Lab manual 9 (Lab tasks):

Question 1:

```cpp
#include <iostream>
using namespace std;
int main(){
    int array[3][3], sum=0, s=0,i,j;
    cout<<"enter the elements of the array";
    for( i=0; i<3; i++){
        for( j=0; j<3; j++){
            cin>>array[i][j];
        }
    }
    for( i=0; i<3; i++){
        for( j=0; j<3; j++){
            cout<<array[i][j]<<" ";
        }

        cout<<endl;
    }
    for (i=0; i<3; i++){
        for(j=0; j<3; j++){
            if(i==j){
                sum=sum+array[i][j];
            }
        }
    }
    cout<<endl;
    cout<<"the left diagonal sum is"<<sum;
    for (i=0; i<3; i++){
        for(j=0; j<3; j++){
            if(i+j==2){
                s=s+array[i][j];
            }
        }
    }
    cout<<"the right diagonal sum is"<<s;

}
```

```
enter the elements of the array 1 2 3 4 5 6 7 8 9
1 2 3
4 5 6
7 8 9

the left diagonal sum is15the right diagonal sum is15
--------------------------------
Process exited after 4.524 seconds with return value 0
Press any key to continue . . .
```

Question 2:

```cpp
#include <iostream>
using namespace std;

const int n = 3;

void addMatrix(int arr[n][n], int array[n][n], int add[n][n]) {
    for (int i = 0; i < n; i++) {
        for (int j = 0; j < n; j++) {
            add[i][j] = arr[i][j] + array[i][j];
        }
    }
}

int main() {
    int arr[n][n], array[n][n], add[n][n];

    cout << "Enter the elements of the first array: ";
    for (int i = 0; i < n; i++) {
        for (int j = 0; j < n; j++) {
            cin >> arr[i][j];
        }
    }

    cout << "First array is:" << endl;
    for (int i = 0; i < n; i++) {
        for (int j = 0; j < n; j++) {
            cout << arr[i][j] << " ";
        }
        cout << endl;
    }

    cout << "Enter the elements of the second array: ";
    for (int i = 0; i < n; i++) {
        for (int j = 0; j < n; j++) {
            cin >> array[i][j];
        }
    }

    cout << "Second array is:" << endl;
    for (int i = 0; i < n; i++) {
        for (int j = 0; j < n; j++) {
            cout << array[i][j] << " ";
        }
        cout << endl;
    }

    addMatrix(arr, array, add);

    cout << "Sum of the two matrices is:" << endl;
    for (int i = 0; i < n; i++) {
        for (int j = 0; j < n; j++) {
            cout << add[i][j] << " ";
        }
        cout << endl;
    }

    return 0;
}
```

```
Enter the elements of the first array: 1 2 3 4 5 6 7 8 9
First array is:
1 2 3
4 5 6
7 8 9
Enter the elements of the second array: 1 2 3 4 5 6 7 8 9
Second array is:
1 2 3
4 5 6
7 8 9
Sum of the two matrices is:
2 4 6
8 10 12
14 16 18
```

Question 3:

```cpp
#include <iostream>
using namespace std;

const int n = 3;

void transpose(int arr[n][n]) {
    for (int i = 0; i < n; i++) {
        for (int j = i; j < n; j++) {
            int temp = arr[i][j];
            arr[i][j] = arr[j][i];
            arr[j][i] = temp;
        }
    }
}

int main() {
    int arr[n][n], i, j;
    cout << "Enter the elements of the array: ";
    for (i = 0; i < n; i++) {
        for (j = 0; j < n; j++) {
            cin >> arr[i][j];
        }
    }

    cout << "Entered matrix is:" << endl;
    for (i = 0; i < n; i++) {
        for (j = 0; j < n; j++) {
            cout << arr[i][j] << " ";
        }
        cout << endl;
    }

    transpose(arr);

    cout << "Transpose of the entered matrix is:" << endl;
    for (i = 0; i < n; i++) {
        for (j = 0; j < n; j++)
            cout << arr[i][j] << " ";
        cout << endl;
    }

    return 0;
}
```

```
Enter the elements of the array: 1 2 3 4 5 6 7 8 9
Entered matrix is:
1 2 3
4 5 6
7 8 9
Transpose of the entered matrix is:
1 4 7
2 5 8
3 6 9

--------------------------------
Process exited after 4.378 seconds with return value 0
Press any key to continue . . .
```

Question 4:

```cpp
#include <iostream>
using namespace std;
void multiply_matrices(int array[3][3], int array2[3][3]){
    int result[3][3];
    for(int i=0; i<3; i++){
        for (int j=0; j<3; j++){
            result[i][j]=0;
            for(int k=0; k<3; k++){
            }
            cout<<result[i][j]<<" ";
        }
        cout<<endl;
    }
}
int main(){
    int array[3][3], array2[3][3];
    cout<<"Enter elements of the first matrix";
    for(int i=0; i<3; i++){
        for(int j=0; j<3; j++){
            cin>>array[i][j];
        }
    }
    cout<<"elements for the second array";
        for(int i=0; i<3; i++){
        for(int j=0; j<3; j++){
            cin>>array2[i][j];
        }
    }
    for( int i=0; i<3; i++){
        for( int j=0; j<3; j++){
            cout<<array[i][j]<<" ";
        }

        cout<<endl;
    }
    for( int i=0; i<3; i++){
        for(int  j=0; j<3; j++){
            cout<<array2[i][j]<<" ";
        }

        cout<<endl;
    }
    cout<<endl;
    cout<<"product of matrices"<<endl;
    multiply_matrices(array, array2);
        return 0;
}
```

```
Enter elements of the first matrix1 2 3 4 5 6 7 8 9
elements for the second array1 2 3 4 5 6 7 8 9
1 2 3
4 5 6
7 8 9
1 2 3
4 5 6
7 8 9

product of matrices
0 0 0
0 0 0
0 0 0

--------------------------------
Process exited after 10.91 seconds with return value 0
Press any key to continue . . .
```

Question 5:

```cpp
#include <iostream>
using namespace std;
void table(int n, int m){
    if(m<=10){
        cout<<n<<" * "<<m<<" = "<<n*m<<endl;
        table(n,m+1);
    }
}
int main(){
    int num=15;
    cout<<"the table of the number 15 is";
    table(num, 1);
    return 0;
}
```

```
the table of the number 15 is15 * 1 = 15
15 * 2 = 30
15 * 3 = 45
15 * 4 = 60
15 * 5 = 75
15 * 6 = 90
15 * 7 = 105
15 * 8 = 120
15 * 9 = 135
15 * 10 = 150

--------------------------------
Process exited after 0.5797 seconds with return value 0
Press any key to continue . . .
```