

Midterm 1

23<sup>rd</sup> 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 **5 questions 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:** 50 Marks

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

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

**Output:**

```
A B C D
E F G H
I J K L
```

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

**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 & above	15%	12%	6%

**Expected Input:**

Enter the price of the imported 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!**