

Student Name: .....

Duration: 01.00 h

**Exercise N° 01:**

**Exam N° 01\_ Solutions**

**Question N° 01: (5 points)**

```
/* C program to find all roots of a quadratic equation */
#include <stdio.h>
#include <math.h>
int main() {
    float a, b, c;
    float root1, root2,d;
    printf("Enter values of a, b, c of q_E (aX^2 + bX + c):\n");
    scanf("%f%f%f", &a, &b, &c);
    /* Find discriminant of the equation */
    d= (b * b) - (4 * a * c);
    printf("discriminant = %.2f \n",d);
    if(d > 0) {
        root1 = (-b + sqrt(d)) / (2*a);
        root2 = (-b - sqrt(d)) / (2*a);
        printf("root1= %.2f\n root2= %.2f \n", root1, root2);
    }
    else if(d == 0) {
        root1 = root2 = -b / (2 * a);
        printf("root1= %.2f\n root2= %.2f \n", root1, root2);
    }
    else {
        printf(" No solutions !!!"); }
    return 0; }
```

**Question N° 02: (3 points)**

**a\_ RUN for  $x^2 - 5x + 6 = 0$ .**

**OUT PUT:**

Enter values of a, b, c of q\_E (aX^2 + bX + c):

1  
-5  
6  
Discriminant = 1.00  
root1= 3.00  
root2= 2.00

**b\_ RUN for  $0.2x^2 - 0.4x + 0.2 = 0$ .**

**OUT PUT:**

Enter values of a, b, c of q\_E (aX^2 + bX + c):

0.2  
-0.4  
0.2  
Discriminant = 0.00  
root1= 1.00  
root2= 1.00

## Exercise N° 02:

### Question N° 01: (5 points)

```
#include <stdio.h>
int main() {
int N, i, num;
int evenCount = 0, oddCount = 0;
//Ask the user to enter the number of integers
printf("Enter the number of integers (N): ");
scanf("%d", &N);
// Loop to read N integers
for (i = 0; i < N; i++) {
    printf("Enter integer %d: ", i + 1);
    scanf("%d", &num);
// Check if the number is even or odd
    if (num % 2 == 0) {
        evenCount++;
    } else {
        oddCount++;
    }
}
// Print the results
printf("Number of even numbers: %d\n", evenCount);
printf("Number of odd numbers: %d\n", oddCount);
return 0; }
```

### Question N° 02: (2 points)

#### OUT PUT:

```
Enter the number of integers : 10
Enter integer 1: 2
Enter integer 2: 4
Enter integer 3: 5
Enter integer 4: 8
Enter integer 5: 12
Enter integer 6: 14
Enter integer 7: 22
Enter integer 8: 35
Enter integer 9: 40
Enter integer 10: 17
Number of even numbers: 7
Number of odd numbers: 3
```

## Exercise N° 03:

### Question N° 01: (4 points)

**Purpose:** This program calculates the factorial of a number **n** entered by the user.

#### **Working:**

- The program initializes **f** and **i** to 1.
- It uses a while loop to multiply **f** by **i** iteratively until **i** reaches **n**.
- The final value of **f** is the factorial of **n**.

### Question N° 02: (1 point)

#### OUT PUT:

```
Enter the number n, n=5
5! = 120
```