    if (n % y == 0) :
        n = n / y
        x=x+1
    else :
        y=y+1

print x, ' ', n
```

Dry run:

Output:

(d) What is the output of the following pseudocode:


```
k=4
z=0
i=1
while i <= k:
    z=z+i
    i=i+1

while k >=1:
    j=1
    while j <= k:
        print z-k+j,
        j=j+1
    z=z-k
    print '\n'
    k=k-1
```

Output:

Q. No. 2

30

a) Write an if statement that assigns -20 to x when y is greater or equal to 0.

2

b) Write an if/else statement that assigns 0 to y when x is equal to "10.22". Otherwise it should assign 1 to x.

2

c) Write an if statement that assigns "Fail" to x if the variable *grade* is within the range -10 through 10 (inclusive).

2

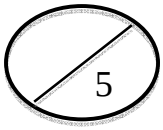
d) Write an if statement that assigns 0 to x if the variable `hours` is outside the range 10 through 60.

3

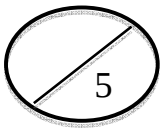
e) Write a while loop that displays the first 20 elements of the following sequence: 5, 6, 8, 11, 15, 20, 26, 33, …

5

f) Write a while loop that displays the following sequence: 256, 128, 64, 32, 16, 8, 4, 2, 1



g) Write a nested while loop that displays 5 rows of '@' characters. There should be 9 '@' characters in each row.

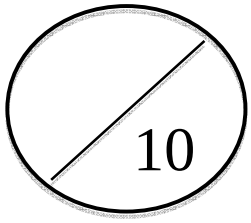


h) What will be the output of following statements, write errors if they results in syntax error. Please write your output in the second column.

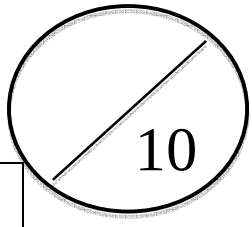
6

Code	Output
x=5 y=10 print X+y	
1j=5 y=10 print 1j + y	
z=5 w=10 print z , * , w, =, x*y	
a=10 b=20 print a++b * a--b	
cccc=10 dddd=10 print cccc---dddd++cccc	
a=90 b=90 c=80 d=81 print (a+b+c+d)/4	

Q. No. 3 Write a program that lets the user enter 10 values only once. The program should then display the largest and smallest values as well as the total number of evens and odds in the input values.

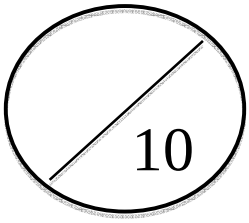


Q. No. 4 Write the code that takes length as input and prints an inclined line of that size using '*' characters. For example:



Inclined line of length 6	Inclined line of length 5

*
  *
  *
  *
  *
  *
	*
	  *
	  *
	  *
	  *



Q. No. 5 Write a program that accepts a positive integer (or string) as input and then displays a new number obtained by replacing every pair of repeated adjacent digits by a single digit. For example, the integer 558834226 has three repeated adjacent digits: 55, 88 and 22. This means that your program should display the integer 583426 instead of (558834226). You may assume that no digit is repeated more than twice.

Sample Run of Your Program:

Input	Expected Output
44223553	42353
346623	34623
121212	121212
0	0
8	8
44	4

You can also write this program using strings. If you use the strings then you should follow these guidelines.

Your program should first ask the user who many digits will be there in the input. Then repeatedly take the inputs from the user and produce a final string by concatenating the non-repeated individual digits. Remember your algorithm must replace every pair of adjacent digits input by users by a single digit.