CS101 Spring 2023 - Theory Quiz 1 - 24 January 2024
6 Questions, 15 Marks, (Instructor: Prof. Shivaram)

Roll Number	**SAMPLE**
Name	
Group	

QNo.	Marks	Graded by	Verified By	Student's Cribs
1				
2				
3				
4				
5				
6				
Total				

Please read the following instructions carefully before you start.

- Write your roll number, name, and group number on this page in the space provided. A paper without a roll number and name will NOT be graded.
- Write your answers neatly with a blue/black pen on this question paper itself in the space provided for each question. At the end, you must submit this paper to the invigilator.
- Rough pages will NOT be provided. Use the empty space in the margins.
- Please note that your answers should NOT include any programming concept that hasn't been covered in the class so far. If such answers are found, they shall NOT be graded.
- No clarifications will be provided on any questions. When in doubt, make suitable assumptions, state them clearly, and proceed to solve the problem.
- All the best!

Q1. [1 mark - 0.5 per blank]
A CS101 student has created a file called `hello.cpp` that contains

```
#include<simplecpp>
main_program {
    cout << “Hello CS101”;
}
```

(a) Write the command to compile hello.cpp and produce an executable file.:

`s++ hello.cpp`

(b) Write the command to run the executable and view the output.:

`./a.out`

Q2. [1 mark]

Arrange the following datatypes in ascending order based on the bytes they occupy in the memory. `(a) int (b) char (c) long double (d) double`

Answer: **`(b) char (a) int (d) double (c) long double`**

Q3. [3 marks - 0.5 per blank]

Go through the program given below and write the output for each `cout` statement in the space given on the right.

`int num1 = 25, num2 = 17;`
`float num3 = 2.2, num4 = 2, num5 = 12;`
 	
`int ans1 = num1 + num2;`
`cout << ans1 << " "; // (a)`
 	
`float ans2 = num2 * num3;`
`cout << ans2 << " "; // (b)`
 	
`float ans3 = num2 / 2;`
`cout << ans3 << " "; // (c)`
 	
`float ans4 = num1 + num3 * num5 / num4;`
`cout << ans4 << " "; // (d)`
 	
`num1+=4;`
`cout << num1 << " "; // (e)`
 	
`num2--;`
`cout << num2 << " "; // (f)`
	Write the output below
	
	(a) **42**
	
	(b) **37.4**
	
	(c) **8**
	
	(d) **38.2**
	
	(e) **29**
	
	(f) **16**

Q4. [2 marks - 1 per blank]

Go through the program given below and write the output for each `cout` statement in the space given on the right.

`int num1 = 7;`
 	
`repeat(1) {`
 	
`    int num1 = 4;`
`    num1 = num1 - (num1/2) - 1;`
 	
`    cout << num1 << " "; // (a)`
 	
`}`
 	
`cout << num1;  // (b)`
	Write the output below
	
	(a) **1**
	
	(b) **7**

Q5. [3 marks]

Go through the program given below. It has syntax errors. Identify the errors and for each error that you identify, in that line, write the correct syntax.

- **0.5 marks for each error. There are 5 errors.**
- **Give 3 marks, if all 5 errors are identified and correct syntax is written.**
- **No negative marks if unnecessary errors are pointed out**
- **Ignore if the student has re-written the entire code. Only check the lines that have errors, as mentioned below.**

Line No.	Program	Identify the line having an error and write the correct syntax
1	`#include<simples++>`	`#include<simplecpp>`
2	`main_program {`	
3	`    const int cnt = 0;`	`int cnt = 0; // Cannot use const as cnt is being modified later in the program or error should be mentioned in Line 7`
4	`    float US$ = 300;`	Give 0.5 marks if the student points out the error as $ cannot be used in variable names and writes float US = 300 or float US_dollar = 300, etc. No negative marking if this is not pointed out by the student.
5	`    float INR;`	
6	`    int N;`	
7	`    cout >> "Enter N";`	`    cout << "Enter N";`
8	`    cin << N;`	`    cin >> N;`
9	`    repeat(N)`	`    repeat(N) {`
10	`        cout << cnt << endl;`	
11	`        cnt = cnt + 2;`	`Cannot increment cnt as it is declared as const in Line 3 or error should be mentioned in Line 3`
12	`    }`	
13	`}`	

Note: the Line No. 4: **`float US$ = 300;`**

In earlier versions of C++, $ was not considered a valid character while naming variable in C++. However, the newer version of C++ introduced $ as a valid character, and thus, one can use $ in naming variables. If you have an older version, the program will give a compilation error. However, the newer version will not.

Q6. [5 marks]

Have a look at the series given below. Based on the number of terms '**n**', in the series, the code snippet given below intends to compute the series i.e. the sum of the first **n** terms. Fill in the blanks to achieve it.

$$1 - \frac{1}{2} + \frac{1}{3} - \frac{1}{4} + \frac{1}{5} - \ldots.$$

Example:

- If n = 3, sum = 1
- If n = 2, sum = 0.5, as the series is: $1 - \frac{1}{2}$
- If n = 3, sum = 0.8333, as the series is: $1 - \frac{1}{2} + \frac{1}{3}$

```
int n, cnt = 1;

double sum = 0 or 0.0;                    // 1 mark

int sign = 1;                             // 1 mark

cout << "number of terms: ";
cin >> n;
repeat(n) {

    sum = sum + (sign * (1.0 / cnt));     // 2 marks
    // If the student writes 1 instead of 1.0 then give 1 mark
    // OR
    // sum = sum + sign / cnt; (Gets 1 mark, as sign/cnt
    //                          division will yield an integer)
    //                         If typecasting done then 2 marks

    sign *= -1;

    cnt = cnt + 1;                        // 1 mark
}

cout << sum << endl;
```