National University of Computer & Emerging Sciences, Karachi
Spring-2019Computer Science / Software Engineering Department
Midterm 1
23ʳᵈ Sept 2019, 11:00 am – 12:00 noon

Course Code: CS118	Course Name:Programming Fundamentals
Instructor Name: Dr. Farooque/ Sir Shahzad/ Sir Shoaib/ Sir Basit	
Student Roll No:	Section No:

Instructions:

- Return the question paper and make sure to keep it inside your answer sheet.
- Read each question completely before answering it. There are **5questions and 3 pages**.
- In case of any ambiguity, you may make assumption. But your assumption should not contradict any statement in the question paper.
- You are **not allowed to write** anything on the question paper (except your ID and group).

Time: 60 minutes.   **Max Marks**: 50Marks

Q 1. Complete the missing statement(s) (where you see ----------) in the following program toobtain theoutlined output:**[10 Marks]**

```
void main() {
int cnt;char ch;
for(ch='A', cnt=1; ------; cnt++,ch++)
        {
                if(cnt<=4)
                        {
                          printf(" %c ", ch);
                        }
                else
                        {
                        ----------
                        ----------
                        }
        }
}
```

Q 2.
Output:
```
A B C D
E F G H
I J K L
```

Write on the answer sheet that following statements are TRUE or FALSE. *[1 Mark each]*

1. The default case is required in the switch selection statement.
2. The break statement is required in the default case of a switch selection statement.
3. The expression (x > y && a < b) is true if either x > y is true or a < b is true.
4. An expression containing the || operator is true if either or both of its operands is true.
5. Function printf always begins printing at the beginning of a new line.
6. Comments cause the computer to display the text after // on the screen when the program is executed.
7. The escape sequence \n when used in a printf format control string causes the cursor to position to the beginning of the next line on the screen.
8. C considers the variables *number*and *NuMbEr*to be identical.
9. All arguments following the format control string in a printf function must be preceded by an ampersand (&).
10. The arithmetic operators *, /, %, + and - all have the same level of precedence.

Q 3. Draw **PAC, IC, IPO and Flowchart** for a system, which solves following equation for **A** and print the final value. The formula required for the main equation are also given below.
[2+2+2+4 = 10 Marks]

Main equation: A= {B + 2 * (C – 7 * B) } / D

B = C + 29 * D,   C = D- 15 / 2,   D = User inputted number

Q 4. In this task, you are required to write a C program for FBR to calculate the total tax payable by a Pakistani citizen. The payment plan according to the price range of a mobile phone is listed below: **[10 Marks]**

Imported Mobiles Fixed Taxation Plan			
Mobile Price Range (PKR)	**Custom Duty**	**Sales Tax**	**Income Tax**
0-30000	1%	3%	Nil
30001-50000	4%	4%	Nil
50001-75000	8%	5%	3%
75001-90000	10%	8%	4%
90001-100000	11.50%	11%	5%
100001 & above	15%	12%	6%

Expected Input:

Enter the price of theimported mobile? 55000

Expected Output:

Custom Duty: 4400

Sales Tax: 2750

Income Tax: 1650

Total Tax payable: 8800

Q 5. Read a positive integer value from user, and compute the following sequence: If the number is even, halve it; if it's odd, multiply by 3 and add 1. Repeat this process until the value is 1, printing out each value. Finally print out how many times of these operations you performed. Example output might be: **[10 Marks]**

Initial value is 3

Next value is 10

Next value is 5

Next value is 16

Next value is 8

Next value is 4

Next value is 2

Next value is 1

Final value 1, number of steps 7

If the input value is less than 1, print a message containing the word   "Error" and perform an exit (0);

BEST OF LUCK!