1)a)

123

```
   const int MaxN = 1000;
   static void Main(string[] args)
   {
      int n;
      Console.Write("Enter the value of 'n': ");
      while (!int.TryParse(Console.ReadLine(), out n) || n <= 0 || n > MaxN)
      {
         Console.WriteLine($"Please enter a positive integer less than or equal to {MaxN}.");
         Console.Write("Enter the value of 'n': ");
      }
      int sum = 0;
      for (int i = 1; i <= n; i++)
      {
         sum += i;
      }
      Console.WriteLine($"The sum of the first {n} natural numbers is: {sum}");
   }
}
```

b) 123

```
   static void Main(string[] args)
   {
      Console.WriteLine("Enter a number:");
      int n = Convert.ToInt32(Console.ReadLine());

      Console.WriteLine($"The sum of numbers from 1 to {n} is: {SumOfSeries(n)}");
   }

   static int SumOfSeries(in int n)
   {
      int sum = 0;
      for (int i = 1; i <= n; i++)
      {
         sum += i;
      }
      return sum;
   }
}
```

2)a)

123

```
 static void Main(string[] args)
   {
      Console.WriteLine("Enter the value in kilometers:");
      double kilometers = Convert.ToDouble(Console.ReadLine());
      object boxedKilometers = kilometers; // Boxing
      double unboxedKilometers = (double)boxedKilometers; // Unboxing
      double meters = KilometersToMeters(kilometers);
      Console.WriteLine($"Value of kilometers (original): {kilometers}");
      Console.WriteLine($"Value of kilometers (unboxed): {unboxedKilometers}");
      Console.WriteLine($"Value of meters: {meters}");
   }
   static double KilometersToMeters(double kilometers)
   {
      return kilometers * 1000; // 1 kilometer = 1000 meters
   }
}
```

b)

```
using System;
class Program
{
   static void Main(string[] args)
   {
      int number = 10;
      object boxedNumber = number; // Boxing
      Console.WriteLine($"Boxed number: {boxedNumber}");
      int unboxedNumber = (int)boxedNumber; // Unboxing
      Console.WriteLine($"Unboxed number: {unboxedNumber}");
   }
}
```

4) 123

```
   static void Main(string[] args)
   {
      int billNumber;
      string clerkName;
      double totalAmount = 0;
      Console.WriteLine("Enter Bill Number:");
      billNumber = int.Parse(Console.ReadLine());
      Console.WriteLine("Enter Clerk Name:");
      clerkName = Console.ReadLine();
      Console.WriteLine("\n============================");
      Console.WriteLine($"Bill Number: {billNumber}");
      Console.WriteLine($"Clerk Name: {clerkName}");
      Console.WriteLine("============================");
      Console.WriteLine("apple-$20\norange-$30\nbanana-$40");
      string[] items = { "Item 1", "Item 2", "Item 3" };
      double[] prices = { 10.5, 20.75, 15.0 };
      for (int i = 0; i < items.Length; i++)
      {
         Console.WriteLine($"\nEnter quantity for {items[i]}:");
         int quantity = int.Parse(Console.ReadLine());
         double itemTotal = quantity * prices[i];
         Console.WriteLine($"Item: {items[i]}");
         Console.WriteLine($"Quantity: {quantity}");
         Console.WriteLine($"Price per item: {prices[i]:C}");
         Console.WriteLine($"Total cost for {items[i]}: {itemTotal:C}");
         totalAmount += itemTotal;
      }
      Console.WriteLine("\n============================");
      Console.WriteLine($"Total Amount: {totalAmount:C}");
      Console.WriteLine("============================");
   }
}
```

5) 123

```
static void Main(string[] args)
{
    int choice;
    do
    {
        Console.WriteLine("Menu:");
        Console.WriteLine("1. Option 1");
        Console.WriteLine("2. Option 2");
        Console.WriteLine("3. Option 3");
        Console.WriteLine("4. Exit");
        Console.Write("Enter your choice (1-4): ");
        if (!int.TryParse(Console.ReadLine(), out choice))
        {
            Console.WriteLine("Invalid input! Please enter a number.");
            continue;
        }
        switch (choice)
        {
            case 1:
                forloopexample();
                break;
            case 2:
                whileloopexample();
                break;
            case 3:
                dowhileloopexample();
                break;
            case 4:
                Console.WriteLine("Exiting program...");
                break;
            default:
                Console.WriteLine("Invalid choice! Please enter a number between 1 and 4.");
```

```
                break;
            }
            Console.WriteLine();
        } while (choice != 4);
    }
    static void forloopexample()
    {
        Console.WriteLine("for loop example");
        for (int i = 0; i <= 2; i++)
            Console.WriteLine(i);
    }
    static void whileloopexample()
    {
        Console.WriteLine("while loop example");
        int i = 1;
        while (i <= 5)
        {
            Console.WriteLine(i);
            i++;
        }
    }
    static void dowhileloopexample()
    {
        Console.WriteLine("do while loop example");
        int i = 1;
        do
        {
            Console.WriteLine(i);
            i++;
        } while (i <= 5);
    }
}
```

6)
```
using System;
class Program
{
   static void Main(string[] args)
   {
      Console.WriteLine("Enter age:");
      int age = int.Parse(Console.ReadLine());
      Console.WriteLine("Enter gender (male or female):");
      string gender = Console.ReadLine();
      Console.WriteLine("Enter taxable income:");
      double taxableIncome = double.Parse(Console.ReadLine());
      if (age > 65 || gender == "female")
      {
         Console.WriteLine("Wrong category.");
      }
      else if (age <= 65 && gender == "male")
      {
         double tax = 0;
         if (taxableIncome <= 160000)
         {
            tax = 0;
         }
         else if (taxableIncome > 160000 && taxableIncome <= 500000)
         {
            tax = (taxableIncome - 160000) * 0.1;
         }
         else if (taxableIncome > 500000 && taxableIncome <= 800000)
         {
            tax = (taxableIncome - 500000) * 0.2 + 34000;
         }
         else if (taxableIncome > 800000)
         {
            tax = (taxableIncome - 800000) * 0.3 + 94000;
         }
         Console.WriteLine($"Income Tax payable: {tax}");
      }
      else
      {
         Console.WriteLine("Invalid gender.");
      }
   }
}
```

7)a) 123

```
static double CalculateDiagonal(double length, double breadth)
   {
      return Math.Sqrt(length * length + breadth * breadth);
   }
   static void Main(string[] args)
   {
      Console.WriteLine("Enter the length of the rectangle:");
      double length = double.Parse(Console.ReadLine());
      Console.WriteLine("Enter the breadth of the rectangle:");
      double breadth = double.Parse(Console.ReadLine());
      double diagonal = CalculateDiagonal(length, breadth);
      Console.WriteLine($"The diagonal of the rectangle is: 
{diagonal}");
   }
}
```

b) 123

```
   static void DivideAndDisplay(int num1, int num2)
   {
      if (num1 == 0 || num2 == 0)
      {
         Console.WriteLine("Invalid entry. Cannot divide by zero.");
      }
      int larger = Math.Max(num1, num2);
      int smaller = Math.Min(num1, num2);
      double result = (double)larger / smaller;
      Console.WriteLine($"The result of dividing the larger number by the smaller number is: {result}");
   }
   static void Main(string[] args)
   {
      Console.WriteLine("Enter the first number:");
      int num1 = int.Parse(Console.ReadLine());
      Console.WriteLine("Enter the second number:");
      int num2 = int.Parse(Console.ReadLine());
      DivideAndDisplay(num1, num2);
   }
}
```