Submission: Wednesday, 18 September, 2024 by 11:59 pm
(**Hand-written** answers with **screenshot** of output - Submit in **ELMS**)

Q.1 Write a **C program** to print the following **pattern**. Take **n** as user input where n = **LAST_2_DIGITS_OF_YOUR_ ID % 6**. **[5]**

Sample input	n=5
Sample output	1 1 3 1 3 5 1 3 5 1 1 3 5 1 3

[In **Q.2** to **Q.4,** Show the **manual tracing** for each of the programs (assume they are syntactically correct) given below. In the programs, **LAST_FOUR_DIGITS_OF_YOUR_STUDENT_ID** (or some other variations) are used. For example, your STUDENT ID is 0112330347 and therefore, the value of LAST_ THREE_DIGITS_OF_YOUR_STUDENT_ID is 347, and you will use **347**. Below, you must put and use your own student ID in your answers.]

Q.2 Find the values of the following variables ***a, b, c, d,*** and ***e*.** **[5]**

```
int a = LAST_FOUR_DIGITS_OF_YOUR_STUDENT_ID / 7;

int b = LAST_FOUR_DIGITS_OF_YOUR_STUDENT_ID % 7;

float c = (float)LAST_FOUR_DIGITS_OF_YOUR_STUDENT_ID / 7;

float d = (float)(LAST_FOUR_DIGITS_OF_YOUR_STUDENT_ID / 7);

int e = (a-b)<0 && c;
```

Q.3 Manual trace the values of **i,** and **value_final** every time their value change**.** **[5]**

```
int n = LAST_THREE_DIGITS_OF_YOUR_STUDENT_ID % 66;

int i = 0, value_final = 0;

for( i=n-4; i <= n; i++ ){

    value_final += i*i;

    ++i;

}
```

Q.4 Show the **manual tracing** for the **array A** elements. **[5]**

```
int A[4]={0};

int i, n;

n = LAST_FOUR_DIGITS_OF_YOUR_STUDENT_ID;

for(int i=0; i<4; i++){

        A[i] = n+i;

        if(A[i]%2 != 0){

            A[i] *= 2;

        }

}
```

Q.5 Write a **C program** to perform the following operations. **[6]**

a) Assign (**LAST_TWO_DIGITS_OF_YOUR_STUDENT_ID** % 21) + **5** to integer variable *b*.

b) **Declare** a one-dimensional integer **array *A* of size 10**.

c) **Initialize** the array values with **a%7 + 3i**, Where a = **LAST_4_DIGITS_OF_YOUR_STUDENT_ID** and i = array index.

d) Find the **sum of the numbers** that are stored in **even numbered indices** in the array.

Q.6 Find the **output** of the code below for **num** = **LAST_2_DIGITS_OF_YOUR_ ID % 5**. **[2 x 4 = 8]**

a)
```
#include <stdio.h>
int main() {
      int num;
      int sum = 0, i = 1, j = 3;
      scanf("%d", &num);
      switch(num) {
            case 1:
                  sum += (i + j);
                  i++;
            case 2:
                  sum += j - 2;
                  j++;
                  break;
            case 3:
                  sum = (i + j) * i;
                  i++;
                  j--;
            case 4:
                  sum -= (i + j);
                  j--;
      }
      printf("%d %d %d", i, j, sum);
      return 0;
}
```

b) **Rewrite** the code in **Q.6(a)** by **replacing** the "**switch**" with a "**nested if…else**" statement**.** Be careful to deal with the **default case** properly.

Q.7 Manually trace the following code snippet and **find the final content** of the 2D array **arr** after the execution of the code. **[6]**

```
int arr[100][100], i, j, t1 = 0, t2 = 1, t3, x, y, z;
for(i=0; i<5; i++) {
    x = t1, y = t2, z = t1+t2;
    for(j=0; j<5; j++) {
       t3 = t1 + t2;
       arr[j][i] = t3;
       t1 = t2;
       t2 = t3;
    }
    t1 = y;
    t2 = z;
}
```