DAIICT – Mid-Semester Examination – Autumn 2022
IT603 – Programming

MM: 20 Time: 90 mins

DAIICT ID: ……..

NAME: ……..

Instructions:

1. There are 5 questions in this paper. Marks for each question are mentioned against it.
2. The answers must be written in the question paper itself in the space provided below every question.
3. Work on your solution in the supplementary sheet provided and write your final program as your answer in this paper.
4. To make it simpler, some questions have hardcoded data to work on. But your program logic should not assume hardcoded data and should work on data input in similar format.
5. Using modern C++ features carries marks.
6. Wherever required, you can write answer programs in a function with assumption that the main() function is calling the function you are writing.
7. You can assume appropriate headers included ie you do not need to write `#include` statements

Q1. Use range based for loop in program which uses the following array and updates it such that the even numbers get doubled, but no change is done to odd numbers.

```
int arr[] { 10, 21, 13, 34, 50, 65, 72 };
```

Then, use another range based for loop to print the `arr` array to console. The output when this program is run should look like:

```
20 21 13 68 100 65 144
```

(2+2 = 4)

Q2. Complete the following function for bitwise operations according to the comments provided.

```
typedef unsigned int uint     // use uint as alias of unsigned int type
void bitwiseTest ()
{
      uint op{0b0111'0101'1010'0101};

      cout << op << endl;
```

```
        uint bitVal{0};
        uint bcv{0};
        uint pos{0};


        // read the state of 3rd bit (2nd index) into bitVal

        // <write code>



        cout << bitVal << endl;
        bitVal = pos = bcv = 0;

        // set 10th bit

        // <write code>



        cout << op << endl;
        bitVal = pos = bcv = 0;

        // reset 6th bit

        // <write code>



        cout << op << endl;
}
```

(3)

Q3. Write a function `CopyRightAligned` to copy strings from following array named `input` to another 2-d array named `dest` (of same size), but the strings should be copied as right aligned in target array (ie all spaces, if any, of a row should be in front and string's null character should be in the last cell of its row). The `input` and `dest` arrays are in the `main` and **passed by reference** to the `CopyRightAligned` function as arguments. Feel free to use string library function. You can also opt for character wise copy.

```
char input[][50] {"Bigger than medium",
        "Small",
        "This is longest string of all",
        "Medium string"};
```

(5)

Q4. Write a program to count the number of words in a sentence. You do not need to take input from user. Use the following hard-coded string and print the result to console. The program should not count extra spaces eg. around word “one” in the input example below.
For simplicity, assume that you do not need to deal with sentences with leading/trailing spaces.

```
char s[] { "The multi-word sentence could have more than  one  spaces
between words"};
```
(4)

Q5. Complete the following program. It copies characters from str to dest, but while doing so it divides the dest in two parts (separated by a pipe '|' character). The first part contains only vowel characters that occur in str, and second part contains non-vowel characters (including space, if any). In the example string "An Advantage" in code below, if the dest is printed to console at the end of this program, it will output something like: (4)

```
AAaae|gtnvd n
```

```
void main()
{
  char str[100] = "An Advantage";
  char dest[100] = {};
```

```
  std::cout << dest << std::endl;
}
```